Federal Energy Regulatory Commission
Office of Energy Projects
888 First Street, NE, Washington, DC 20426

FERC/FEIS-0267F **July 2016**

Rover Pipeline, Panhandle Backhaul, and Trunkline Backhaul Projects

Final Environmental Impact Statement

Rover Pipeline, LLC; Panhandle Eastern Pipe Line Company LP; Trunkline Gas Company, LLC

FERC Docket Nos.: CP15-93-000, CP15-94-000, and CP15-96-000

Cooperating Agencies:

U.S. Environmental Protection Agency	**U.S. Fish & Wildlife Service**	**U.S. Army Corps of Engineers**	**West Virginia Department of Environmental Protection**	**Ohio Environmental Protection Agency**

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas 4
Rover Pipeline, LLC
Rover Pipeline Project
Panhandle Eastern Pipe Line Company, LP
Panhandle Backhaul Project
Trunkline Gas Company, LLC
Trunkline Backhaul Project
Docket Nos. CP15-93-000
CP15-94-000
CP15-96-000

TO THE PARTY ADDRESSED:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared a final environmental impact statement (EIS) for the Rover Pipeline Project, Panhandle Backhaul Project, and Trunkline Backhaul Project (Projects), proposed by Rover Pipeline, LLC (Rover), Panhandle Eastern Pipe Line Company, LP (Panhandle), and Trunkline Gas Company, LLC (Trunkline), respectively, in the above-referenced dockets. Rover, Panhandle, and Trunkline request authorization to construct and operate certain interstate natural gas pipeline facilities in Michigan, Ohio, Pennsylvania, West Virginia, Indiana, Illinois, Tennessee, and Mississippi to deliver up to 3.25 billion cubic feet per day (Bcf/d) of natural gas supply from the Marcellus and Utica Shale producers in Pennsylvania, West Virginia, and Ohio through interconnections with existing pipeline infrastructure in Ohio and Michigan to supply interstate natural gas pipelines and storage facilities as well as markets in the Gulf Coast, Midwest, and Canadian regions.

The final EIS assesses the potential environmental effects of the construction and operation of the Projects in accordance with the requirements of the National Environmental Policy Act (NEPA). The FERC staff concludes that approval of the Projects would have some adverse and significant environmental impacts; however, these impacts would be reduced to acceptable levels with the implementation of Rover's, Panhandle's, and Trunkline's proposed mitigation and the additional measures recommended by staff in the final EIS.

The U.S. Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers (COE), the U.S. Fish and Wildlife Service (FWS), Ohio Environmental Protection Agency (OHEPA), and the West Virginia Department of Environmental Protection (WVDEP) participated as cooperating agencies in the preparation of the EIS.

Cooperating agencies have jurisdiction by law or special expertise with respect to resources potentially affected by the proposal and participate in the NEPA analysis. The COE would adopt the final EIS if, after an independent review of the document, it concludes that its comments and suggestions have been satisfied.

The final EIS addresses the potential environmental effects of the construction and operation of the following Project facilities in Michigan, Ohio, Pennsylvania, West Virginia, Indiana, Illinois, Tennessee, and Mississippi:

- 510.3 miles of new 24- to 42-inch-diameter natural gas pipeline and appurtenant facilities that include 10 new compressor stations, 21 new meter stations, 6 new tie-ins, 78 mainline valves, and 11 pig launcher and receiver facilities[1].
- modifications by Panhandle at four existing compressor stations, one interconnection, and three valve sites; and
- modifications by Trunkline at four existing compressor stations and one meter station.

The FERC staff mailed copies of the final EIS to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners and other interested individuals and groups; newspapers and libraries in the area of the Projects; and parties to this proceeding. Paper copy versions of this EIS were mailed to those specifically requesting them; all others received a CD version. In addition, the final EIS is available for public viewing on the FERC's website (www.ferc.gov) using the eLibrary link.

A limited number of copies are available for distribution and public inspection at:

Federal Energy Regulatory Commission
Public Reference Room
888 First Street NE, Room 2A
Washington, DC 20426
(202) 502-8371

Questions?

Additional information about the Projects is available from the Commission's Office of External Affairs, at **(866) 208-FERC,** or on the FERC (www.ferc.gov) using the eLibrary link. Click on the eLibrary link, click on "General Search," and enter the

[1] A pig is an internal tool that can be used to clean and dry a pipeline and/or to inspect it for damage or corrosion.

docket number excluding the last three digits in the Docket Number field (i.e., CP15-93, CP15-94, and CP15-96). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnline Support@ferc.gov or toll free at (866) 208-3676; for TTY, contact (202) 502-8659. The eLibrary link also provides access to the texts of formal documents issued by the Commission, such as orders, notices, and rulemakings.

In addition, the Commission offers a free service called eSubscription that allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to www.ferc.gov/docs-filing/esubscription.asp.

TABLE OF CONTENTS

Rover Pipeline Project, Panhandle Backhaul Project, and Trunkline Backhaul Project
Final Environmental Impact Statement

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF APPENDICES

LIST OF TABLES

LIST OF TABLES

LIST OF TABLES

LIST OF TABLES

LIST OF FIGURES

TECHNICAL ACRONYMS

$\mu g/m^3$	micrograms per cubic meter
ACHP	Advisory Council on Historic Preservation
ACP	Atlantic Coast Pipeline, LLC's Atlantic Coast Pipeline
ACR	Abandonment and Capacity Restoration
AI	Agricultural inspector
ANR East	TransCanada ANR East Pipeline Project
API	American Petroleum Institute
AQCR	air quality control region
BA	biological assessment
BCC	Birds of Conservation Concern
Bcf/d	billion cubic feet per day
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
bpd	barrels per day
Btu	British thermal unit
CAA	Clean Air Act of 1970
CCGT	combined cycle gas turbine
CEQ	Council on Environmental Quality
Certificate	Certificate of Public Convenience and Necessity
CFR	Code of Federal Regulations
CGT	Columbia Gas Transmission
CH_4	methane
CHP	combined heat and power
CMP	Construction Mitigation Plan
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalents
COE	U.S. Army Corp of Engineers
Columbia	Columbia Gas Transmission, LLC
Commission	Federal Energy Regulatory Commission
CRP	Conservation Reserve Program
CSR	Code of State Rules
CWA	Clean Water Act
dB	decibels
dBA	A-weighted sound level
DOT	U.S. Department of Transportation
Dth/d	dekatherms per day
DWWM	West Virginia's Division of Water and Waste Management
EI	Environmental Inspector
EIA	Department of Energy's Energy Information Administration
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency

TECHNICAL ACRONYMS

ESA	Endangered Species Act
EV	Exceptional Value
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FERC's Plan	FERC's Upland Erosion Control, Revegetation, and Maintenance Plan
FERC's Procedures	FERC's Wetland and Waterbody Construction and Mitigation Procedures
FSA	Farm Service Agency
FWS	U.S. Fish and Wildlife Service
g	force of gravity
GHGs	greenhouse gases
GIS	geographic information system
gpm	gallons per minute
GPS	Global Positioning System
GWP	global warming potential
HAP	hazardous air pollutants
HCA	high consequence area
HDD	Horizontal Directional Drill
HQ	High-Quality
IBA	Important Bird Area
ILEPA	Illinois Environmental Protection Agency
ILF	in lieu fee
INDEM	Indiana Department of Environmental Management
INGAA	Interstate Natural Gas Association of America
ITC	International Transmission Company
km	kilometer
L_{dn}	day-night sound level
L_{eq24}	24-hour equivalent sound level
LNG	liquefied natural gas
MAOP	maximum allowable operating pressure
MBCP	Myotoid Bat Conservation Plan
MBTA	Migratory Bird Treaty Act
mgd	million gallons per day
MichCon	Michigan Consolidated Gas Company
MIDEQ	Michigan Department of Environmental Quality
MIDNR	Michigan Department of Natural Resources
MIDOT	Michigan Department of Transportation
MINFI	Michigan Natural Features Inventory
MINHP	Michigan Natural Heritage Program
Mmcf/d	million cubic feet per day
mmt/yr	million metric tons per year
MP	milepost
MSDEQ	Mississippi Department of Environmental Quality
MVP	Mountain Valley Pipeline

TECHNICAL ACRONYMS

MW	megawatt
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
Nexus	Spectra Energy’s Nexus Gas Transmission Project
NGA	Natural Gas Act
NGL	natural gas liquid
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOAA Fisheries	National Oceanic and Atmospheric Administration's National Marine Fisheries Service
No_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
NSA	noise-sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
NWI	National Wetlands Inventory
O_3	ozone
OAC	Ohio Administrative Code
OEFFA	Ohio Ecological Food and Farm Association
OEP	Office of Energy Projects
OHDA	Ohio Department of Agriculture
OHDNAP	Ohio Division of Natural Areas and Preserves
OHDNR	Ohio Department of Natural Resources
OHDOT	Ohio Department of Transportation
OHDW	Ohio Division of Wildlife
OHEPA	Ohio Environmental Protection Agency
OHGS	Ohio Geological Society
OOGM	Office of Oil, Gas, and Minerals
OPEC	U.S. Department of Interior, Office of Environmental Policy and Compliance
OPEN	Spectra Energy Ohio Pipeline Energy Network
OTR	Ozone Transport Region
OVC	Equitrans Ohio Valley Connector
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PADOT	Pennsylvania Department of Transportation
PAFBC	Pennsylvania Fish and Boat Commission
PAGC	Pennsylvania Game Commission
Panhandle	Panhandle Eastern Pipe Line Company, LP
PASDA	Pennsylvania Spacial Data Access
Pb	lead

TECHNICAL ACRONYMS

pCi/L	picocuries per liter
PHMSA	DOT Pipeline and Hazardous Materials Safety Administration
PM	particulate matter
PM_{10}	particulate matter with a diameter of 10 microns or less
$PM_{2.5}$	particulate matter with a diameter of 2.5 microns or less
PRT	potential roost tree
PSD	Prevention of Significant Deterioration
PWS	public water supply system
REX	Rockies Express Pipeline
Rover	Rover Pipeline LLC
Rover's AIMP	Agricultural Impact Mitigation Plan
Rover's HDD Plan	Horizontal Directional Drilling Contingency Plan
Rover's Plan	Rover's Upland Erosion Control, Revegetation, and Maintenance Plan
Rover's Procedures	Rover's Wetland and Waterbody Construction and Mitigation Procedures
Rover's Traffic Plan	Residential Access and Traffic Mitigation Plan
Rover's WCP	Winter Construction Plan
Rover's Paleontological Discovery Plan	Unanticipated Discovery Plan for Paleontological Resources
Rover's Spill Procedures	Spill Prevention and Response Procedures
Rover's Unanticipated Discovery Plan	Procedures Guiding the Discovery of Unanticipated Cultural Resources and Human Remains
SDWA	Safe Drinking Water Act
SHP	Dominion Transmission, Inc.'s Supply Header Project
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SPAR Plan	Spill Prevention and Response Plan
SSA	sole source aquifer
SSURGO	Soil Survey Geographic Database
SWAP	Source Water Assessment Program
TNDEC	Tennessee Department of Environment & Conservation
tpy	tons per year
Transco	Transcontinental Gas Pipeline Company
Trunkline	Trunkline Gas Company, LLC
UEO Midstream	Utica East Ohio Midstream
USC	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
Vector	Vector Pipeline, L.P.
VOC	volatile organic compounds
WEG	wind erodibility group
WHPA	wellhead protection area
WHPP	Wellhead Protection Program

TECHNICAL ACRONYMS

WQC	Water Quality Certification
WV Energy Plan	West Virginia State Energy Plan
WVDEP	West Virginia Department of Environmental Protection
WVDHHR	West Virginia Department of Health and Human Resources
WVDNR	West Virginia Department of Natural Resources
WVDOT	West Virginia Department of Transportation
WVFO	U.S. Fish and Wildlife Service-West Virginia Field Office
WVGS	West Virginia Geological Survey
WVWDP	West Virginia Wildlife Diversity Program

TECHNICAL ACRONYMS

EXECUTIVE SUMMARY

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared this Environmental Impact Statement (EIS) to fulfill requirements of the National Environmental Policy Act of 1969 and the Commission's implementing regulations under Title 18 of the Code of Federal Regulations Part 380 (18 CFR 380). On February 23, 2015, Rover Pipeline LLC (Rover), filed an application with the FERC under Section 7(c) of the Natural Gas Act and Part 157 of the Commission's regulations to construct, install, own, operate, and maintain certain interstate natural gas pipeline facilities in Pennsylvania, West Virginia, Ohio, and Michigan. In the same month, Panhandle Eastern Pipe Line Company, LP (Panhandle) and Trunkline Gas Company, LLC (Trunkline) filed abbreviated applications with the FERC, related to Rover's application, to conduct upgrades and modifications at existing facilities in Indiana, Illinois, Tennessee, and Mississippi.

The FERC is the federal agency responsible for authorizing interstate natural gas transmission facilities under the Natural Gas Act and is the lead federal agency for preparation of this EIS in compliance with the requirements of National Environmental Policy Act. The U.S. Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers (COE), the U.S. Fish and Wildlife Service (FWS), the West Virginia Department of Environmental Protection (WVDEP), and the Ohio Environmental Protection Agency (OHEPA) participated as cooperating agencies in preparation of the EIS. A cooperating agency has jurisdiction by law or has special expertise with respect to environmental resource issues associated with a project.

PROPOSED ACTION

Rover's proposal (the Rover Pipeline Project, referred to as the Rover Project) would involve construction and operation of new 24-, 30-, 36-, and 42-inch-diameter natural gas pipeline in 510.3 miles of right-of-way and associated equipment and facilities in Pennsylvania, West Virginia, Ohio, and Michigan. Rover also proposes to construct and operate aboveground facilities including 10 new compressor stations, 21 new meter stations (11 of which would be located within the new compressor stations), 77 mainline valves, and 11 pig launchers/receivers.[1]

Panhandle's proposal (the Panhandle Backhaul Project, referred to as the Panhandle Project) would involve modification of piping at four existing compressor stations as well as modifications at three valve site locations. All proposed modifications would be to existing infrastructure to allow for bi-directional flow of natural gas through the Panhandle system as well as to establish the Panhandle-Rover Interconnect near Defiance, Ohio. The Panhandle Project would not involve construction of new pipeline or other associated facilities.

Trunkline's proposal (the Trunkline Backhaul Project, referred to as the Trunkline Project) would involve modifications of existing piping at the Johnsonville, Joppa, Dyersburg, and Independence Compressor Stations to allow for bi-directional flow of natural gas. The Trunkline Project would also include modifications of the existing Panhandle-Trunkline Interconnect through installation of valves and fittings and modification of piping within the Panhandle-Trunkline Tuscola Compressor Station, as well as construction and modifications at the existing Bourbon Meter Station.

According to Rover, the Rover Project was developed in response to stranded domestic natural gas supply from the Marcellus and Utica Shale producers in Pennsylvania, West Virginia, and Ohio to the

[1] A pig is an internal tool that can be used to clean and dry a pipeline and/or to inspect it for damage or corrosion.

Defiance Compressor Station and interconnection with Vector Pipeline, L.P., and transporting it to interconnections with the existing pipeline infrastructure in Ohio and Michigan supplying interstate natural gas pipelines and storage facilities as well as markets in the Gulf Coast, Midwest, and Canadian regions. Panhandle stated that the purpose of its Project is to construct and operate the system modifications that will allow Panhandle to meet the new demand for east-to-west transportation and still maintain its existing obligations for west-to-east contracts. Trunkline stated that the purpose of its Project is to modify and update existing facilities to provide bi-directional transmission of natural gas from the Midwest to the Gulf Coast region.

Dependent upon Commission approval, Rover, Panhandle, and Trunkline (collectively referred to as the "applicants") would seek approval to begin construction of their Projects as soon as possible upon receiving all necessary federal authorizations.

PUBLIC INVOLVEMENT

On June 26, 2014, Rover filed a request with the FERC to initiate the Commission's pre-filing process for the Rover Pipeline Project. At that time, Rover was in the preliminary design stage of the Project and no formal application had been filed with the FERC. The purpose of the pre-filing process is to encourage the early involvement of interested stakeholders, facilitate interagency cooperation, and identify and resolve issues before an application is filed. On June 27, 2014, the FERC granted Rover's request and established pre-filing docket number PF14-14-000 to place information related to the pipeline Project into the public record. The cooperating agencies agreed to conduct their environmental reviews of the pipeline Project in conjunction with the Commission's environmental review process.

On November 4, 2014, the Commission issued a *Notice of Intent to Prepare an Environmental Impact Statement for the Planned Rover Pipeline Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings*. The notice was published in the *Federal Register* on November 18, 2014, and mailed to more than 15,600 interested parties, including federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; affected property owners; other interested parties; and local libraries and newspapers. The notice briefly described the Rover Project and the EIS process, provided a preliminary list of issues identified by us[2], invited written comments on the environmental issues that should be addressed in the draft EIS, listed the date and location of 10 public scoping meetings to be held in the area of the Rover Project, and established a closing date for receipt of comments of December 18, 2014. On May 1, 2015, the Commission issued a supplemental *Notice of Intent to Prepare an Environmental Impact Statement for the Proposed Panhandle Backhaul Project and Trunkline Backhaul Project, and Request for Comments on Environmental Issues*. The notice was published in the *Federal Register* on May 7, 2015, and mailed to more than 400 interested parties.

We issued a *Notice of Availability of the Draft Environmental Impact Statement for the Proposed Rover Pipeline, Panhandle Backhaul, and Trunkline Backhaul Projects* on February 19, 2016. The draft EIS was sent to our environmental mailing list. The draft EIS was filed with the EPA and a formal notice of availability was issued in the Federal Register, which established a 45-day comment period on the draft EIS that ended on April 11, 2016. We held seven public comment meetings for the draft EIS in the Rover Project area between March and April 2016.

In response to our notices and at our public meetings, we received over 2,000 comments from landowners, public officials, non-governmental organizations, and government agencies regarding the Projects. These comments expressed concerns with the proposed location of the pipeline route, the

[2] "We," "us," and "our" refer to the environmental staff of the FERC's Office of Energy Projects.

effects of the Projects on environmental resources, and other issues including, but not limited to, waterbodies, wetlands, wildlife, vegetation, threatened and endangered species, property values, homeowner's insurance, project safety, blasting, air quality, exportation of natural gas, hydraulic fracturing, cumulative impacts, and alternatives. These comments are addressed in this EIS.

PROJECT IMPACTS AND MITIGATION

Construction and operation of the Projects could result in numerous impacts on the environment. We evaluated the impacts of the Projects, taking into consideration the applicants' proposed impact avoidance, minimization, and mitigation measures on geology, soils, groundwater, surface water, wetlands, vegetation, wildlife, fisheries, special-status species, land use, visual resources, socioeconomics, cultural resources, air quality, noise, and safety. Where necessary, we are recommending additional mitigation to minimize or avoid these impacts. Cumulative impacts of these Projects with other past, present, and reasonably foreseeable actions in the Projects' area(s) were also assessed. In section 3 of this EIS, we summarize the evaluation of alternatives to the Projects, including the no-action alternative, system alternatives, major and minor route alternatives, and aboveground facility alternatives.

Based on scoping comments, agency consultations, and our independent evaluation of resource impacts, the major issues identified in our analysis are in regard to waterbodies, wetlands, vegetation, wildlife habitat, and alternatives. Our analysis of these issues is summarized below and is discussed in detail in the appropriate resource sections in sections 3 and 4 of this EIS. Sections 5.1 and 5.2 of this EIS contain our conclusions and a compilation of our recommended mitigation measures, respectively.

Geology and Soils

The primary effect of construction of the Projects on geologic resources would be disturbances to steep topographic features found along the construction right-of-way. All areas disturbed during pipeline construction would be graded and restored as closely as possible to pre-construction contours during cleanup and restoration. Several areas along the Rover Project alignment could encounter potential landslide or subsidence hazards. Rover has conducted an analysis of the Rover Project route using aerial and ground surveys to determine areas of potential geological hazards and mitigation measures for landslides and subsidence that may be encountered during construction.

Rover performed geotechnical feasibility for all 30 proposed horizontal direction drill (HDD) locations to evaluate subsurface conditions at the proposed trenchless crossing sites and all 30 were determined to be feasible.

Flash flooding is a potential hazard in the Rover Project area. Rover has designed all waterbody crossings to minimize potential impacts from flash flooding, scouring, and high-flow velocities on the pipeline. In several areas along the pipeline route, a karst hazard may be present. Rover has also developed a general Karst Mitigation Plan to mitigate potential impacts and hazards from karst features. Additional surveys were completed in karst prone areas in 2016 to characterize the likelihood of developing sinkholes. The report identified five areas with a high likelihood of karst, and we are recommending that Rover hire a professional geologist to monitor these areas during construction.

The Projects would traverse a variety of soil types and conditions. Construction activities associated with the Projects, such as clearing, grading, trenching, and backfilling, could adversely affect soil resources by causing erosion and compaction and by introducing excess rock or fill material to the surface, which could hinder restoration of the disturbed areas. However, the applicants would implement the mitigation measures contained in the Construction Management Plans (CMPs) (Rover) and FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) (Panhandle and Trunkline) to control erosion, enhance successful revegetation, and minimize any potential adverse impacts on soil resources. Specifically, soil impacts would be mitigated through measures such as topsoil segregation, temporary and permanent erosion controls, and post-construction restoration and revegetation of construction work areas. Additionally, Rover would implement its Spill Prevention and Response Procedures (Spill Procedures) and state-specific Agricultural Impact Mitigation Plans during construction and operation to prevent and contain and, if necessary, clean up accidental spills of any material that may contaminate soils. Panhandle and Trunkline would follow the procedures put forth in its Spill Prevention and Response (SPAR) Plans.

Most impacts on soils would be temporary and short-term. Permanent impacts on soils would occur at the aboveground facilities, where the sites would be covered with gravel and converted to natural gas facility use. With Rover's implementation of its CMPs and Panhandle and Trunkline's implementation of FERC's Plan, we conclude that impacts on geological and soil resources would be adequately minimized.

Groundwater, Waterbody Crossings, Water Use, and Wetlands

None of the Projects would cross or come within close proximity of any designated sole source aquifers, and no state-designated aquifers have been identified in the Projects' area(s). The Rover Project would cross one wellhead protection area in Pennsylvania, one in West Virginia, eight in Ohio, and ten in Michigan; however, the Panhandle and Trunkline Projects would not cross any wellhead protection areas. A total of 119 public or private water supply wells would be located within 150 feet of the Rover Project. Rover has agreed to perform pre- and post-construction monitoring for well yield and water quality for private wells within 150 feet of the proposed construction workspace and within 2,000 feet of proposed HDD locations in areas of Karst terrain, and provide an alternative water source or a mutually agreeable solution in the event of construction-related impacts.

Construction activities would not significantly impact groundwater resources because the majority of construction would involve shallow, temporary, and localized excavation. These potential impacts would be avoided or further minimized by the use of construction techniques and mitigation described in in Rover's CMPs and FERC's *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures) (Panhandle and Trunkline). The applicants would prevent or adequately minimize accidental spills and leaks of hazardous materials into groundwater resources during construction and operation by adhering to its Spill Procedures (Rover) and its SPAR Plans (Panhandle and Trunkline).

Rover's proposed pipeline right-of-way would cross 864 waterbodies and 138 drainage features. Rover is proposing to use the HDD method to cross 45 waterbodies and use a dry-ditch method at 30 crossings of coldwater fishery or warmwater habitat waterbodies. Rover is also proposing to use the open-cut method to cross the remaining 927 waterbodies and drainage features. However, in order to minimize impacts on sensitive waterbodies, we are recommending that Rover cross all waterbodies designated coldwater fisheries or exceptional warmwater habitat using a dry-ditch crossing method. Use of trenchless and dry crossing methods to cross the waterbodies and drainage features, and implementation of the mitigation measures outlined in Rover's Procedures and other Project-specific plans would aid in the effective avoidance or minimization of impacts on surface water resources.

Access roads associated with Rover's Project would cross 54 waterbodies and 12 drainage features; however, all but 4 of the access roads are existing, with bridges already in place.

Construction of the Rover pipeline would impact a total of 160.0 acres of wetlands, including 33.4 acres of forested wetlands, 97.4 acres of herbaceous wetlands, and 29.3 acres of scrub-shrub wetlands. Rover would maintain a 10- and 30-foot-wide corridor in wetlands for areas of single pipeline and dual pipelines, respectively. Rover would also selectively remove trees and shrubs within 15 feet of the pipeline centerline that have large enough roots to potentially compromise the integrity of the pipeline coating, impacting a total of 71.5 acres through the operational life of the Rover Project.

Based on the avoidance and minimization measures developed by Rover, as well as COE permitting requirements and our recommendations, we conclude that impacts on groundwater, surface water, and wetland resources would be effectively minimized or mitigated, and would be largely temporary.

Vegetation, Wildlife, Fisheries, and Federally Listed and State-sensitive Species

The proposed Projects' impacts on vegetation would range from short-term to permanent due to the varied amount of time required to re-establish certain community types, as well as the maintenance of grassy vegetation within the permanent right-of-way and the conversion of aboveground facility locations to non-vegetated areas. The greatest impact on vegetation would be on forested areas because of the time required for tree regrowth to pre-construction condition. Construction in forest lands would remove the tree canopy over the width of the construction right-of-way (3,000.6 acres of upland forest), which would change the structure and local setting of the forest area. The regrowth of trees would take years and possibly decades. Moreover, the forest land on the permanent right-of-way would be permanently impacted by ongoing vegetation maintenance during operations, which would preclude the re-establishment of trees on the right-of-way. Although Rover has attempted to route its pipeline adjacent to existing disturbed areas and outside forested areas where possible, impacts on forest habitat represent a significant impact, and the migratory birds and other wildlife that use it, with forested land accounting for about 32 percent of the total Project route. Rover is developing a migratory bird conservation plan in consultation with the FWS that would include mitigation for forest habitat impacts.

The Rover Project would affect wildlife and wildlife habitats along the pipeline route and at the compressor stations. These impacts would be temporary, short-term, long-term, or permanent, depending on the habitat type impacted, proposed facility type, as well as the location of that habitat within Project workspaces. The proposed Rover Project would impact six areas located within four Important Bird Areas. Rover would minimize impacts on wildlife by collocating the proposed workspace with other existing rights-of-way (approximately 24 percent of the proposed alignment) and adhering to its CMPs.

A variety of migratory bird species, including Birds of Conservation Concern, are associated with the habitats that would be affected by the pipeline. The clearing of vegetation during the nesting season could have direct impacts on individual migratory birds. We are recommending that Rover consult with the FWS regarding measures to be included in Rover's final Migratory Bird Conservation Plan, including avoidance, minimization, and mitigation.

As noted above, Rover's proposed pipeline right-of-way would cross 864 waterbodies, 31 of which are classified as fisheries of special concern. Rover has indicated that it would cross all fisheries of special concern within state-designated dates for crossing windows. Rover has proposed to use an HDD at 45 waterbody crossings, the dry-ditch method at 30 crossings, and the open-cut (wet-ditch) method for the remaining crossings. Rover currently proposes no waterbodies classified as fisheries of special concern to be crossed by open-cut method. Due to the relatively large number of waterbodies that would be affected by open-cut crossings and the associated potential adverse impacts on aquatic resources at these sites, we are recommending Rover use dry-ditch methods instead of open-cut methods for coldwater fishery and exceptional warmwater habitat crossings, except for those already proposed for HDD. No in-stream blasting is expected to be required for any of the pipeline crossings; therefore, we do not expect any blasting-related fishery impacts. As a pre-emptive measure, Rover developed a Blasting Plan in the event that in-stream blasting becomes necessary.

Rover would use 40 waterbodies as sources of water for hydrostatic testing, none of which contain sensitive fisheries or fisheries of special concern. The Panhandle and Trunkline Projects would obtain hydrostatic test water entirely from municipal sources. Rover would minimize impacts associated with hydrostatic testing by fitting intake lines with screens to minimize the entrainment of fish, maintaining ambient temperatures, and controlling downstream flow rates to protect aquatic life. Following completion of the hydrostatic tests, Rover would discharge the test water through energy-dissipation devices to prevent erosion, stream bed scour, suspension of sediments, flooding, or excessive flows. After hydrostatic testing of the Panhandle and Trunkline Projects, water would be discharged to well-vegetated upland areas at a controlled rate. Discharge of hydrostatic test water would comply with all applicable permits, including the sampling of discharge water to document water quality at the time of discharge.

Based on Rover's consultations with the FWS and our review of existing records, 16 federally listed threatened or endangered species are potentially present in the vicinity of the Rover Project. We are requesting that the FWS consider this final EIS as the Biological Assessment for the Projects. We are recommending that Rover adhere to the FWS tree clearing windows for listed bat species. Based on our recommendations, we have determined that construction and operation of the Rover Project would have *no effect* on 3 of the species and *is not likely to adversely affect* the remaining 13 identified species. We are also recommending that Rover adhere to the FWS mitigation measures for the eastern massasauga rattlesnake, a species proposed for federal listing as threatened. Based on our recommendation and Rover's mitigation measures, we have also determined that the Rover Project is *not likely to jeopardize the continued existence* of the eastern massasauga rattlesnake or significantly impact the eastern hellbender, which is a potential candidate for listing under the Endangered Species Act. In addition, we are also recommending that Rover not begin construction until all remaining surveys and consultations with the applicable federal and state agencies are complete, and it has received written notification from the FERC to proceed. No federally listed threatened or endangered species would be affected by the Panhandle or Trunkline Projects.

Fifty-six species are state-listed as threatened, endangered, or were noted by the applicable state agencies as being of special concern. We are recommending that Rover submit the remaining surveys for state-listed species that may be present in the Project's workspaces. In consideration of these recommendations, as well as those described in the environmental analysis for federally listed species, we conclude that impacts on state-sensitive species would be avoided or adequately minimized.

Land Use and Visual Resources

Construction of the proposed Projects would impact a total of 9,995.6 acres. Approximately 85.4 percent of this acreage would be used for the pipeline facilities, including the construction rights-of-way and extra workspaces. The remaining acreage is associated with contractor yards (5.9 percent), access roads (1.3 percent), and aboveground facilities (7.4 percent). Following construction, lands outside of the permanent right-of-way, including extra workspace areas, contractor yards, and temporary access roads would be allowed to revert to their original land use type. The primary land use types impacted during construction would be forested/woodland (30.3 percent) and agriculture (53.6 percent). Open water, open land, industrial/commercial, and residential make up the remaining 16.1 percent of land types.

Operation of the Projects would permanently disturb 3,421.9 of the 9,995.6 acres impacted during construction. The easement for the new permanent Rover pipeline rights-of-way would account for 3,286.9 acres, or 96.1 percent of the acreage. The remaining 135.0 acres (3.9 percent) would be associated with aboveground facilities and access roads.

Rover has identified 65 residences within 50 feet of its proposed construction work area, 25 of which would be within the construction work area, and 4 within 10 feet. Rover has developed site-specific construction plans for all residences within 50 feet of construction work areas. Rover has indicated that it would purchase 11 of the residences within the workspace. We are recommending that Rover file landowner concurrence for all site-specific residential construction plans for residences within 10 feet of the construction work area.

Based on updated filings from Rover as well as comments received on the draft EIS, we have identified two planned developments within 0.25 mile of the Rover Project. Based on our review of the proposed plans, as well as our recommendation that Rover consult with the landowner of the commercial development parcel, we conclude that the Rover Project would not have an adverse effect on the proposed developments.

Almost 5,400 acres of agricultural land would be impacted during construction of the Projects. After issuance of the draft EIS, we received comments from the Ohio Department of Agriculture (OHDA) regarding the measures outlined in Rover's Ohio Agricultural Impact Mitigation Plan (AIMP) in comparison to the state's pipeline construction standards. Therefore, we are recommending that Rover consult with the OHDA on the Ohio AIMP and file any additional mitigation measures that may result from its discussions with the state. Additionally, we received numerous comments by landowners regarding the impacts the Rover Project would have on agricultural land. The main concerns raised by these landowners are reduced crop yields and potential impacts on drainage systems. Rover has developed state-specific AIMPs for Ohio and Michigan to minimize impacts. The plans include methods such as topsoil segregation, decompaction, and the repair and replacement of irrigation and drainage structures. In order to monitor any potential long-term effects on agricultural crop yield or drainage patterns, we are recommending that Rover develop a 5-year post-construction monitoring program to evaluate crop productivity in areas impacted by construction of the Rover Project. To mitigate impacts on drainage systems and agricultural drain tiles, Rover has hired an agricultural consultant to help develop drain tile mitigation plans for each affected parcel. Given the importance of the drain tile systems, we are further recommending that Rover file its final Drain Tile Relocation and Reclamation Plans prior to construction. Additionally, we are recommending that Rover commit to hiring local drain tile contractors to install/repair any damaged drain tiles, as well as provide information on encountered, severed, and/or damaged drain tile lines to the landowner and the local county Soil and Water Conservation District.

In general, impacts on recreational and special interest areas would be temporary and limited to the period of active construction, which typically would last several days to several weeks in any one area. These impacts would be minimized by implementation of Rover's CMPs.

The pipeline would cross several tracts of land supporting specialty crops, such as Christmas tree farms, an organic dairy farm, and a grass-fed cattle farm. Rover is coordinating with landowners to mitigate and compensate for potential impacts on these lands. If additional specialty crops are identified prior to construction, Rover would coordinate with landowners regarding mitigation and compensation. However, Rover has not provided site-specific mitigation for the crossing of the organic farm; therefore, we are recommending that Rover develop an Organic Farm Mitigation Plan. Additionally, Rover has identified a number of parcels enrolled in the Conservation Reserve Program that would be crossed by the Rover Project. Rover is continuing to consult with landowners and the local farm bureaus to identify any additional lands enrolled in this program.

Visual resources along the pipeline route are a function of geology, climate, and historical processes, including topographic relief, vegetation, water, wildlife, land use, and human uses and development. A portion of the pipeline rights-of-way (about 24.0 percent) would be installed within or parallel to existing pipeline and/or utility rights-of-way. As a result, the visual resources along collocated portions have been previously affected by other similar activities. Impacts in other areas would be greatest where a conversion from forested land to a grassy, maintained right-of-way would occur, particularly at viewing locations such as roadways.

Construction and operation of the Rover Project compressor stations and meter stations would result in a greater impact on visual resources. Construction of new aboveground facilities would result in the conversion of 107.2 acres of forest, agricultural, and open land into industrial land. Several of the facilities are within the viewshed of nearby residences. Some of these residences have existing visual buffers that would screen the view of the aboveground facilities, while others would experience altered viewsheds. Rover has developed visual screening plans for two of the compressor stations that could impact the viewsheds of several residents in the area, and we are recommending minor changes to these plans. Overall, visual impacts on residences close to the aboveground facilities would be permanent.

With adherence to its CMPs by Rover, adherence to our Plans and Procedures by Panhandle and Trunkline, our recommendations, we conclude that overall impacts on land use and visual resources would be adequately minimized.

Socioeconomics

The primary socioeconomic impacts of the Projects include population effects associated with the influx of construction workers and the impact of these workers on public services and temporary housing during construction. Secondary socioeconomic effects include increased sales and property tax revenue, job opportunities, income associated with local construction employment, increased vehicle traffic, and impacts on roads.

We received comments regarding potential adverse effects of the Rover Project on property values and insurance policies. The actual potential for these impacts would likely be highly variable. To address this issue, we are recommending that Rover document any property insurance issues and describe efforts to coordinate with the affected landowners to mitigate impacts. Based on our experience, we are not aware of instances where an interstate natural gas pipeline has resulted in significant impacts on property values.

Construction of the Projects would result in minor positive impacts from increases in construction jobs, payroll taxes, purchases made by the workforce, and expenses associated with the acquisition of material goods and equipment. Operation of the Projects would have a minor to moderate positive effect on local government tax revenues from an increase in property taxes that would be collected.

Cultural Resources

Rover conducted archival research and walkover surveys of the area of the proposed Rover Project to identify archaeological and historic aboveground resources and locations for additional subsurface testing in areas with potential for prehistoric and historic archaeological sites. Rover identified 133 historic aboveground resources within the survey area. Thirty-eight of these historic aboveground resources have been recommended as eligible for listing in the National Register of Historic Places. Rover would either avoid, or has stated that there would be no adverse effects on, these resources. If the resources are determined to be eligible and would be adversely affected, Rover would modify the Rover Project to avoid the resource or develop a treatment plan.

Rover identified 279 archaeological sites within the survey area. In West Virginia, Rover identified 14 archaeological sites. Thirteen of the sites were considered not eligible and one was unassessed and would be avoided. In Ohio, Rover identified 193 archaeological sites. Six of the sites were considered eligible. One of the six sites would be avoided by HDD, two of the sites are outside the Rover Project workspace and would be avoided, and three would be avoided by a Rover Project modification. In Michigan, Rover identified 69 archaeological sites. Ten of the sites were unassessed, and one was considered eligible. Rover would avoid these sites through Project realignment or adjustments to extra workspace. In Pennsylvania, three archaeological sites were identified, with none of the three considered eligible.

We consulted with federally recognized Native American tribes (42 associated with the Rover Project, 10 associated with the Panhandle Project, and 1 associated with the Trunkline Project) to provide them an opportunity to comment on the proposed Projects. Several tribes and organizations requested additional consultation or information. Three tribes responded with no objections to the Rover Project, six tribes responded with no objections to the Panhandle Project, and one tribe responded with no objections to the Trunkline Project.

To ensure that our responsibilities under Section 106 of the National Historic Preservation Act are met, we are recommending that Rover not begin construction until any additional required surveys are completed, survey reports and treatment plans (if necessary) have been reviewed by the appropriate parties, and we have provided written notification to proceed. Compliance with Section 106 is complete for the Panhandle and Trunkline Projects.

Air Quality and Noise

Air quality impacts associated with construction of the proposed Projects would include emissions from fossil-fueled construction equipment and fugitive dust. Such air quality impacts would generally be temporary and localized, and are not expected to cause or contribute to a violation of applicable air quality standards. Similarly, emissions associated with modifications at the existing Panhandle and Trunkline facilities would be intermittent and short-term. Once construction activities in an area are completed, fugitive dust and construction equipment emissions would subside, and the impact on air quality due to construction would go away completely. Further, construction emissions do not exceed the General Conformity thresholds in areas of degraded air quality. Therefore, we conclude that the Projects' construction-related impacts would not result in a significant impact on local or regional air quality.

The Rover Project would consist of 10 compressor stations, 21 meter stations, 77 mainline valves, and 11 pig launchers/receivers. The majority of new emissions from the Rover Project would result from operation of the 10 new compressor stations.

Emissions generated during operation of the pipeline portion of the Rover Project would be minimal, limited to emissions from maintenance vehicles and equipment and fugitive emissions (considered negligible for the pipeline). Rover submitted applications for construction and operation of each compressor station to the WVDEP, Pennsylvania Department of Environmental Protection, and OHEPA, as appropriate. The Defiance, Mainline 1, Mainline 2, Mainline 3, and Seneca Compressor Stations would require Title V permits for operation. However, all compressor stations would be minor sources with respect to Prevention of Significant Deterioration and New Source Review. All compressor engines would use oxidation catalysts for control of formaldehyde, carbon monoxide, and volatile organic compounds. Minimization of other pollutant emissions would be achieved with normal engine maintenance and the use of natural gas fuel. Modeled impacts at Rover's compressor stations were all below applicable standards. As with pipeline operations, any emissions resulting from operation of Rover's compressor stations would not result in significant impacts on local or regional air quality.

Noise Sensitive Areas (NSAs) near the construction areas may experience an increase in perceptible noise, but the effect would be temporary and local. Noise mitigation measures that would be implemented during construction include the use of sound-muffling devices on engines and installation of barriers between construction activity and NSAs. Additional noise mitigation measures could be implemented to further reduce construction noise disturbances at NSAs. Generally, nighttime noise would not increase during construction, with the exception of HDD activity. Proposed mitigation would reduce noise levels from HDD activity to below FERC's noise-level criterion restriction of 55 A-Weighted Sound Level (dBA) day-night sound level (L_{dn}). Based on modeled noise levels, mitigation measures proposed, and the temporary nature of construction, we conclude that the Projects would not result in significant noise impacts on residents and the surrounding communities during construction.

Operation of Rover's meter stations would not result in a perceptible noise increase or exceed the FERC criterion. Noise from planned or unplanned blowdown events could exceed the noise criteria but would be infrequent and of relatively short duration.

Noise impacts would result from operation of Rover's pipeline facilities, compressor stations, and meter stations. Based on the analyses conducted, mitigation measures proposed, and our recommendations, we conclude that operation of Rover's Project would not result in significant noise impacts on residents and the surrounding communities.

Reliability and Safety

The pipeline and aboveground facilities associated with the proposed Projects would be designed, constructed, operated, and maintained to meet the Department of Transportation's Minimum Federal Safety Standards in 49 CFR 192 and other applicable federal and state regulations. These regulations include specifications for material selection and qualification; minimum design requirements; and protection of the pipeline from internal, external, and atmospheric corrosion.

Rover would implement its own management plan for its pipeline facilities, which would be clearly marked at line-of-sight intervals and at other key points to indicate the presence of the pipeline. The pipeline system would be inspected to observe right-of-way conditions and identify soil erosion that may expose the pipe, dead vegetation that may indicate a leak in the pipeline, conditions of the vegetative cover and erosion control measures, unauthorized encroachment on the right-of-way such as buildings and other structures, and other conditions that could present a safety hazard or require preventive maintenance or repairs. Rover would use a Supervisory Control and Data Acquisition System that would allow for continuous monitoring and control of the Rover Project.

Rover would prepare an emergency response plan that would provide procedures to be followed in the event of an emergency that would meet the requirements of 49 CFR 192.615. The plan would include the procedures for communicating with emergency services departments, prompt responses for each type of emergency, logistics, emergency shut down and pressure reduction, emergency service department notification, and service restoration.

The Trunkline and Panhandle Projects would not require construction of any new facilities. Construction of the upgrades at the existing facilities would be performed in accordance with all applicable requirements of 49 CFR 192.

We conclude that the applicants' implementation of the above measures would protect public safety and the integrity of the proposed facilities.

Cumulative Impacts

Three types of projects (past, present, and reasonably foreseeable projects) could potentially contribute to a cumulative impact when considered with the proposed Projects. These projects include Marcellus Shale development (wells and gathering systems); natural gas facilities that are not under the Commission's jurisdiction; other FERC-jurisdictional natural gas pipelines; and unrelated actions such as residential or industrial developments, transportation projects, wind farms, and utility lines. The potential impact zone of cumulative impacts varied depending on the resource being discussed. Specifically, we included minor projects located within 0.5 mile of the proposed Rover Project area; major projects located within 10 miles of the proposed Rover Project area; major projects located within watersheds crossed by the Rover Project; and projects with potential to result in longer term impacts on air quality located within an air quality control region crossed by the proposed Rover Project.

We received comments associated with development of natural gas reserves in the Marcellus and Utica Shales. Production and gathering activities are overseen by the affected region's state and local agencies with jurisdiction over the management and extraction of the Marcellus and Utica Shale gas resources. Development of these shale resources is expected to continue in proximity to and during construction and operation of portions of the Rover Project in West Virginia, Pennsylvania, and Ohio. Although we do not examine the impacts of Marcellus and Utica Shale upstream facilities to the same extent as the Projects in this EIS, we have identified existing and proposed Marcellus Shale production facilities in proximity to the Rover Project and have considered them within the context of cumulative impacts in the Rover Project area.

Impacts associated with the proposed Projects in combination with other projects, such as residential developments, wind farms, utility lines, natural gas development, and transportation projects, would be relatively minor overall. We have included recommendations in the EIS to further reduce the environmental impacts associated with the Rover Project, as summarized in section 5.2. Additionally, Rover selected a route that collocates with existing rights-of-way where feasible. Therefore, we conclude that the cumulative impacts associated with the proposed Projects, when combined with other known or reasonably foreseeable projects, would be effectively limited.

ALTERNATIVES CONSIDERED

The no-action alternative was considered for the Projects. While the no-action alternative would eliminate the short- and long-term environmental impacts identified in the EIS, the stated objectives of the applicants' proposals would not be met.

Our analysis of system alternatives included an evaluation of whether existing or proposed natural gas pipeline systems could meet the Projects' objectives while offering an environmental advantage. There is no available and suitably located capacity for existing pipeline systems to transport the required volumes of natural gas, nor are they connected to the Rover Project's gas supply area in the Marcellus and Utica Shale regions of West Virginia, Pennsylvania, and Ohio. No existing pipeline system with the capacity to transport the contracted load connects the Marcellus and Utica Shale regions to serve the Rover Project markets. Therefore, we do not consider use of existing pipeline systems as feasible alternatives for the proposed Projects.

We evaluated major route alternatives for each of the Rover Project components. We identified a 3-mile-long section of Rover's proposed route where the alternative would result in fewer impacts by following an existing right-of-way. Therefore, we are recommending that Rover adopt this portion of the route into their proposed route. None of the remaining major route alternatives offered significant environmental advantages over the proposed pipeline route. Rover assessed numerous minor route variations over the course of the Rover Project development and indicated that, as of March 2016, Rover had adopted over 100 variations into its proposed route for various reasons including landowner requests, avoidance of sensitive resources, or engineering considerations. Of the 49 stakeholder requested variations that were filed prior to the draft EIS, Rover identified 10 where variations or route adjustments were pending surveys. Additionally, we determined that two of the requested variations that Rover denied were potentially feasible and one landowner whose concerns did not appear to be addressed by Rover's variation on his parcel. Therefore, in the draft EIS we recommended that Rover file either its final route adjustments for those 11 parcels where landowner issues were pending or unresolved or adopt a route adjustment developed by FERC staff for the 2 parcels where variations appeared feasible. In March 2016, Rover filed updates on each of the 13 parcels identified in the draft EIS. Rover has reached easement agreements with three of the landowners, and concerns for four of the landowners were addressed through reroutes or adjustments to the workspace. Rover assessed the remaining six parcels and indicated reroutes were not feasible. Based on our assessment of the remaining six parcels, we concluded that the route variations would not offer a significant environmental advantage for four of them, but we are recommending that Rover adopt route variations for the other two.

Prior to the draft EIS, Rover identified 3 residences that would be within 10 feet of (but not crossed by) the construction workspace and an additional 10 residences that would be within the construction workspace. Based on updated information filed by Rover, all but three of the residences identified in the draft EIS have been either purchased or the route has been relocated further from the residence. Rover indicated that it was still in negotiations with the remaining three landowners. Additionally, due to reroutes along the Rover Project route filed after issuance of the draft EIS, several additional residences are now crossed by the Project or within 10 feet of the workspace. Rover has indicated that it has been unable to reach an agreement on four of those parcels. Since Rover has not provided landowner concurrence for these residences, we are recommending that Rover adopt workspace modifications or a route variations for the seven residences identified as crossed or within 10 feet of construction workspace for which Rover has been unable to reach an agreement or provide documentation that Rover has reached an alternate agreement with the landowner.

Following issuance of the draft EIS, 29 stakeholders provided comments about specific impacts on their properties, stated that prior issues at their parcels remained unresolved, or requested that the FERC evaluate minor route variations that might avoid resources on their parcels. Rover agreed to accept 2 of the proposed variations, but stated it could not adopt the other requests. Based on a review of the requests we found that in addition to the two variations Rover agreed to, there were seven more reroute requests that were feasible and one where additional mitigation measures were needed. We are recommending that Rover adopt these route variations and additional mitigation measures.

We evaluated alternatives sites for two compressor stations: the Burgettstown Compressor Station and Mainline Compressor Station 2. Based on our evaluation, the alternative sites for Mainline Compressor Station 2 were not considered to offer a significant environmental advantage. For the Burgettstown Compressor Station, we found that Alternative Site 1 did offer an environmental advantage over the proposed site. However, Rover has indicated that the site is not available for purchase. While Alternative Site 1 provides an environmental advantage over the proposed Burgettstown Compressor Station site, the proposed site is environmentally acceptable and would not result in significant impacts. Because Rover is not able to obtain a mutual agreement for the land at the alternative site, we conclude that the advantaged of the alternative site do not outweigh the impact of obtaining the alternative site without landowner approval.

MAJOR CONCLUSIONS

We determined that construction and operation of the Projects would result in limited adverse environmental impacts, with the exception of impacts on forested land. This determination is based on a review of the information provided by the applicants and further developed from environmental information requests; field reconnaissance; scoping; literature research; alternatives analyses; and contacts with federal, state, and local agencies, and other stakeholders.

We conclude that approval of the Projects would result in some adverse and significant environmental impacts. Although many factors were considered in this determination, the principal reasons are:

- Rover would minimize impacts on natural and cultural resources during construction and operation of its Rover Project by implementing its Plan and Procedures; HDD Contingency Plan; state-specific Agricultural Impact Mitigation Plans; Unanticipated Discovery Plans; Spill Procedures; Blasting Plan; Winter Construction Plan; and Karst Mitigation Plan.
- Trunkline and Panhandle would minimize impacts on natural and cultural resources during construction and operation of its Trunkline and Panhandle Projects by implementing FERC's Plan and Procedures, its SPAR Plan, and its Unanticipated Discoveries Plan.
- We would complete Endangered Species Act consultations with the FWS prior to allowing any construction to begin.
- We would complete the process of complying with Section 106 of the National Historic Preservation Act and implementing the regulations at 36 CFR 800 prior to allowing any construction to begin.
- Rover would use trenchless crossing methods for several waterbodies and wetlands. Rover would be required to obtain applicable permits and provide mitigation for unavoidable impacts on waterbodies and wetlands through coordination with the COE and applicable state agencies.
- We are recommending that Rover cross coldwater fisheries using dry crossing methods.
- We are recommending that Rover finalize a Migratory Bird Conservation Plan that includes documentation of its consultation with the FWS regarding avoidance, minimization, and mitigation.
- We are recommending that Rover develop a property owner insurance tracking and mitigation plan.
- We would provide oversight of an environmental inspection and mitigation monitoring program that would ensure compliance with all mitigation measures that become conditions of the FERC authorizations and other approvals.

In addition, we developed site-specific mitigation measures that Rover should implement to further reduce the environmental impacts that would otherwise result from construction of its Rover Project. We determined that these measures are necessary to reduce the significant and adverse impacts associated with the Rover Project, and in part, are basing our conclusions on implementation of these measures. Therefore, we are recommending that these mitigation measures be attached as conditions to any authorization issued by the Commission. These recommended mitigation measures are presented in section 5.2 of the EIS.

1.0 INTRODUCTION

In February 2015, Rover Pipeline LLC (Rover) filed an application with the Federal Energy Regulatory Commission (Commission or FERC) under Section 7(c) of the Natural Gas Act (NGA) and Part 157 of the Commission's regulations to construct, install, own, operate, and maintain certain interstate natural gas pipeline facilities in Pennsylvania, West Virginia, Ohio, and Michigan. In the same month, Panhandle Eastern Pipe Line Company, LP (Panhandle), and Trunkline Gas Company, LLC (Trunkline) filed abbreviated applications with the FERC to conduct upgrades and modifications at existing facilities in Indiana, Illinois, Tennessee, and Mississippi. Rover, Panhandle, and Trunkline are seeking Certificates of Public Convenience and Necessity (Certificate), and were assigned Docket Nos. CP15-93-000, CP15-94-000, and CP15-96-000, respectively, for their applications. We[1] issued a *Notice of Application* for each Project on March 9, 2015, which were noticed in the *Federal Register* the same day.

Rover's proposal, referred to as the Rover Project, would involve the construction and operation of about 510 miles of new 24-, 30-, 36-, and 42-inch-diameter natural gas pipeline and associated equipment and facilities in Pennsylvania, West Virginia, Ohio, and Michigan. Rover also proposes to construct and operate 10 new compressor stations, 21 new meter stations, (11 of which would be located within the new compressor stations), 6 tie-ins, 77 mainline valves, and 11 pig[2] launchers/receivers.

Panhandle's proposal, referred to as the Panhandle Project, would involve modification of piping at four existing compressor stations as well as modifications at three valve site locations. All proposed modifications would be to existing infrastructure to allow for bi-directional flow of natural gas through the Panhandle system as well as to establish the Panhandle-Rover Interconnect near Defiance, Ohio. The Panhandle Project would not involve new construction of pipeline or other associated facilities.

Trunkline's proposal, referred to as the Trunkline Project, would involve modifications of existing piping at the Johnsonville, Joppa, Dyersburg, and Independence Compressor Stations to allow for bi-directional flow of natural gas. The Trunkline Project would also include modifications of the Panhandle-Trunkline Interconnect through installation of valves and fittings and modification of piping within the Panhandle-Trunkline Tuscola Compressor Station as well as construction and modifications at the existing Bourbon Meter Station.

As part of its application, Rover originally proposed an in-service date of December 2016 for the Supply Laterals and Mainlines A and B, with the Market Segment in service by June 2017. However, we acknowledge that this date is no longer feasible. The construction start date is dependent on: (1) Commission approval of the Projects (which cannot be assumed, and the timing of which cannot be presumed); (2) the applicants receiving all required federal authorizations; and (3) the applicants meeting all pre-construction conditions of an Order. The applicants would request to place the facilities into service following a FERC determination that restoration is proceeding satisfactorily. We expect that an in-service request would follow shortly after the end of construction. The proposed facilities for the Projects and their schedules are described in detail in section 2.0.

The vertical line in the margin identifies text that has been modified in this final EIS and differs materially from the corresponding text in the draft EIS.

[1] "We," "us," and "our" refer to the environmental staff of the FERC's Office of Energy Projects.

[2] A pig is an internal tool that can be used to clean and dry a pipeline and/or to inspect it for damage or corrosion.

The environmental staff of the FERC has prepared this final Environmental Impact Statement (EIS) to assess the environmental impacts associated with the construction and operation of the facilities proposed by the applicants in accordance with the requirements of the National Environmental Policy Act (NEPA). The U.S. Army Corps of Engineers (COE), U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (FWS), West Virginia Department of Environmental Protection (WVDEP), and Ohio Environmental Protection Agency (OHEPA) are participating as cooperating agencies in the preparation of the EIS.[3] The roles of the FERC and the cooperating agencies in the review process for the Projects are described in section 1.2.

1.1 PROJECT PURPOSE AND NEED

According to Rover, the Rover Project was developed in response to stranded domestic natural gas supply from the Marcellus and Utica Shale producers in Pennsylvania, West Virginia, and Ohio to the Defiance Compressor Station and interconnection with the Vector Pipeline, L.P. (Vector), and interconnections with the existing pipeline infrastructure in Ohio and Michigan supplying interstate natural gas pipelines and storage facilities as well as markets in the Gulf Coast, Midwest, and Canadian regions. More specifics are provided below. While this EIS will briefly discuss the applicants' purpose, it will not determine whether the need for the Projects exists, as this will later be determined by the Commission.

Based on information provided by Rover, Panhandle, and Trunkline, the purpose of the proposed Projects is to:

- move natural gas from producers' processing plants or interconnections in Pennsylvania, West Virginia, and Ohio to interconnections with Energy Transfer Partners, L.P.'s existing Panhandle Eastern Pipe Line and other Midwest pipeline interconnections near Defiance, Ohio; a direct connection with Vector near Howell, Michigan; and interconnections with Michigan natural gas utilities;
- transfer up to 3.25 billion cubic feet per day (Bcf/d) of natural gas supply from the Marcellus and Utica Shale producers in Pennsylvania, West Virginia, and Ohio to the Defiance Compressor Station and interconnection with Vector, and interconnections with the existing pipeline infrastructure in Ohio and Michigan supplying interstate natural gas pipelines and storage facilities as well as markets in the Gulf Coast, Midwest, and Canadian regions;
- increase the diversity of supply through the bi-directional meter stations at the Clarington Station in Switzerland, Ohio, and delivery meters at the interconnections with Rockies Express Pipeline (REX) in Marion, Ohio, and Columbia Gas Transmission (CGT) in Beech, West Virginia, to allow access to the East Coast, Gulf Coast, and Chicago markets and offset the reduction of available gas supply from traditional supply areas that historically served Ohio and Michigan;
- provide local Midwest gas consumers with access to readily available, stable, and competitively priced gas supply for local distribution companies connected to the Rover Project;
- construct and operate the system modifications that would allow Panhandle to meet the new demand for east-to-west transportation and still maintain its existing obligations from west-to-east contracts; and

[3] A cooperating agency has jurisdiction by law or special expertise with respect to environmental impacts involved with the proposal and is involved in the NEPA analysis.

- modify and update existing Trunkline facilities to provide bi-directional transmission of natural gas from the Midwest to Gulf Coast regions.

In June 2014, Rover executed binding precedent agreements[4] for the entire proposed 3.25 Bcf/d of additional firm transportation capacity. However, in January 2015, Rover reached an agreement with Vector that resulted in 100 miles of the originally proposed Project in Michigan no longer being needed. As a result, Rover currently has 0.15 Bcf/d of capacity still available that Rover anticipates would be subscribed at a later date.

We received several comments on the draft EIS questioning our acceptance of the applicants' stated purpose. The Commission does not direct the development of the gas industry's infrastructure regionally or on a project-by-project basis, or re-define an applicant's stated purpose. Various offices within the Commission analyze an applicant's filed application and stated purpose in order to disclose the impacts resulting from the proposed action to inform the decision makers. Accordingly, our role as FERC environmental staff is to evaluate the environmental impacts of projects as proposed, along with a reasonable range of alternatives.

We also received comments on the draft EIS requesting additional information regarding need of the Projects and whether it serves the public convenience and necessity. A project's need is established by the Commission when it determines whether a project is required by the public convenience and necessity. The FERC's Certificate Policy Statement provides guidance as to how the Commission evaluates proposals for new construction, as discussed below, and establishes criteria for determining whether there is a need for a proposed project and whether it would serve the public interest. The FERC environmental staff does not make that determination.

The Commission's analysis of whether a proposed project is required by the public convenience and necessity consists of three steps. The Commission's Statement of Policy on the Certification of New Interstate Natural Gas Pipeline Facilities[5] explains that in deciding whether to authorize the construction of major new pipeline facilities, the Commission must first balance the public benefits against the adverse effects on specific economic interests. If the conclusion is that the public benefits would not outweigh the adverse effects on the economic interests, the Commission will deny the proposal. If, however, the conclusion that the public benefits do outweigh the adverse effects on the economic interests, the Commission next takes a "hard look" at potential environmental impacts of the proposed action under the requirements of NEPA. If the Commission finds the potential environmental impacts to be unacceptable, it will deny authorization. If, however, the Commission determines that, based on the environmental analysis, market analysis, evaluation of rates, engineering analysis, and consideration of all comments submitted, the proposed project can be constructed and operated in an environmentally acceptable manner, the Commission will issue an Order that finds the project is required by the public convenience and necessity. That order will contain the environmental conditions the Commission deems necessary and appropriate to ensure acceptable mitigation of potential environmental harms.

In summary, if the Commission finds the proposed Projects to be environmentally unacceptable based on Commission staff-prepared NEPA documents, the Commission will not approve the Projects. If the Commission finds the Projects to be environmentally acceptable based on the NEPA documents, as well as market analysis, evaluation of rates, and engineering analysis, the Commission will approve the

---

[4] A precedent agreement is a binding contract under which one or both parties has the ability to terminate the agreement if certain conditions, such as receipt of regulatory approvals, are not met.

[5] The Policy Statement can be found on our website at http://www.ferc.gov/legal/maj-ord-reg/PL99-3-000.pdf. Clarifying statements can be found by replacing "000" in the URL with "001" and "002."

Projects, typically with conditions, provided they are otherwise required by the public convenience and necessity.

1.2 PURPOSE AND SCOPE OF THE EIS

Our principal purposes for preparing the EIS are to:

- identify and assess the potential impacts on the natural and human environment that would result from implementation of the proposed Projects;
- describe and evaluate reasonable alternatives to the proposed Projects that would avoid or substantially lessen adverse effects of the Projects on the environment while still meeting the Project objectives;
- identify and recommend specific mitigation measures, as necessary, to avoid or minimize environmental effects; and
- encourage and facilitate involvement by the public and interested agencies in the environmental review process.

The topics addressed in the EIS include alternatives; geology; soils; groundwater; surface waters; wetlands; vegetation; wildlife and aquatic resources; special-status species; land use, recreation, special interest areas and visual resources; socioeconomics; cultural resources; air quality and noise; reliability and safety; and cumulative impacts. The EIS describes the affected environment as it currently exists based on available information, discusses the environmental consequences of the proposed Projects, and compares the Projects' potential impacts to those of various alternatives. The EIS also presents our conclusions and recommended mitigation measures.

Our description of the affected environment is based on a combination of data sources, including desktop resources such as scientific literature and regulatory agency reports as well as field data collected by Rover, Panhandle, and Trunkline. Rover has field surveyed approximately 97 percent of the total Project route (approximately 498 miles). Completion of field surveys is primarily dependent upon acquisition of survey permission from landowners. If the necessary access cannot be obtained through coordination with landowners, and the proposed Projects are certificated by the FERC, Rover may use the right of eminent domain granted to it under Section 7(h) of the NGA to obtain a right-of-way. Therefore, if the Projects are certificated by the Commission, then it is likely that a portion of the outstanding surveys for Rover's Project (and associated agency permitting) would have to be completed after issuance of the Certificate. Construction and operation of the Panhandle and Trunkline Projects would take place entirely upon land owned or leased by the applicants; as such, the need for eminent domain is not anticipated for these Projects.

1.2.1 Federal Energy Regulatory Commission

The FERC is the federal agency responsible for evaluating applications filed for authorization to construct and operate interstate natural gas pipeline facilities. If the Commission determines that a project is required by the public convenience and necessity, Certificates would be issued under Section 7(c) of the NGA and Part 157 of the Commission's regulations. The Commission bases its decision concerning a proposed project not only on environmental impact but also on technical competence, financing, rates, market demand, gas supply, long-term feasibility, and other issues. As such, the FERC is the lead federal agency for the preparation of this EIS in compliance with the requirements of NEPA, the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (Title 40 Code of Federal Regulations [CFR] Parts 1500–1508), and the FERC's regulations implementing NEPA (18 CFR 380).

As the lead federal agency for the Projects, the FERC is required to comply with Section 7 of the Endangered Species Act of 1973 (ESA), the Magnuson-Stevens Fishery Conservation and Management Act, Section 106 of the National Historic Preservation Act (NHPA), and Section 307 of the Coastal Zone Management Act of 1972. These and other statutes have been taken into account in the preparation of the EIS.

1.2.2 U.S. Environmental Protection Agency

The EPA has delegated water quality certifications under Section 401 of the Clean Water Act (CWA) to the jurisdiction of individual state agencies, but the EPA may assume this authority if no state program exists, if the state program is not functioning adequately, or at the request of a state. Water used for hydrostatic testing of pipelines that is point-source discharged into waterbodies requires a National Pollutant Discharge Elimination System (NPDES) permit (Section 402 of the CWA) issued by the state, with EPA oversight. In addition, the EPA has the authority to review and veto the COE decisions on Section 404 permits. The EPA oversees the Michigan Department of Environmental Quality's (MIDEQ's) CWA Section 404 permitting in Michigan.

The EPA also has jurisdictional authority to control air pollution under the Clean Air Act of 1970 (CAA) (42 United States Code [USC] Chapter 85) by developing and enforcing rules and regulations for all entities that emit toxic substances into the air. Under this authority, the EPA has developed regulations for major sources of air pollution. The EPA has delegated the authority to implement these regulations to state and local agencies, who are also allowed to develop their own regulations for non-major sources. The EPA also establishes general conformity applicability thresholds, with which a federal agency can determine whether a specific action requires a general conformity assessment.

In addition to its permitting responsibilities, the EPA is required under Section 309 of the CAA to review and publicly comment on the environmental impacts of major federal actions, including actions that are the subject of draft and final EISs, and is responsible for implementing certain procedural provisions of NEPA (e.g., publishing the Notices of Availability of the draft and final EISs in the *Federal Register*) to establish statutory timeframes for the environmental review process.

1.2.3 U.S. Fish and Wildlife Service

The FWS has responsibilities under the ESA, Migratory Bird Treaty Act (MBTA), and the Bald and Golden Eagle Protection Act (BGEPA). The FWS also has special expertise regarding effects on fish and wildlife and other environmental values and works to conserve, protect, and recover species under the ESA.

1.2.4 U.S. Army Corps of Engineers

The COE has jurisdictional authority pursuant to Section 404 of the CWA (33 USC 1344), which governs the discharge of dredged or fill material into waters of the United States (including wetlands), except in Michigan where the COE has delegated authority to the MIDEQ; and Section 10 of the Rivers and Harbors Act (33 USC 403), which regulates any work or structures that potentially affect the navigable capacity of a waterbody. Because the COE must comply with the requirements of NEPA before issuing permits under this statute, it has elected to cooperate in the preparation of the EIS. The COE would adopt the EIS per 40 CFR 1506.3 if, after an independent review of the document, it concludes that its comments and suggestions have been satisfied.

As an element of its review, the COE must consider whether the proposed Projects represent the least environmentally damaging practicable alternative pursuant to the CWA Section 404(b)(1) guidelines. The term “practicable” means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall purposes of the Projects.

Although this document addresses environmental impacts associated with the proposed Projects as they relate to Section 404, it does not serve as a public notice for any of the COE’s permits. Rover filed an application for a Department of the Army Permit under Section 404 of the CWA on February 2, 2015.

1.2.5 Ohio Environmental Protection Agency

The OHEPA is a state agency that works to promote environmental stewardship and environmental law compliance to ensure a safe and healthy environment within the state of Ohio. The OHEPA has elected to be a cooperating agency and is assisting in the preparation of this EIS.

1.2.6 West Virginia Department of Environmental Protection

The WVDEP is a state agency responsible for implementing and enforcing West Virginia’s environmental regulations with respect to managing the state’s air, land, and water resources. The Division of Water and Waste Management’s (DWWM) mission is to preserve, protect, and enhance the state’s watersheds for the benefit and safety of all its citizens through implementation of programs controlling hazardous waste, solid waste, and surface and groundwater pollution, from any source. The DWWM may grant, grant with conditions, waive, or deny a Water Quality Certificate application under Section 401 of the CWA and operates in accordance with Section 47 CSR5A. Section 401 Water Quality Certification is required for each permit or license issued by a federal agency to ensure that projects will not violate the state’s water quality standards or stream designated uses.

In addition to serving as a regulatory role for the proposed Projects, the WVDEP has requested to be a cooperating agency in order to lend their experiences and insight with environmental impacts relative to this type of activity and provide recommendations on assessment, minimization, and mitigation of potential environmental impacts.

1.3 PUBLIC REVIEW AND COMMENT

On June 26, 2014, Rover filed a request with the FERC to implement the Commission’s pre-filing process for the Rover Pipeline Project. At that time, Rover was in the preliminary design stage of the Project and no formal application had been filed with the FERC. The purpose of the pre-filing process is to encourage the early involvement of interested stakeholders, facilitate interagency cooperation, and identify and resolve issues before an application is filed. On June 27, 2014, the FERC granted Rover’s request and established pre-filing docket number PF14-14-000 to place information related to the pipeline Project into the public record. The cooperating agencies agreed to conduct their environmental reviews of the pipeline Project in conjunction with the Commission’s environmental review process.

During the pre-filing process, Rover held 13 informational open houses between July and September 2014. The purpose of the open houses was to provide affected landowners, elected and agency officials, and the general public with information about the pipeline Project and to give them an opportunity to ask questions and express their concerns. We participated in the open houses to provide information regarding the Commission’s environmental review process to interested stakeholders and to take comments about the planned pipeline Project and the alternatives. The substantive questions and concerns raised by the public at the open houses are addressed in this EIS.

In addition, Rover established local points of contact to answer questions and provide information, established a website with information about the pipeline Project, and sent periodic update newsletters. Rover also communicated directly with certain landowners where specific issues were raised regarding individual properties.

On November 4, 2014, the Commission issued a *Notice of Intent to Prepare an Environmental Impact Statement for the Planned Rover Pipeline Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings*. The notice was published in the *Federal Register* on November 18, 2014, and mailed to more than 15,600 interested parties, including federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; affected property owners; other interested parties; and local libraries and newspapers. The notice briefly described the Rover Project and the EIS process, provided a preliminary list of issues identified by us, invited written comments on the environmental issues that should be addressed in the draft EIS, listed the date and location of 10 public scoping meetings to be held in the area of the Rover Project, and established December 18, 2014, as the closing date for receipt of comments.

We held 10 public scoping meetings to provide an opportunity for agencies, stakeholders, and the general public to learn more about the planned pipeline Project and participate in the environmental analysis by commenting on the issues to be addressed in the draft EIS. Meetings were held in November and December 2014 in the following locations:

- Toronto, Ohio on November 17;
- Paden City, West Virginia on November 18;
- Cadiz, Ohio on November 19;
- Chelsea, Michigan on November 20;
- Adrian, Michigan on December 1;
- Defiance, Ohio on December 2;
- New Washington, Ohio on December 3;
- Navarre, Ohio on December 4;
- Flint, Michigan on December 10; and
- Richmond, Michigan on December 11.

Each meeting was documented by a court reporter, and the transcripts were placed into the public record for Rover's Project.

On May 1, 2015, the Commission issued a supplemental *Notice of Intent to Prepare an Environmental Impact Statement for the Proposed Panhandle Backhaul Project and Trunkline Backhaul Project, and Request for Comments on Environmental Issues*. The notice was published in the *Federal Register* on May 7, 2015, and mailed to more than 400 interested parties, including federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; affected property owners; other interested parties; and local libraries and newspapers. The notice initiated the opening of a scoping comment period for the Panhandle Project and the Trunkline Project and established June 1, 2015, as the closing date for receipt of comments. Comments received during this period were then consolidated with previous comments received on the Panhandle and Trunkline Projects and with comments received on the Rover Project.

In addition, during the pre-filing process, we conducted conference calls on an approximately bi-weekly basis with representatives from Rover and interested agencies to discuss the pipeline Project's progress and issues. Summaries of the calls were placed into the public record.

The transcripts of the public scoping meetings, summaries of the bi-weekly conference calls, all written scoping comments, and any written comments received after the filing of the applications are part of the public record for the Projects and are available for viewing on the FERC internet website (http://www.ferc.gov).[6] On June 11, 2015, we issued a Project Update, which outlined the status of the environmental review process and included a summary of the issues identified through the scoping process. To date, we have received over 2,000 comments on the Rover Project and about 50 comments each for the Panhandle and Trunkline Projects.

We issued a *Notice of Availability of the Draft Environmental Impact Statement for the Proposed Rover Pipeline, Panhandle Backhaul, and Trunkline Backhaul Projects* on February 19, 2016. The draft EIS was filed with the EPA, and a formal notice of availability was issued in the Federal Register on February 26, 2016, indicating that the draft EIS was available. The draft EIS was mailed to 14,400 parties, including federal, state, and local agencies; elected officials; Native American tribes; newspapers; public libraries; intervenors; and other interested parties (i.e., affected landowners, miscellaneous individuals, and environmental groups who provided scoping comments or asked to remain on or be added to the mailing list). The distribution list was included as appendix A of the draft EIS. The Federal Register notice established a 45-day comment period on the draft EIS that ended on April 11, 2016. The notice described procedures for filing comments on the draft EIS and how information about the Projects could be found on the FERC's website.

We held seven public comment meetings during the draft EIS comment period in March and April 2016 at the following locations:

- Hamler, Ohio on March 21;
- Fayette, Ohio on March 22;
- Chelsea, Michigan on March 23;
- Paden City, West Virginia on April 4;
- Cadiz, Ohio on April 5;
- New Washington, Ohio on April 6; and
- Navarre, Ohio on April 7.

The meetings provided interested parties with an opportunity to present oral comments on our analysis of the environmental impacts of the Projects as described in the draft EIS. A total of 121 people commented at the meetings. In addition, we received 180 letters in response to the draft EIS. All timely environmental comments on the draft EIS have been addressed in this final EIS. A transcript of each meeting and copies of each written comment are part of the public record for the Projects. Our responses to relevant comments are provided in appendix T of this final EIS. A keyword index is provided in appendix U. Substantive changes in the final EIS are indicated by vertical bars that appear in the margins. The changes were made both in response to comments received on the draft EIS and as a result of updated information that became available after the issuance of the draft EIS.

This final EIS is being mailed to federal, state, and local agencies; elected officials; Native American tribes; newspapers; public libraries; intervenors; and other interested parties (i.e., affected

[6] Using the "eLibrary" link, select "General Search" from the eLibrary menu and enter the docket number excluding the last three digits in the "Docket Number" field (i.e., PF14-14, CP15-93, CP15-94, or CP15-96). Be sure to select an appropriate date range.

landowners, miscellaneous individuals, and environmental groups), and will be filed with the EPA for issuance of a formal public notice of availability in the Federal Register. In accordance with CEQ's regulations implementing NEPA, no agency decision on a proposed action may be made until 30 days after the EPA publishes a notice of availability for a final EIS. However, the CEQ regulations provide an exception to this rule when an agency decision is subject to a formal internal process that allows other agencies or the public to make their views known. In such cases, the agency decision may be made at the same time the notice of the final EIS is published, allowing both periods to run concurrently. Should the Commission issue Rover, Panhandle, and Trunkline Certificates for their respective actions, it would be subject to a 30-day rehearing period. Therefore, the Commission could issue its decision concurrently with issuance of the final EIS.

Table 1.3-1 lists the environmental issues that were identified during scoping and indicates the section of the EIS in which each issue is addressed. Including comments received at the public scoping meetings, nearly 2,000 written comments and over 50 motions to intervene were filed with the FERC and placed in the public record for the Projects. Table 1.3-1 also lists comments that were received after the formal scoping period closed, including the relevant environmental comments raised by individuals requesting to be interveners in the Commission's proceeding.[7] Additional issues we independently identified are also addressed in the EIS.

TABLE 1.3-1

Issues Identified and Comments Received during the Scoping Process for the Proposed Projects

Issue/Specific Comment	EIS Section Addressing Comment
General	
Project purpose and need	1.1
Coordination of the NEPA reviews by cooperating agencies	1.2
Pre-filing process, its use in Project development, agency coordination, landowner notifications and communications, public participation	1.3
Exportation of natural gas	1.3
Compliance with environmental permits	1.5
Non-jurisdictional facilities	1.4
Right-of-way width requirements and configurations	2.2.1
Depth of cover	2.3.1
Timeframe and schedule for the proposed facilities	2.4
Future Project expansion	2.7
Measures to avoid, minimize, and mitigate adverse impacts on the environment	4.0
Development of natural gas reserves in the Marcellus Shale (fracking)	4.13

[7] The FERC's *Notice of Application* (for the Rover Pipeline Project, the Panhandle Backhaul Project, and Trunkline Backhaul Project), was issued in the *Federal Register* on March 9, 2015, which opened the 21-day period for intervention. A total of 54 groups and individuals for the Rover Pipeline Project, 34 for the Trunkline Project, and 41 for the Panhandle Project requested intervener status. Interveners are official parties to the proceeding and have the right to receive copies of case-related Commission documents and filings by other interveners. Likewise, each intervener must provide a copy of its filings to the Secretary of the Commission and must send a copy of its filings to all other interveners.

TABLE 1.3-1 (continued)

Issues Identified and Comments Received during the Scoping Process for the Proposed Projects

Issue/Specific Comment	EIS Section Addressing Comment
Alternatives	
Workspace alternatives	2.3, 4.8
No action alternative	3.1
Energy conservation	3.1.1
Non-gas energy alternatives	3.1.2
Consideration of renewable energy alternatives	3.1.2
Use of other natural gas systems	3.2
Consideration of alternative routes to avoid populated areas, planned development, and critical infrastructure	3.4, 3.5
Consideration of alternative routes and construction practices to avoid sensitive resources	3.3, 3.4, 3.5, appendix I
Geology	
Potential for seismic activity (earthquakes) or landslides to affect the integrity of the pipeline after construction	4.1.3
Impacts from blasting	4.1.3
Impacts due to construction in karst terrain	4.1.3
Soils	
Contaminated soils	2.3.1, 4.2.2, 4.8.5
Soil compaction	4.2
Erosion and sediment control	4.2.1, 4.2.3, 4.2.4, 4.2.5
Water Quality and Aquatic Resources	
Storage of hazardous materials and fuel oil, and spill reporting procedures	2.3, 4.3.1, 4.3.2
Dewatering methods and procedures	2.3.1, 2.3.2, 4.2.5,
Waterbody crossing time windows, methods, mitigation, and restoration measures	2.3.2, 4.3.3, 4.6.2, appendix L
Impacts on the pipeline from a flood event	4.1.3, 4.3.3
Impacts on groundwater, existing hydrology, and drinking water supply (including public and private wells)	4.3.1
Impacts on fishery resources, including coldwater fishery streams	4.6.2
Wetlands	
Impacts on wetlands	4.4.3, appendix M
Restoration of wetlands and wetland mitigation	4.4.5
Vegetation	
Impacts on mature trees, including restoration plans	4.5.3, 4.8.1, appendix N
Revegetation of areas cleared during construction	4.5.5
Plans for invasive species control	4.5.4
Wildlife	
Timing restrictions and compliance with the Migratory Bird Treaty Act	4.6.1
Impacts on wildlife from forest fragmentation/forest edge effect	4.6.1

TABLE 1.3-1 (continued)

Issues Identified and Comments Received during the Scoping Process for the Proposed Projects

Special-Status Species	
Agency coordination and requirements	4.7.1
Evaluation of potential impacts on threatened or endangered species and their habitat	4.7.2, 4.7.3
Land Use	
Eminent domain and compensation process	4.8.2
Impacts on future development plans	4.8.3
Impacts on existing residences and structures during construction and operation	4.8.3
Compatibility with federally and state-owned lands	4.8.4
Impacts on recreational and special interest areas (including agricultural lands and organic farms)	4.8.4
Impacts on landowners from removal of lands from conservation programs with potential tax or penalty implications	4.8.4
Visual impacts of aboveground facilities	4.8.6
Impacts on transportation infrastructure (roads, highways, railroads)	2.3.2, 4.9.4, appendix G-5, appendix H
Increased impacts on landowners from trespassers and decreased privacy	4.8.3
Impacts on tourism, ecotourism, and businesses that rely on the land	4.8.4, 4.9.2
Socioeconomics	
Employment opportunities for local contractors and laborers and increased tax revenues	4.9.1, 4.9.7
Assessment of and impacts on community public safety resources	4.9.3
Traffic impacts associated with the Project	4.9.4
Impacts on Environmental Justice communities	4.9.8
Impacts on homes, businesses, and land values, potential for increased taxes and lowered property values	4.9.5, 4.9.7
Impacts on mortgage rates	4.9.5
Impacts on ability to obtain and afford homeowner’s insurance	4.9.6
Cultural Resources	
Tribal consultation and impacts on tribal lands and areas of cultural importance to Native American tribes	4.10.1
Impacts on culturally and historically significant properties	4.10.4
Air Quality	
Consistency with the emissions limits and standards	4.11.1
Impacts on air quality resulting from construction activities	4.11.1
Methane leaks and greenhouse gas emissions	4.11.1
Noise	
Potential noise impacts resulting from construction activities and proposed mitigation measures to reduce impacts	4.11.2
Reliability and Safety	
Emergency response plans, evacuation plans, and coordination with community public safety services	4.8.5, 4.12.1
Remote detection of potential issues (e.g., pipeline leaks), safety of pipeline operation	4.12.1
Safety and reliability of constructing and maintaining the pipeline	4.12.1

TABLE 1.3-1 (continued)	
Issues Identified and Comments Received during the Scoping Process for the Proposed Projects	
Pipeline damage from accidental third-party or terrorist actions	4.12.1
Cumulative Impacts	
Analysis of cumulative impacts	4.13

During the pre-filing period, we received over 700 comments regarding potential impacts on the Market Segment portion of the Rover Project, which at the time included 209 miles of right-of-way starting in Defiance County, Ohio, and terminating in St. Clair County, Michigan. However, in January 2015, Rover reached an agreement with Vector that resulted in the Market Segment terminating at an interconnection with the Vector Pipeline in Livingston County, Michigan. This resulted in the proposed Market Segment being reduced by 109 miles to a total length of about 100 miles and removal of five Michigan counties from the Rover Project area.

Several of the issues identified both during and after the pre-filing process involved alternative pipeline routes prompted by localized resources such as water wells or wetlands, as well as larger resource areas such as aquifers, watersheds, and other environmentally sensitive areas (e.g., natural habitat management areas or designated scenic areas). These concerns were identified by property owners, stakeholders, the FERC staff, and other agency staff. Many of these alternative routes that avoided sensitive resources were developed early in the process and voluntarily incorporated by Rover into its proposed route. Given this process, subsequent alternative route comparisons often were not necessary if the resource was avoided or the stakeholder's concerns were otherwise resolved. Other alternative routes, however, both small and large, remained viable throughout the course of the Rover Project. Section 3.0 presents our analysis of all the alternatives that were identified since the beginning of our review of these Projects in July 2014. This section also discusses the original routes that were discarded in favor of routes voluntarily incorporated by Rover to reduce impacts on specific resources.

We also received scoping comments regarding the potential for overseas exportation of natural gas associated with the Rover Project. Rover has stated that it would supply natural gas from the Marcellus and Utica Shale Regions to serve markets in the Gulf Coast, Midwest, and Northeast United States, as well as markets in Canada.

1.4 NON-JURISDICTIONAL FACILITIES

Under Section 7 of the NGA, the FERC is required to consider, as part of its decision to authorize interstate natural gas facilities, all factors bearing on the public convenience and necessity. Occasionally, proposed projects have associated facilities that do not come under the jurisdiction of the Commission. These "non-jurisdictional" facilities may be integral to the need for the proposed facilities (e.g., a power plant at the end of a FERC-jurisdictional pipeline); or they may be merely associated as minor, non-integral components of the jurisdictional facilities that would be constructed and operated as a result of certification of the proposed facilities.

Rover has determined that electric power would need to be supplied to three proposed aboveground facilities where power is not readily available and that new powerlines would need to be installed at these facilities. Rover has proposed two access roads with a width of 75 feet each that would encompass the need for the powerlines. Therefore, impacts from the non-jurisdictional powerlines have been accounted for in the Rover Project impacts.

Commentors recommended that the impacts associated with producing natural gas from the Marcellus Shale be included in the environmental review of the Rover Project. Our authority under the NGA and the NEPA review requirements relate only to natural gas facilities that are involved in interstate commerce. Thus, the facilities associated with the production of natural gas are not under FERC's jurisdiction. The development of the Marcellus Shale, which is regulated by the states, continues to drive the need for takeaway interstate pipeline capacity to allow the gas to reach markets. Therefore, companies are planning and building interstate transmission facilities in response to this new source of gas supply. In addition, many production facilities have already been permitted and/or constructed in the region, creating a network through which natural gas may flow along various pathways to local users or interstate pipeline systems.

That is not to say that the environmental impact of individual production facilities is not assessed. The permitting of oil and gas production facilities is under the jurisdiction of other agencies, such as the COE or state agencies. Although we do not examine the impacts of Marcellus Shale production facilities to the same extent as the Project facilities in this EIS, we have identified existing and proposed Marcellus Shale production facilities in proximity to the Rover Project and have considered them within the context of cumulative impacts in the Rover Project area (see section 4.13, Cumulative Impacts).

1.5 PERMITS, APPROVALS, CONSULTATIONS, AND REGULATORY REVIEW

Table 1.5-1 lists the major federal, state, and local permits, approvals, and consultations identified for the construction and operation of the Projects. Table 1.5-1 also provides the dates or anticipated dates when Rover, Panhandle, and Trunkline commenced or anticipate commencing formal permit and consultation procedures. Rover, Panhandle, and Trunkline would be responsible for obtaining all permits and approvals required to implement the proposed Projects prior to construction regardless of whether they appear in this table.

TABLE 1.5-1

Major Permits, Approvals, and Consultations Applicable to the Proposed Projects a

Agency	Permit/ Approval/ Consultation	Agency Action	Rover Project Status	Panhandle Backhaul Project Status	Trunkline Backhaul Project Status
Federal					
FERC	Certificate of Public Convenience and Necessity	Determine whether the proposed project is in the public interest, and consider issuance of a Certificate.	Application under review (filed February 2015).	Application under review (filed February 2015).	Application under review (filed February 2015).
COE	Section 404, CWA Permit and Section 10	Issuance of a Section 404 Permit for discharges of dredged or fill material into waters of the United States, including jurisdictional wetlands.	Application under review (filed February 2015).	Not Applicable.	Not Applicable.

TABLE 1.5-1 (continued)

Major Permits, Approvals, and Consultations Applicable to the Proposed Projects a

Agency	Permit/ Approval/ Consultation	Agency Action	Rover Project Status	Panhandle Backhaul Project Status	Trunkline Backhaul Project Status
	Section 408	Issuance of a Section 408 Permit for alteration or occupation or use of a COE civil work project.	Application under review (filed April 2016).	Not Applicable.	Not Applicable.
	Rivers and Harbors Act Section 10 Permit	Issuance of a Section 10 Permit for disturbances of soils/sediment or modifications of navigable waters of the United States.	Application under review (filed February 2015).	Not Applicable.	Not Applicable.
EPA	Section 404, CWA	Delegated to MIDEQ; review Project and provide comments to MIDEQ regarding Section 404/ 401 of CWA.	Application under review (filed February 2015).	Not Applicable.	Not Applicable.
U.S. Forest Service, Wayne National Forest	Evaluation of Project crossing over Forest Service (USFS) boundary	Provided comments to prevent crossing into USFS-owned land.	Consultation is complete; no USFS-owned lands are crossed.	Not Applicable.	Not Applicable.
U.S. Department of Transportation Federal Highway Administration National Scenic Byways Program	Title 23, 162 USC	Provide comments to prevent crossings of America's scenic byways.	Application under review (filed February 2015).	Not Applicable.	Not Applicable.
FWS	Section 7 ESA consultation, Biological Opinion	Finding of impacts on federally listed or proposed species. Provide Biological Opinion if the Project is likely to adversely affect federally listed or proposed species or their habitats.	Consultation initiated June 25, 2014; ongoing.	Consultation initiated on December 17, 2014 (Responses for Michigan, Ohio, and Illinois field offices received January 10, 2015; response is pending for the Indiana field office).	Consultation initiated on December 22, 2014; response is pending.
	Migratory Bird Treaty Act	Provide comments to prevent taking or loss of habitat for migratory birds.	Consultation initiated June 25, 2014; ongoing.	Not Applicable.	Not Applicable.
	Bald and Golden Eagle Protection Act	Provide comments to prevent taking or loss of habitat for bald and golden eagles.	Consultation initiated June 25, 2014; ongoing.	Not Applicable.	Not Applicable.

TABLE 1.5-1 (continued)

Major Permits, Approvals, and Consultations Applicable to the Proposed Projects a

Agency	Permit/ Approval/ Consultation	Agency Action	Rover Project Status	Panhandle Backhaul Project Status	Trunkline Backhaul Project Status
State of Pennsylvania					
Pennsylvania Department of Environmental Protection Southwest (Pittsburgh) Regional Office	Erosion and Sediment Control General Permit	Issue Erosion and Sediment Control General Permit.	Application under review (submitted January 2016).	Not Applicable.	Not Applicable.
	BDWM GP-8 Temporary Road Crossing Permit	Issue permit for temporary road crossings in Pennsylvania.	Application under review (submitted January 2016).	Not Applicable.	Not Applicable.
	BDWM GP-5 Utility Line Crossing Permit	Issue permit for utility line stream crossings.	Application under review (submitted January 2016).	Not Applicable.	Not Applicable.
	NPDES – Hydrostatic Test Water Discharge Permit/Approval	Issuance of general permit for discharges from hydrostatic testing.	Application to be submitted October 2016.	Not Applicable.	Not Applicable.
	Air Permit	Issue permit for construction and operation of source air pollutant emissions.	Application under review (filed February 2015).	Not Applicable.	Not Applicable.
Pennsylvania Department of Conservation and Natural Resources Bureau of Recreation and Conservation	State-listed species consultation	Provide comments to prevent impacts on state-listed species.	Consultation initiated on June 25, 2014; ongoing.	Not Applicable.	Not Applicable.
Pennsylvania Fish and Boat Commission	State-listed species consultation	Provide comments to prevent impacts on state-listed species.	Consultation initiated on June 25, 2014; ongoing.	Not Applicable.	Not Applicable.
Pennsylvania Game Commission	State-listed species consultation	Provide comments to prevent impacts on state-listed species.	Consultation initiated on June 25, 2014; ongoing.	Not Applicable.	Not Applicable.
Pennsylvania Historical and Museum Commission	NHPA, Section 106	Review and comment on the Project and its effects on historic properties.	Consultation initiated on June 25, 2014; responses dated February 26, 2015, March 17, 2015, January 15, 2016, and January 21, 2016; ongoing.	Not Applicable.	Not Applicable.

TABLE 1.5-1 (continued)

Major Permits, Approvals, and Consultations Applicable to the Proposed Projects a

Agency	Permit/ Approval/ Consultation	Agency Action	Rover Project Status	Panhandle Backhaul Project Status	Trunkline Backhaul Project Status
State of West Virginia					
WVDEP Division of Water and Waste Management	Water Quality Certification (WQC), Section 401	Review and issuance of WQC.	Application under review (submitted in April 2016).	Not Applicable.	Not Applicable.
	NPDES Construction Stormwater General Permit	Issue NPDES Construction Stormwater General Permit.	Application to be submitted June 2016.	Not Applicable.	Not Applicable.
	Hydrostatic Test Water Discharge Permit	Issue hydrostatic testing general permit.	Application to be submitted October 2016.	Not Applicable.	Not Applicable.
WVDEP Division of Air Quality	Air Permit	Issue permit for construction and operation of source air pollutant emissions.	Application under review (submitted in February 2015).	Not Applicable.	Not Applicable.
West Virginia Division of Natural Resources Office of Land and Streams	Waterbody Crossing Permits	Issue permits for waterbody crossings.	Application to be submitted June 2016.	Not Applicable.	Not Applicable.
West Virginia Division of Culture and History	NHPA, Section 106	Review and comment on the project and its effects on historic properties.	Consultation initiated on June 25, 2014; response dated February 25, 2015; ongoing.	Not Applicable.	Not Applicable.
State of Ohio					
OHEPA, Division of Surface Water	WQC, Section 401	Review and issuance of WQC.	Application under review (submitted in November 2015).	Not Applicable.	Not Applicable.
	Isolated Wetland Permits	Issue isolated wetland permit for discharge dredged or fill material into isolated wetlands.	None required to date.	Not Applicable.	Not Applicable.
	NPDES Construction Stormwater Permit	Issue NPDES Construction Stormwater General Permit.	Application estimated to be submitted June 2016.	Application to be submitted at least 30 days prior to construction start.	Not Applicable.

TABLE 1.5-1 (continued)

Major Permits, Approvals, and Consultations Applicable to the Proposed Projects a

Agency	Permit/ Approval/ Consultation	Agency Action	Rover Project Status	Panhandle Backhaul Project Status	Trunkline Backhaul Project Status
	Hydrostatic Test Water Discharge Permit	Issue hydrostatic test water general permit.	Application to be submitted October 2016.	Not Applicable.	Not Applicable.
Division of Air Pollution Control	Air Permit	Issue permit for construction and operation of source air pollutant emissions.	Application under review (filed February 2015).	Not Applicable.	Not Applicable.
Ohio Department of Natural Resources	State-listed species consultation	Provide comments to prevent impacts on state-listed species.	Consultation initiated on June 25, 2014; ongoing.	Consultation initiated on December 17, 2014; response received in February 2015.	Not Applicable.
Ohio State Historic Preservation Office Resource Protection and Review	NHPA, Section 106	Review and comment on the Project and its effects on historic properties.	Consultation initiated on June 25, 2014; ongoing.	Consultation initiated on December 17, 2014; response dated February 23, 2015. Consultation complete.	Not Applicable.
Stark County Park District	Consultation for Project crossing of the Ohio and Erie Canalway at the Tuscarawas River	Provide comments to minimize impacts on the Ohio and Erie Canalway.	Consultation initiated on June 25, 2014; ongoing.	Not Applicable.	Not Applicable.
State of Michigan					
MIDEQ Water Resources Division Lansing District Office and Jackson District Office	Sections 401 and 404, CWA	Review and issuance of WQC and 404 permit.	Application under review (submitted in February 2015).	Not Applicable.	Not Applicable.
	Part 301, Inland Lakes and Streams Permit and Part 303, Wetland Permit	Issue Part 301 and Part 303 Permits.	Application under review (submitted in February 2015).	Not Applicable.	Not Applicable.
	Soil Erosion and Sedimentation Control Approval	Issue soil erosion and sediment control permit.	Application to be submitted June 2016.	Not Applicable.	Not Applicable.
	Water Withdrawal Permit	Issue a water withdrawal permit.	Application to be submitted July 2016.	Not Applicable.	Not Applicable.
	Groundwater (Hydrostatic) Discharge Permit	Issue hydrostatic test general permit.	Application to be submitted July 2016.	Not Applicable.	Not Applicable.

TABLE 1.5-1 (continued)

Major Permits, Approvals, and Consultations Applicable to the Proposed Projects a

Agency	Permit/ Approval/ Consultation	Agency Action	Rover Project Status	Panhandle Backhaul Project Status	Trunkline Backhaul Project Status
	NPDES Construction Stormwater General Permit	Issue NPDES Construction Stormwater General Permit.	Not Applicable.	Application to be submitted at least 30 days prior to construction start.	Not Applicable.
Michigan Department of Natural Resources	State-listed species consultation	Provide comments to prevent impacts on state-listed species.	Consultation initiated on June 25, 2014; ongoing.	Consultation initiated on December 17, 2014; response is to be determined.	Not Applicable.
	Pinkney State Recreation Area crossing consultation	Provide comments to minimize impacts on state special interest and recreation areas.	Consultation initiated on June 25, 2014; ongoing.	Not Applicable.	Not Applicable.
	Holly State Recreation Area crossing consultation	Provide comments to minimize impacts on state special interest and recreation areas.	Consultation initiated on June 25, 2014; ongoing.	Not Applicable.	Not Applicable.
	Horseshoe Lake State Game Area crossing consultation	Provide comments to minimize impacts on state special interest and recreation areas.	Consultation initiated on June 25, 2014; ongoing.	Not Applicable.	Not Applicable.
	Polly Ann Trail crossing consultation	Provide comments to minimize impacts on state special interest and recreation areas.	Consultation initiated on June 25, 2014; ongoing.	Not Applicable.	Not Applicable.
Michigan State Housing Development Authority Historic Preservation	NHPA, Section 106	Review and comment on the Project and its effects on historic properties.	Consultation initiated on June 25, 2014; ongoing.	Consultation initiated on December 17, 2014; response dated February 18, 2015. Consultation complete.	Not Applicable.

TABLE 1.5-1 (continued)					
Major Permits, Approvals, and Consultations Applicable to the Proposed Projects a					
Agency	**Permit/ Approval/ Consultation**	**Agency Action**	**Rover Project Status**	**Panhandle Backhaul Project Status**	**Trunkline Backhaul Project Status**
State of Indiana					
Indiana Department of Natural Resources, Division of Historical Preservation and Archaeology	NHPA, Section 106	Review and comment on the Project and its effects on historic properties.	Not Applicable.	Consultation initiated on December 17, 2014; response dated January 19, 2015. Consultation complete.	Not Applicable.
Indiana Department of Natural Resources, Division of Water	State-listed species consultation	Provide comments to prevent impacts on state-listed species.	Not Applicable.	Consultation initiated on December 17, 2014; response received December 29, 2014.	Not Applicable.
Indiana Department of Environmental Management	NPDES Construction Stormwater General Permit	Issue NPDES Construction Stormwater General Permit.	Not Applicable.	Application to be submitted at least 30 days prior to construction start.	Not Applicable.
State of Illinois					
Illinois Historic Preservation Agency	NHPA, Section 106	Review and comment on the Project and its effects on historic properties.	Not Applicable.	Consultation initiated on December 17, 2014; response dated January 12, 2015. Consultation complete.	Consultation initiated on December 22, 2014; response dated January 12, 2015. Consultation complete.
Illinois Department of Natural Resources	State-listed species consultation	Provide comments to prevent impacts on state-listed species.	Not Applicable.	Consultation with EcoCat on December 12, 2014; no record response.	Consultation initiated on December 15, 2014; response received December 15, 2014.
Illinois Environmental Protection Agency	NPDES Construction Stormwater General Permit	Issue NPDES Construction Stormwater General Permit.	Not Applicable.	Application to be submitted at least 30 days prior to construction start.	Application not required due to Energy Act Exemption.

TABLE 1.5-1 (continued)					
Major Permits, Approvals, and Consultations Applicable to the Proposed Projects a					
Agency	**Permit/ Approval/ Consultation**	**Agency Action**	**Rover Project Status**	**Panhandle Backhaul Project Status**	**Trunkline Backhaul Project Status**
State of Tennessee					
Tennessee Historical Commission	NHPA, Section 106	Review and comment on the Project and its effects on historic properties.	Not Applicable.	Not Applicable.	Consultation initiated on December 22, 2014; response dated January 8, 2015. Consultation complete.
Tennessee Wildlife Resources Agency	State-listed species consultation	Provide comments to prevent impacts on state-listed species.	Not Applicable.	Not Applicable.	Consultation initiated on December 22, 2014; response is pending.
Tennessee Department of Environment and Conservation	NPDES Construction Stormwater General Permit	Issue NPDES Construction Stormwater General Permit.	Not Applicable.	Not Applicable.	Application to be submitted at least 30 days prior to construction start.
State of Mississippi					
Mississippi Department of Archives and History	NHPA, Section 106	Review and comment on the Project and its effects on historic properties.	Not Applicable.	Not Applicable.	Consultation initiated on December 22, 2014; response dated January 23, 2015. Consultation complete.
Mississippi Department of Wildlife, Fisheries, and Parks	State-listed species consultation	Provide comments to prevent impacts on state-listed species.	Not Applicable.	Not Applicable.	Consultation initiated on December 22, 2014; response is pending.
Mississippi Department of Environmental Quality	NPDES Construction Stormwater General Permit	Issue NPDES Construction Stormwater General Permit.	Not Applicable.	Not Applicable.	Application not required due to Energy Act Exemption.

a Consultations with Native American tribes are discussed in section 4.10.1.

2.0 PROJECT DESCRIPTION

2.1 PROPOSED FACILITIES

The proposed Projects evaluated in this EIS include the Rover Pipeline Project, the Panhandle Project, and the Trunkline Project. The Rover Project would involve construction and operation of new pipeline, 10 compressor stations, 21 meter stations, and associated aboveground facilities as described below. The Panhandle Project would consist of modifications at four existing compressor stations and three valve sites along Panhandle's existing pipeline system. The Trunkline Project would consist of modifications at four existing compressor stations and one meter station along Trunkline's existing pipeline system. Overview maps depicting the locations of these facilities are provided in figures 2.1-1, 2.1-2, and 2.1-3. Detailed maps showing the pipeline routes, aboveground facilities, and contractor yards are contained in the figures referenced in the sections below. The non-jurisdictional facilities associated with the Projects are addressed in section 1.4.

2.1.1 Pipeline Facilities

The proposed Rover Project pipeline facilities would include three main components; nine supply laterals, dual 42-inch pipelines, and a 42-inch single pipeline segment. The Rover Project would cross a total of 510.3 miles through four states, including:

- Nine supply laterals consisting of about 219.2 miles of 24- to 42-inch-diameter pipe, including 18.7 miles of dual 42-inch-diameter pipeline, 1.2 miles of a 24- inch-diameter pipeline and a 42-inch-diameter pipeline installed 20 feet apart within the same right-of-way, and 660 feet of a dual 42-inch-diameter pipeline and a 36-inch-diameter pipeline installed within the same right-of-way. Additionally, 0.2 mile of pipe would be needed from the Seneca Compressor Station to the Rockies Express (REX) Interconnect. Collectively, these nine supply laterals would gather gas from supply sources in Pennsylvania, West Virginia, and Ohio as summarized in table 2.1.1-1 below.
- A dual pipeline mainline consisting of about 191.0 miles of 42-inch-diameter pipeline, including Mainline B consisting of 183.7 miles of 42-inch-diameter pipe installed adjacent to Mainline A. These pipes would be installed 20 feet apart within the same right-of-way. Both would originate in Carroll County, Ohio. Mainline A would terminate at the Defiance Compressor Station, and Mainline B would terminate 7.3 miles east of the Defiance Compressor Station.
- A Market Segment would consist of 100.0 miles of 42-inch-diameter pipe originating at the end of Mainline A in Defiance County, Ohio, and extending north and east through Michigan to the Vector Pipeline in Livingston County, Michigan.

Neither the Panhandle nor Trunkline Projects include any interstate pipeline facilities.

Legend

Rover Project Components

- Mainlines A and B
- Market Segment
- Supply Laterals
- Rex Interconnect
- Aboveground Facilities
- Existing Vector Pipeline
- Existing Panhandle Right-of-Way
- State Boundary
- County Boundary
- Interstate Highway

Note: Counties that would be crossed by the Rover project are labeled by name on this map.

Figure 2.1-1
Rover Pipeline Project
Project Overview Map

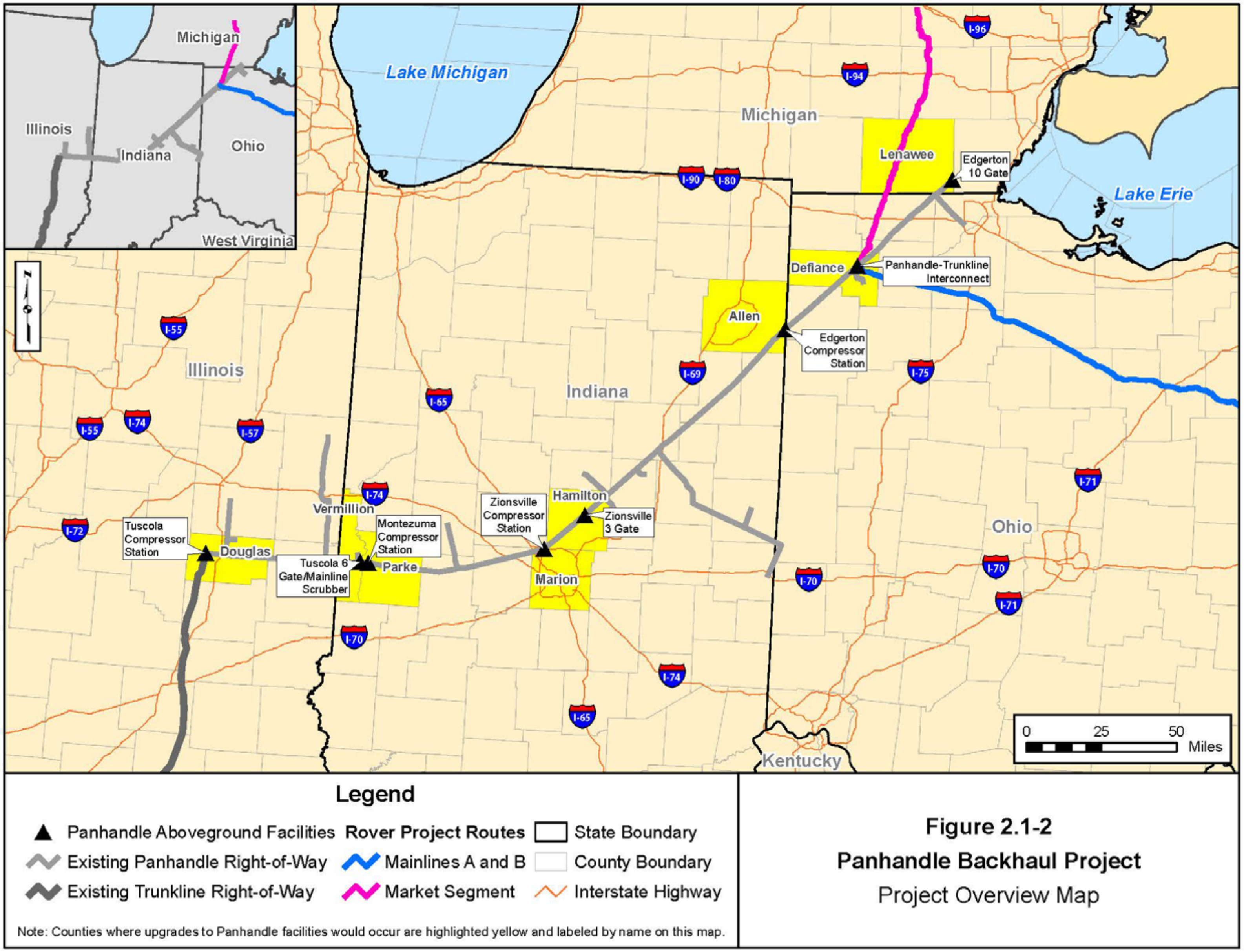
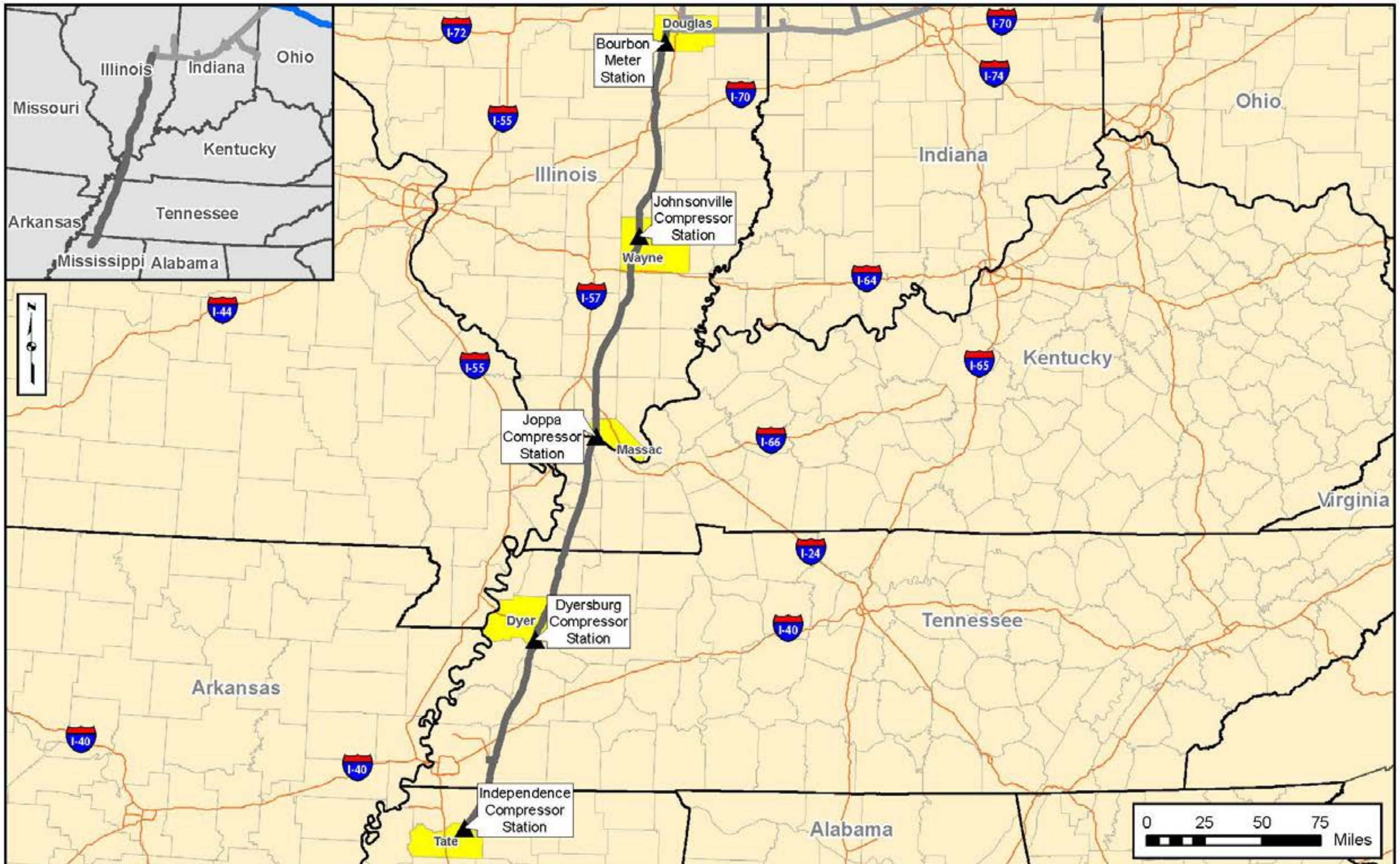


Figure 2.1-2
Panhandle Backhaul Project
Project Overview Map



Legend

- ▲ Trunkline Aboveground Facilities
- Existing Panhandle Right-of-Way
- Existing Trunkline Right-of-Way
- Rover Project Proposed Mainlines A and B
- Interstate Highway
- State Boundary
- County Boundary

Note: Counties where upgrades to Trunkline facilities would occur are highlighted yellow and labeled by name on this map.

Figure 2.1-3
Trunkline Backhaul Project
Project Overview Map

TABLE 2.1.1-1

Pipeline Facilities Associated with the Rover Pipeline Project

State / County	Pipe Diameter	Milepost Range	Length (miles) a
PENNSYLVANIA			
Washington County			
Burgettstown Lateral	36 inches	0.0 - 10.4	10.2
Pennsylvania (subtotal)			**10.2**
WEST VIRGINIA			
Doddridge County			
CGT Lateral	24 inches	0.0 - 5.7	5.9
Sherwood Lateral	36 inches	0.0 - 8.8	9.9
Hancock County			
Burgettstown Lateral	36 inches	10.4 - 15.8	5.5
Marshall County			
Majorsville Lateral	24 inches	0.0 - 12.3	12.3
Tyler County			
Sherwood Lateral	36 inches	8.8 - 32.2	23.4
Wetzel County			
Sherwood Lateral	36 inches	32.2 - 34.7	2.5
West Virginia (subtotal)			**59.4**
OHIO			
Ashland County			
Mainlines A and B	42 inches	79.4 - 95.7	16.4
Belmont County			
Clarington Lateral	42 inches	1.4 - 26.1	24.7
Majorsville Lateral	24 inches	12.3 - 23.5	11.3
Carroll County **b**			
Burgettstown Lateral	36 inches	357 - 51.3	16.0
Supply Connectors A and B	42 inches	17.3 - 18.7	1.4
Mainlines A and B	42 inches	18.7 - 22.6	3.9
Crawford County			
Mainlines A and B	42 inches	113.1 - 130.8	17.7
Defiance County			
Mainline A	42 inches	201.1 - 209.4	8.3
Mainline B	42 inches	201.1 - 202.1	1.0
Market Segment	42 inches	0.0 - 5.5	5.5
Fulton County			
Market Segment	42 inches	10.5 - 27.4	17.1
Hancock County			
Mainlines A and B	42 inches	154.3 - 159.8	5.6

TABLE 2.1.1-1 (continued)

Pipeline Facilities Associated with the Rover Pipeline Project

State / County	**Pipe Diameter**	**Milepost Range**	**Length (miles) a**
Harrison County			
Clarington Lateral	42 inches	26.1 - 32.7	6.8
Cadiz Lateral	30 inches	0.0 - 3.4	3.5
Supply Connectors A and B	42 inches	0.0 - 17.3	17.2
Henry County			
Mainlines A and B	42 inches	182.5 - 201.1	18.6
Market Segment	42 inches	5.5 - 10.5	5.2
Jefferson County			
Burgettstown Lateral	36 inches	15.9 - 35.7	20.1
Monroe County			
Berne Lateral	24 inches	0.0 - 2.0	2.5
Clarington Lateral	42 inches	0.0 - 1.4	1.5
Seneca Lateral	42 inches	1.5 - 25.6	24.2
Sherwood Lateral	36 inches	34.7 - 52.4	18.3
Noble County **c**			
Berne Lateral	24 inches	2.0 - 3.7	1.8
REX Interconnect	42 inches	N/A	0.2
Seneca Lateral	42 inches	0.0 - 1.5	1.6
Richland County			
Mainlines A and B	42 inches	95.6 - 113.1	17.5
Seneca County			
Mainlines A and B	42 inches	130.8 - 154.3	23.5
Stark County			
Mainlines A and B	42 inches	37.2 - 51.4	14.3
Tuscarawas County			
Mainlines A and B	42 inches	22.7 - 37.2	14.5
Wayne County			
Mainlines A and B	42 inches	51.4 - 79.4	27.9
Wood County			
Mainlines A and B	42 inches	159.8 - 182.5	22.6
Ohio (subtotal)			**369.0**

TABLE 2.1.1-1 (continued) **Pipeline Facilities Associated with the Rover Pipeline Project**			
State / County	**Pipe Diameter**	**Milepost Range**	**Length (miles) a**
MICHIGAN			
Lenawee County			
Market Segment	42 inches	27.4 - 56.5	29.3
Livingston			
Market Segment	42 inches	84.4 - 100.0	15.4
Washtenaw			
Market Segment	42 inches	56.5 - 84.4	27.5
Michigan (subtotal)			**72.2**
ROVER PIPELINE PROJECT TOTAL			**510.3**

Note: Totals may not sum correctly due to rounding.

a Lengths listed may not correspond exactly to the milepost range due to route variations that have altered the pipeline length.

b About 600 feet of Mainlines A and B and the Burgettstown Lateral would be collocated.

c About 1.2 miles of the Berne and Seneca Laterals in Noble County would be collocated.

2.1.2 Aboveground Facilities

The proposed Projects would include both construction of new aboveground facilities and modification of existing facilities. These facilities are listed in table 2.1.2-1, and their locations are depicted in figures 2.1-1, 2.1-2, and 2.1-3.

TABLE 2.1.2-1 **Aboveground Facilities for the Projects**				
Facility	**Milepost**	**Operator**	**Municipality**	**County, State**
Compressor Stations				
New Facilities				
Burgettstown	BGL 0.0	Rover	Smith	Washington, PA
Cadiz	CZL 0.0	Rover	Cadiz	Harrison, OH
Clarington	CLL 0.0	Rover	Switzerland	Monroe, OH
Defiance	MS 0.0	Rover	Defiance	Defiance, OH
Mainline 1	MAB 18.9	Rover	Orange	Carroll, OH
Mainline 2	MAB 77.5	Rover	Plain	Wayne, OH
Mainline 3	MAB 128	Rover	Chatfield	Crawford, OH
Majorsville	MJL 0.0	Rover	Dallas	Marshall, WV
Seneca	SEL 0.0	Rover	Marion	Noble, OH
Sherwood	SWL 0.0	Rover	Beech	Doddridge, WV

TABLE 2.1.2-1 (continued)

Aboveground Facilities for the Projects

Facility	Milepost	Operator	Municipality	County, State
Existing Facilities				
Edgerton	--	Panhandle	Edgerton	Allen, IN
Montezuma	--	Panhandle	Montezuma	Parke, IN
Tuscola	--	Panhandle	Garrett	Douglas, IL
Zionsville	--	Panhandle	Indianapolis	Marion, IN
Dyersburg	--	Trunkline	Friendship	Dyer, TN
Independence	--	Trunkline	Herando	Tate, MS
Johnsonville	--	Trunkline	Johnsonville	Wayne, IL
Joppa	--	Trunkline	Joppa	Massac, IL
Tie-In / Interconnect Sites				
New Facilities				
Cadiz Tie-In	CLL 0.0	Rover	Franklin	Monroe, OH
CGT Tie-In	SWL 1.5A	Rover	Beech	Doddridge, WV
Mainline B Tie-In	SAB 0.0	Rover	Switzerland	Monroe, OH
Majorsville Tie-In	CLL 11.8	Rover	Marion	Noble, OH
REX Tie-In	REX 0.19	Rover	Marion	Noble, OH
Sherwood Tie-In	SEL 16.7	Rover	Beech	Doddridge, WV
Panhandle-Rover Interconnect	--	Panhandle	Defiance	Defiance, OH
Existing Facilities				
Panhandle-Trunkline Interconnect	--	Trunkline	Montezuma	Vermillion, IN
Receipt and Delivery Meter Station a				
New Facilities				
ANR Delivery	MA 208.9	Rover	Tiffin	Defiance, OH
Berne Receipt	BRL 0.0	Rover	Franklin	Monroe, OH
Burgettstown Receipt*	BGL 0.0	Rover	Smith	Washington, PA
Cadiz Receipt*	CZL 0.0	Rover	Cadiz	Harrison, OH
CGT Delivery	CGT 5.8	Rover	Beech	Doddridge, WV
Clarington Receipt*	CLL 0.4	Rover	Switzerland	Monroe, OH
Consumers Energy Delivery	MS 75.0	Rover	Lima	Washtenaw, MI
Gulfport Receipt	SEL 22.6	Rover	Switzerland	Monroe, OH
Madison Meter Station	SEL 9.8	Rover	Handy	Monroe, OH
Clarington A (EQT) Meter Station	SEL 25.6	Rover	Switzerland	Monroe, OH
Majorsville Receipt	MJL 0.0	Rover	Dallas	Marshall, WV
PEPL Delivery*	MS 0.0	Rover	Tiffin	Defiance, OH
REX Delivery*	SEL 0.0	Rover	Marion	Noble, OH
REX Receipt*	SEL 0.0	Rover	Marion	Noble, OH
Seneca Receipt*	SEL 0.0	Rover	Marion	Noble, OH
Sherwood Receipt*	SWL 0.0	Rover	Beech	Doddridge, WV

TABLE 2.1.2-1 (continued)

Aboveground Facilities for the Projects

Facility	Milepost	Operator	Municipality	County, State
Vector Delivery	MS 100.0	Rover	Handy	Livingston, MI
Existing Facilities				
Edgerton 10 Gate	--	Panhandle	Riga	Lenawee, MI
Tuscola 6 Gate/Mainline Scrubber	--	Panhandle	Montezuma	Vermillion, IN
Zionsville 3 Gate	--	Panhandle	Cicero	Hamilton, IN
Bourbon Meter Station	--	Trunkline	Arcola	Douglas, IL

Note: Meter stations with an asterisk (*) would be collocated with the corresponding compressor station.
a The Clarington Station would contain four meters, and the Cadiz Station would contain two meters.

Rover would construct a total of 10 compressor stations, 6 tie-in sites, and 21 receipt or delivery meter stations (collectively, "meter stations"). Six of the new compressor stations would be constructed along the Supply Laterals, three would be along Mainlines A and B, and the last would be along the Market Segment. Each compressor station would consist of a compressor building, an office building, various utility buildings, tanks, valves, and piping. The tie-in sites would be constructed at pipeline interconnections outside of compressor and meter station sites. The tie-in sites would include a mainline valve and a launcher/receiver. Rover's meter stations would be installed at pipeline interconnections along the routes to measure the receipt and delivery of natural gas between pipeline systems. Eleven of the meter stations would monitor gas coming into the Rover system (receipt meter stations), six meter stations would monitor the delivery of Rover's gas (delivery meter stations), and two of the meter stations would be designed to monitor gas coming into or leaving the Rover system (bi-directional meter stations). Six of the meter stations would be sited at a compressor station site: the Cadiz Compressor Station would accommodate two receipt meters, and the Clarington Compressor Station would house two receipt meters and two bi-directional flow meters. The remaining nine meter stations would be constructed on newly leased or purchased parcels along the pipeline right-of-way.

For the Panhandle Project, the applicant proposes to modify four existing compressor stations to allow for bi-directional flow of natural gas on its existing pipeline system. To accommodate this, Panhandle proposes to install new pipe, valves, fittings, and associated materials to allow for bi-directional flow at each of the compressor stations. The Panhandle Project would also include installation of minor piping, pressure controls, valves, fittings, and associated materials at three valve sites (Edgerton 10 Gate, Zionsville 3 Gate, and Tuscola 6 Gate). These modifications would take place on lands owned by Panhandle within its existing compressor or meter stations. Panhandle would also install tap valves and associated piping for an interconnection with the Rover Project at the Rover Defiance Compressor Station.

For the Trunkline Project, the applicant proposes to modify four existing compressor stations to allow for bi-directional flow of natural gas on its existing pipeline system. Specifically, Trunkline proposes to install new pipe, valves, fittings, and equipment to allow for bi-directional flow at each of the compressor stations. The Trunkline Project would also reconfigure the Bourbon Meter Station to allow for bi-directional flow by installing new pipe, valves, fittings, and other associated materials. Trunkline would also replace the existing meters and regulators at this site. All of these modifications would take place on lands owned by Trunkline within the existing compressor or meter station sites. Trunkline would also install tap valves and associated piping for an interconnection with the Panhandle Project at the Panhandle-Trunkline Tuscola Compressor Station.

2.2 LAND REQUIREMENTS

Table 2.2-1 summarizes the land use requirements for the pipelines and associated facilities, including compressor and meter stations, contractor yards, and access roads that are described in sections 2.2.1 through 2.2.4 below. A more detailed description of the land use requirements for the Projects is presented in appendix O. If the Projects are approved, the applicants' construction and operational work areas would be limited to those described in the final EIS and any subsequent Commission authorizations as described in section 2.5.4.

TABLE 2.2-1

Summary of Land Requirements Associated with the Projects

Facility	Land Affected during Construction (acres) a	Land Affected during Operation (acres) a
PIPELINE FACILITIES		
Mainlines Pipeline Right-of-Way	3,323.5	1,372.6
Market Segment Pipeline Right-of-Way	1,702.4	566.4
Supply Laterals Right-of-Way	3,513.3	1,348.0
Pipeline Facilities Total	**8,539.2**	**3,286.9**
ABOVEGROUND FACILITIES b		
Compressor Stations		
Rover Pipeline Project	267.9	90.8
Panhandle Backhaul Project	221.0	0.0
Trunkline Backhaul Project	153.7	0.0
Tie-Ins / Interconnects		
Rover Pipeline Project	15.2	6.0
Panhandle Backhaul Project	3.4	0.0
Trunkline Backhaul Project **c**	0.0	0.0
Mainline Valves/Valve Sites		
Rover Pipeline Project	0.0	0.0
Panhandle Backhaul Project	5.1	0.0
Trunkline Backhaul Project	0.0	0.0
Meter Stations		
Rover Pipeline Project	59.4	10.9
Panhandle Backhaul Project	0.0	0.0
Trunkline Backhaul Project	14.4	0.0
Aboveground Facilities Total	**740.0**	**107.7**
CONTRACTOR YARDS		
Rover Pipeline Project	590.7	0.0
Panhandle Backhaul Project	0.0	0.0
Trunkline Backhaul Project	0.0	0.0
Contractor Yards Total	**590.7**	**0.0**

TABLE 2.2-1 (continued) **Summary of Land Requirements Associated with the Projects**		
Facility	**Land Affected during Construction (acres) a**	**Land Affected during Operation (acres) a**
ACCESS ROADS		
Michigan	14.7	5.0
Ohio	57.5	13.9
Pennsylvania	0.5	0.0
West Virginia	53.1	8.5
Access Roads Total	**125.8**	**27.4**
PROJECT TOTAL	**9,995.7**	**3,421.9**

a Note: The totals shown in this table may not equal the sum of addends due to rounding.

b The mainline valves and pig launcher and receiver facilities would be installed within the operational easement and would not result in additional land impacts beyond those already accounted for above.

c The Trunkline's Panhandle-Trunkline Interconnect would be installed within Panhandle's Tuscola Compressor Station and would not result in additional land impacts beyond those already accounted for within the compressor station acreage impacts.

Construction of the Rover Project would disturb 9,598.1 acres of land, including pipeline facilities, aboveground facilities, contractor yards, and access roads. Of this, 3,286.9 acres would be for the permanent right-of-way, 107.7 acres would be for aboveground facilities, and 27.4 acres would be for permanent access roads. The remaining 6,176.8 acres of disturbed land would be restored and allowed to revert to pre-construction use.

For the Panhandle Project, the applicant proposes to use the existing yards at four compressor stations, totaling 221.0 acres, for construction of modifications and updates at those facilities and as temporary workspace. Construction activities at the three valve sites would take place entirely within Panhandle's existing right-of-way on lands totaling 5.1 acres. Panhandle would install an interconnection with the Rover pipeline impacting 3.4 acres of land within Rover's Defiance Compressor Station site.

For the Trunkline Project, the applicant proposes to use the existing yards at four compressor stations, totaling 153.7 acres, for construction of modifications and updates at those facilities and as temporary workspace. Construction activities at the Bourbon Meter Station would take place on 14.4 acres of land. Trunkline would install an interconnection with the Panhandle pipeline at the Panhandle-Trunkline Tuscola Compressor Station site. Impacts for this site are accounted for within those presented above for the Panhandle Project.

2.2.1 Pipeline Facilities

Of the 8,539.2 acres that would be disturbed during construction of the Rover pipeline facilities, 3,286.9 acres would be retained as new permanent right-of-way and 5,252.3 acres would be used as temporary workspace.

2.2.1.1 Collocation with Existing Rights-of-Way

Approximately 24 percent of Rover's pipeline rights-of-way would be collocated or adjacent to existing pipeline, roadway, railway, and/or utility rights-of-way. A summary of areas where the Rover Project would be adjacent to existing rights-of-way is presented in table 2.2.1-1. In these cases, the pipeline would not be installed within an existing right-of-way, but may utilize the existing utility right-of-way for temporary construction workspaces. Due to proximity of portions of the proposed Market Segment to existing rights-of-way, there would be some overlapping of the Rover permanent right-of-way with the existing right-of-way, as shown in table 2.2.1-1.

TABLE 2.2.1-1

Summary of Pipeline Collocated with Existing Rights-of-Way

Start MP	End MP	Parallel Length (feet)	Permanent Right-of-Way Overlap (feet)	Operator
Berne Lateral				
0.5	0.9	1,584.0	0.0	Blue Racer Midstream Pipeline
0.7	0.8	528.0	0.0	Transmission Line
0.8	0.5	528.0	0.0	Blue Racer Midstream Pipeline
1.0	1.1	528.0	0.0	Blue Racer Midstream Pipeline
1.1	1.6	2,640.0	0.0	Transmission Line
1.6	1.8	1,056.0	0.0	Blue Racer Midstream Pipeline
1.8	2.4	3,168.0	0.0	Transmission Line
2.4	2.6	528.0	0.0	Blue Racer Midstream Pipeline
2.6	3.2	3,696.0	0.0	Texas Eastern Pipeline
Burgettstown Lateral				
0.3	0.4	528.0	0.0	Columbia Gas Pipeline
1.7	3.7	10,560.0	0.0	Columbia Gas Pipeline
4.2	4.5	1,584.0	0.0	Columbia Gas Pipeline
14.4	14.8	2,112.0	0.0	American Electric Power
45.6	45.8	1,056.0	0.0	Access Midstream
47.5	47.6	1,056.0	0.0	Access Midstream
47.7	48.1	2,112.0	0.0	Access Midstream
50.9	51.0	528	0.0	Ashworth Gas Pipeline
Cadiz Lateral – no collocation				
CGT Lateral				
0.9	2.2	6,864.0	0.0	Markwest Pipeline
2.7	4.0	6,864.0	0.0	Markwest Pipeline
4.2	4.2	528.0	0.0	Summit Midstream Pipeline
4.7	5.0	1,584.0	0.0	Summit Midstream Pipeline
5.0	5.3	1,056.0	0.0	Dominion Pipeline
5.3	5.7	2,112.0	0.0	Energy Transfer Pipeline
Clarington Lateral				
0.7	1.6	4,752.0	0.0	Dominion Pipeline
2.1	3.0	4,752.0	0.0	East Ohio Gas Company Pipeline
3.0	3.2	1,056.0	0.0	Overhead Electric Powerline
5.1	5.8	3,696.0	0.0	East Ohio Gas Company Pipeline

TABLE 2.2.1-1 (continued)

Summary of Pipeline Collocated with Existing Rights-of-Way

Start MP	End MP	Parallel Length (feet)	Permanent Right-of-Way Overlap (feet)	Operator
6.4	7.5	528.0	0.0	East Ohio Gas Company Pipeline
8.0	8.5	2,640.0	0.0	CGT Pipeline
11.1	11.2	528.0	0.0	East Ohio Gas Company Pipeline
11.4	12.5	5,808.0	0.0	East Ohio Gas Company Pipeline
13.1	13.2	528.0	0.0	Dominion Pipeline
13.2	13.8	3,168.0	0.0	East Ohio Gas Company Pipeline
13.9	15.3	7,392.0	0.0	East Ohio Gas Company Pipeline
15.4	16.7	6,336.0	0.0	East Ohio Gas Company Pipeline
16.8	18.2	7,392.0	0.0	East Ohio Gas Company Pipeline
18.9	19.1	1,056.0	0.0	Dominion East Ohio Pipeline
19.1	19.6	2,640.0	0.0	Blue Racer Midstream Pipeline
20.2	21.3	5,808.0	0.0	East Ohio Gas Company Pipeline
20.9	21.3	2,112.0	0.0	East Ohio Gas Company Pipeline
22.2	22.5	1,056.0	0.0	East Ohio Gas Company Pipeline
22.5	22.6	528.0	0.0	East Ohio Gas Company Pipeline
22.9	23.1	1,584.0	0.0	Dominion Pipeline
29.2	29.8	3,168.0	0.0	Transmission Line
31.4	31.5	1,056.0	0.0	East Ohio Gas Company Pipeline
31.8	32.3	2,640.0	0.0	Markwest Utica EMG Pipeline
32.4	32.5	528.0	0.0	Markwest Utica EMG Pipeline
32.5	32.7	1,056.0	0.0	Transmission Line
Mainlines A and B				
19.8	20.1	1,056.0	0.0	Tennessee Gas Pipeline
20.2	20.5	1,056.0	0.0	Dominion
20.9	21.7	4,224.0	0.0	Unknown
22.5	22.9	2,640.0	0.0	Midstream Pipeline
36.9	37.5	3,168.0	0.0	Dominion
59.7	60.0	1,584.0	0.0	Dominion Pipeline
82.2	85.0	14,784.0	0.0	Osmose
111.8	112.9	6,336.0	0.0	Transmission Line
113.7	114.7	7,392.0	0.0	Transmission Line
115.1	117.7	13,728.0	0.0	Transmission Line
119.7	121.7	10,560.0	0.0	Unknown
126.4	132.5	31,680.0	0.0	Oglethorpe Power Company
133.7	135.1	7,392.0	0.0	Oglethorpe Power Company
135.7	137.0	6,864.0	0.0	Oglethorpe Power Company
138.1	139.9	9,504.0	0.0	Oglethorpe Power Company

TABLE 2.2.1-1 (continued)

Summary of Pipeline Collocated with Existing Rights-of-Way

Start MP	End MP	Parallel Length (feet)	Permanent Right-of-Way Overlap (feet)	Operator
141.1	143.7	14,256.0	0.0	Oglethorpe Power Company
144.4	146.3	10,032.0	0.0	Oglethorpe Power Company
147.0	147.2	1,584.0	0.0	Oglethorpe Power Company
148.0	150.7	14,784.0	0.0	Oglethorpe Power Company
153.7	155.2	7,920.0	0.0	Oglethorpe Power Company
172.8	175.9	15,840.0	0.0	Columbia Gas Pipeline
176.3	178.4	11,088.0	0.0	Columbia Gas Pipeline
179.5	181.1	8,448.0	0.0	Columbia Gas Pipeline
181.8	183.5	8,976.0	0.0	Columbia Gas Pipeline
184.2	186.2	10,560.0	0.0	Crossroads Pipeline
187.2	190.2	15,840.0	0.0	Crossroads Pipeline
193.7	195.6	10,560.0	0.0	Crossroads Pipeline
196.6	197.7	5,808.0	0.0	Crossroads Pipeline
Majorsville Lateral				
0.0	0.3	2,112.0	0.0	Unknown Overhead Powerline
1.0	1.1	528.0	0.0	Williams Pipeline
1.9	2.2	1,056.0	0.0	CNX Gas Pipeline
7.0	7.2	1,056.0	0.0	Dominion Pipeline
9.9	10.0	1,056.0	0.0	American Electric Power
11.1	11.2	528.0	0.0	CGT Pipeline
14.7	15.0	1,584.0	0.0	Unknown Overhead Powerline
18.4	19.5	5,808.0	0.0	XTO Energy Pipeline
19.9	20.2	1,584.0	0.0	East Ohio Gas Company Pipeline
20.5	20.6	1,056.0	0.0	East Ohio Gas Company Pipeline
Market Segment				
61.2	62.0	4,224.0	0.0	ITC
67.7	68.6	4,224.0	15.0	Enbridge Pipeline
68.6	69.6	5,808.0	65.0	Panhandle Eastern Pipeline
70.5	70.6	528.0	65.0	Panhandle Eastern Pipeline
70.9	76.4	28,512.0	65.0	Panhandle Eastern Pipeline
76.5	77.4	4,224.0	65.0	Enbridge Pipeline
77.6	78.3	3,696.0	65.0	Enbridge Pipeline
78.3	78.6	1,584.0	15.0	ITC
78.6	79.5	4,752.0	0.0	Enbridge Pipeline
82.3	83.5	6,336.0	20.0	ITC
86.4	87.2	3,696.0	20.0	ITC
88.0	88.9	4,752.0	20.0	ITC

TABLE 2.2.1-1 (continued)

Summary of Pipeline Collocated with Existing Rights-of-Way

Start MP	End MP	Parallel Length (feet)	Permanent Right-of-Way Overlap (feet)	Operator
90.4	99.9	50,160.0	20.0	ITC
Seneca Lateral				
6.1	7.9	9,504.0	0.0	Texas Eastern Pipeline
8.3	8.7	2,112.0	0.0	Texas Eastern Pipeline
9.0	9.3	1,056.0	0.0	Texas Eastern Pipeline
9.3	12.2	14,784.0	0.0	Texas Eastern Pipeline
12.7	13.0	1,584.0	0.0	Texas Eastern Pipeline
13.2	15.4	11,616.0	0.0	Texas Eastern Pipeline
15.5	18.4	15,312.0	0.0	Texas Eastern Pipeline
19.0	19.8	3,696.0	0.0	Texas Eastern Pipeline
19.9	21.7	9,504.0	0.0	Texas Eastern Pipeline
22.3	22.8	2,640.0	0.0	Texas Eastern Pipeline
23.0	23.1	528.0	0.0	Transmission Line
23.5	24.3	4,752.0	0.0	Texas Eastern Pipeline
24.3	24.7	2,112.0	0.0	Transmission Line
25.0	25.2	1,056.0	0.0	Texas Eastern Pipeline
25.2	25.5	1,584.0	0.0	Tallgrass Energy Pipeline
Sherwood Lateral				
0.07A	0.17A	528.0	0.0	Key Oil Pipeline
1.07B	1.24B	1,056.0	0.0	Antero Resources Pipeline
1.6	1.8	1,056.0	0.0	Eureka Hunter Pipeline
5.2	5.3	528.0	0.0	Houston Exploration Co. Pipeline
6.3	6.4	1,056.0	0.0	Dominion Pipeline
8.9	9.0	528.0	0.0	Miss Utility of WV Pipeline
14.3	14.5	1,056.0	0.0	Console Energy Pipeline
16.9	17.1	1,056.0	0.0	Texas Keystone Pipeline
17.6	17.9	1,584.0	0.0	Texas Keystone Pipeline
20.4	20.7	2,112.0	0.0	Unknown Pipeline
27.8	28.2	1,584.0	0.0	Unknown Pipeline
28.9	29.0	528.0	0.0	Unknown Pipeline
37.3	37.8	2,640.0	0.0	Eureka Hunter Pipeline
38.0	38.0	0.0	0.0	Eureka Hunter Pipeline
40.9	41.0	528.0	0.0	Foreign Pipeline

TABLE 2.2.1-1 (continued) **Summary of Pipeline Collocated with Existing Rights-of-Way**				
Start MP	**End MP**	**Parallel Length (feet)**	**Permanent Right-of-Way Overlap (feet)**	**Operator**
Supply Connector Lines A and B				
0.3	0.8	2,640.0	0.0	Dominion Pipeline
1.1	1.4	2,112.0	0.0	Dominion Pipeline
5.6	5.9	1,584.0	0.0	Eclipse Pipeline
7.4	8.0	3,168.0	0.0	Midstream Pipeline
11.0	11.2	528	0.0	Cardinal Pipeline
11.2	11.5	1,056.0	0.0	Unknown

2.2.1.2 Right-of-Way Configurations

Rover proposes to use various construction right-of-way widths, depending on the size of the pipe and land use of the construction area (see table 2.2.1-2). In locations where Rover proposes to use the Horizontal Directional Drill (HDD) method, there would be limited disturbance of the ground surface between the trenchless construction workspaces as described further below.

TABLE 2.2.1-2 **Summary of Construction Right-of-Way Configurations for the Rover Pipeline Project a**					
Pipeline Segment and Pipe Size	**Width in Agricultural Land (feet)**	**Width in Upland Areas (feet)**	**Width in Non-Forested Wetlands (feet)**	**Width in Forested Wetlands (feet)**	**Width for Steep Side Slope (feet)**
24-Inch-Diameter Pipe					
Berne, CGT, and Majorsville Laterals	100	75	75	75	75 plus 25 feet additional temporary workspace.
30-Inch-Diameter Pipe					
Cadiz Lateral	150	125	100	75	125 plus 25 feet additional temporary workspace.
36-Inch-Diameter Pipe					
Burgettstown and Sherwood Laterals	150	125	100	75	125 plus 25 feet additional temporary workspace.
42-Inch-Diameter Pipe					
Seneca and Clarington Laterals and Market Segment	150	125	100	75	125 plus 25 feet additional temporary workspace.
Dual 42-Inch-Diameter pipe					
Supply Connectors A and B and Mainlines A and B	150	135	120	95	135 plus 15 feet additional temporary workspace.
a The widths listed in the table represent Rover's requested right-of-way widths. However, we are recommending in section 4.4.4 that Rover adhere to alternate widths through wetlands.					

Appendix D depicts the typical right-of-way configurations for the Rover pipeline construction. The width of the construction right-of-way for the various size pipelines would vary depending on site-specific factors. The construction right-of-way for a single 24-inch-diameter pipeline would typically be 75 feet wide, with 48 feet on the working side and 13 feet on the non-working (spoil) side of the pipeline. The construction right-of-way for the 30-, 36-, and single 42-inch-diameter pipeline would typically be 125 feet wide, with 75 feet on the working side and 30 feet on the non-working (spoil) side of the pipeline. For areas where dual pipelines are to be installed,[1] the construction right-of-way would typically be 135 feet wide, with 65 feet on the working side and 50 feet on the non-working (spoil) side of the proposed pipeline. The permanent right-of-way would be 50 feet wide where a single pipeline is installed, 60 feet wide where dual pipelines are installed, and 80 feet wide for about 680 feet where the dual Mainlines A and B pipelines would be installed within the same right-of-way as the Burgettstown Lateral. The remaining width within each construction right-of-way represents the trench width.

In addition to the right-of-way configurations noted above, Rover has proposed a slightly different configuration for the construction and permanent right-of-way for the Seneca Lateral. Originally, in association with its Leach XPress Pipeline Project, Columbia Gas Transmission, LLC (Columbia) proposed to construct pipeline facilities in exactly the same location as Rover's proposed Seneca Lateral. As noted in table 2.2.1-1 above, the Seneca Lateral (and Columbia's Leach XPress Project) would parallel Texas Eastern Transmission LP's existing natural gas pipeline to the south. However, in response to a FERC information request, Rover and Columbia reached an agreement in early July of 2016 to design their respective pipeline facilities in a manner that optimizes available construction terrain. As a result, Rover and Columbia have agreed to locate both their pipelines within a 50-foot-wide permanent easement that would directly abut Texas Eastern Transmission LP's existing easement. Along this segment of the Seneca Lateral, Rover and Columbia's pipelines would be centered within the easement with an offset of 20 feet between them (and 15 feet from the edge of the easement to the closest pipeline), as depicted in Rover's LXP/Rover Pipeline typical drawing (see appendix D).

While the Seneca Lateral and the Leach XPress pipelines would be located within the same easement, Columbia and Rover have not identified the specific side of the easement. The companies have indicated that due to constructability issues, the first pipeline that would be constructed must be installed closest to Texas Eastern Transmission LP's existing easement. The second would be installed the furthest from the easement. However, due to the uncertainty of the exact timing of construction, the companies have proposed a non-exclusive easement, where the first project to begin construct would directly parallel Texas Eastern Transmission LP's existing easement.

The Leach XPress Project and Rover's Seneca Lateral roughly follow Texas Eastern Transmission LP's existing easement for about 20 miles. Because there are constraints in the general vicinity such as residences, waterbodies, and geologic features, directly paralleling Texas Eastern Transmission LP's existing easement is not feasible for the entire 20 miles. Therefore, Rover and Columbia have identified several locations where both pipelines cannot be installed in the 50-foot non-exclusive easement and must diverge for short segments. In addition to some of these areas, the companies have identified some areas where two pipelines cannot be installed in the same non-exclusive easement, and yet have not identified alternative proposed routing to address the issue**. Therefore, we recommend that:**

- **<u>As part of its Implementation Plan,</u> Rover should confirm the location of the Seneca Lateral within its non-exclusive easement and identify any locations**

[1] That is, Supply Connectors A and B (MPs 0.0 to 18.6); Mainlines A and B (MPs 18.6 to 202.1); and the 6,700-foot segment where the Berne Lateral would enter (MPs 2.5 to 3.7) and the Seneca Lateral (MPs 0.0 to 1.2) depart from the Seneca Compressor Station.

where the lateral would deviate from the non-exclusive easement in accordance with recommendation 5 (see section 5.2).

Where the HDD method is used, the permanent rights-of-way would be 50 feet wide for single pipelines and 60 feet wide for dual pipelines. Where the pipeline is constructed across public roadways, Rover would seek to obtain the appropriate easements, permits, or license agreements for such construction and operation. To the extent that Rover is issued an easement, permit, or license agreement for construction and operation of the pipeline within public roadways, no permanent right-of-way would be maintained unless otherwise required by such agreement.

2.2.1.3 Extra Workspace

In addition to the various construction right-of-way configurations described in section 2.2.1.2, Rover has requested a wider construction right-of-way in several locations due to the presence of the constraints mentioned above and for other site-specific, construction-related reasons. Appendix E identifies where Rover has requested extra workspace for staging areas and resource crossings, and includes workspace dimensions, the acreage of impact, associated land use, and Rover's justification for their use. A detailed discussion of Rover's requests for extra workspace is provided in section 2.3 and in sections 4.3.3.7 and 4.4.4.

No additional temporary workspace has been requested for the Panhandle and Trunkline Projects.

Additional extra workspaces beyond those currently identified could be required during construction of the Projects. Prior to construction, the applicants would be required to file a complete and updated list of all extra work areas (including contractor yards) for review and approval (see Post-Approval Variance Process in section 2.5.4).

2.2.2 Aboveground Facilities

The proposed aboveground facilities for the Rover Project include 10 new compressor stations, 21 new meter stations, 6 new tie-ins, 78 mainline valves, and 11 pig launcher and receiver facilities (see table 2.1.2-1). Additionally, Rover proposes to install satellite dishes at each of its meter stations. Construction of the 10 compressor stations, 21 meter stations, and 6 tie-in sites would require 342.5 acres of land, 107.7 acres of which would be used permanently during operation. Mainline valves, pipe interconnections, and pig launchers/pig receiver (that would not be located at a compressor or meter station) would be located entirely within the permanent right-of-way and therefore would not encumber any additional acreage.

Rover proposes to use remote-controlled mainline valves along the pipeline route. These valves would be continuously monitored at Rover's gas control center. In the event of an incident, the valves can be closed with an electronic command.

Construction of the Panhandle Project would affect 229.4 acres of previously disturbed lands on parcels that are owned or leased by Panhandle. Panhandle would not need to acquire any additional property for Project operation.

Construction of the Trunkline Project would occur on 168.1 acres of previously disturbed lands on parcels that are owned or leased by Trunkline. Trunkline would not need to acquire any additional property for Project operation.

2.2.3 Contractor Yards

To support construction activities, Rover proposes to use 13 contractor yards on a temporary basis. The contractor yards would be used for equipment, pipe sections, and construction material and supply storage, as well as for temporary field offices, parking, and pipe preparation and pre-assembly staging areas. The use of these sites would temporarily affect about 590.7 acres of land. These sites are classified as having predominately open land, with some industrial/commercial land and a small amount of agricultural land use (see table 2.2.3-1). Land use types are defined in section 4.8. Contractor yards are depicted on the maps in appendix B.

No contractor yards would be required for the Panhandle and Trunkline Projects; instead, these applicants would use existing compressor station sites for equipment and materials storage during construction.

2.2.4 Access Roads

In addition to public roads, Rover proposes to use 225 private access roads along the pipeline route (1 in Pennsylvania, 72 in West Virginia, 129 in Ohio, and 23 in Michigan) to construct the pipeline (see maps in appendix B). Of these 225 roads, 139 are existing roads, 44 would be a combination of existing and new roads, and 42 would be newly constructed. Rover proposes to maintain 53 of the 225 roads permanently for operations. Twelve of the 172 proposed temporary access roads would be newly constructed, 128 would be existing, and 32 would be expanded or widened. Rover has proposed a typical 20-foot or 25-foot width for all new access roads, with the exception of two 75-foot-wide access roads proposed at mileposts (MPs) MS 75.6 and MS 100.0[2] along the Market Segment. These 75-foot-wide access roads have been identified for permanent access to the Consumers Meter Station and Vector Meter Station. Rover would require the extra width for these access roads for installation of electric powerlines that are needed to add additional power supply to each of the meter stations.

Modifications to existing roads could include tree, brush, or structure removal; widening and/or grading; installation of culverts; and addition of gravel. The location, description, length, land use, and type of improvement required (if any) for each of the access roads are listed in appendix F.

The applicants would use existing roads to access each of the work areas during construction of the Panhandle and Trunkline Projects.

[2] Milepost locations for the Rover Project are abbreviated throughout the document using the following: SWL=Sherwood Lateral, CGT=CGT Lateral, BRL=Berne Lateral, SEL=Seneca Lateral, CLL=Clarington Lateral, MJL=Majorsville Lateral, CZL=Cadiz Lateral, BGL=Burgettstown Lateral, SAB=Supply Connectors A and B, MAB=Mainlines A and B, MA=Mainline A, MS=Market Segment.

TABLE 2.2.3-1			
Contractor Yards along the Rover Pipeline Project Route			
State/Yard	**County**	**Size (acres)**	**Land Use**
West Virginia			
Majorsville Yard	Marshall	39.0	Industrial/Commercial
Sherwood Yard	Tyler	18.0	Open Land
Subtotal		***56.9***	
Ohio			
Ashland Yard	Ashland	21.3	Industrial/Commercial
Bucyrus Yard	Crawford	66.8	Open Land
Burgettstown Yard	Jefferson	200.0	Open Land
Clarington Yard	Harrison	48.0	Open Land
Defiance Yard	Defiance	23.7	Industrial/Commercial
Dennison Yard	Tuscarawas	61.6	Open Land
Dover Yard	Tuscarawas	21.8	Industrial/Commercial
Mansfield Yard	Richland	23.0	Industrial/Commercial
Seneca Yard	Monroe	8.6	Open Land
Subtotal		***474.7***	
Michigan			
Oakville Yard	Monroe	43.5	Industrial/Commercial
Whitmore Lake Yard	Livingston	15.5	Industrial/Commercial
Subtotal		***59.0***	
ROVER PIPELINE PROJECT TOTAL		**590.7**	

2.3 CONSTRUCTION PROCEDURES

The Rover Project would be designed, constructed, tested, and operated in accordance with all applicable requirements included in the U.S. Department of Transportation (DOT) regulations in 49 CFR 192,[3] *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*, and other applicable federal and state regulations, including the U.S. Department of Labor, Occupational Safety and Health Administration requirements. These regulations are intended to ensure adequate protection for the public. Among other design standards, Part 192 specifies pipeline material and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

[3] Pipe design regulations for steel pipe are contained in subpart C, Part 192. Section 192.105 contains a design formula for the pipeline's design pressure. Sections 192.107 through 192.115 contain the components of the design formula, including yield strength, wall thickness, design factor, longitudinal joint factor, and temperature derating factor, which are adjusted according to the project design conditions, such as pipe manufacturing specifications, steel specifications, class location, and operating conditions. Pipeline operating regulations are contained in subpart L, Part 192.

To reduce construction impacts, Rover would implement its Construction Mitigation Plans (CMPs) (see appendix G). The CMPs include Rover's *Upland Erosion Control, Revegetation, and Maintenance Plan* (Rover's Plan[4]), which is based on our *Upland Erosion Control, Revegetation, and Maintenance Plan* (our Plan[5]). The CMPs also include Rover's *Wetland and Waterbody Construction and Mitigation Procedures* (Rover's Procedures[6]), which are based upon and contain many of the measures found in our *Wetland and Waterbody Construction and Mitigation Procedures* (our Procedures[4]). The intent of Rover's Plan and Procedures is to identify baseline mitigation measures and construction techniques that incorporate guidelines recommended by various resource agencies (such as proper disposal of construction materials and debris), as well as other guidelines and plans tailored to Project-specific issues. The CMPs contain numerous measures designed to prevent or minimize potential impacts on resources. As indicated in appendix G, Rover's CMPs include some alternative measures that differ from our standard Plan and Procedures, such as the use of certain extra workspaces. These alternative measures are discussed in more detail in sections 4.2.5, 4.3.2, 4.4.3, and 4.4.4, which also include our recommendations for the appropriateness of these modifications.

Rover's Plan and Procedures propose six notable modifications from our standard Plan and Procedures. These modifications, their descriptions, and our recommendations are listed below in table 2.3-1.

Rover's Plan and Procedures also include deviations from our standard Plan and Procedures not listed in table 2.3-1, but they are more protective than our requirements, and we have found them to be acceptable. Panhandle and Trunkline propose to adopt our Plan and Procedures without modifications.

To avoid or minimize the potential for harmful spills and leaks during construction, Rover has developed *Spill Prevention and Response Procedures* (Rover's Spill Procedures). Rover's Spill Procedures describe spill and leak preparedness and prevention practices, procedures for emergency preparedness and incident response, and training requirements. Additional discussion of Rover's Spill Procedures is presented in section 4.3.2.

Other resource-specific plans have been developed for the Rover Project and are included in the CMP. These plans include the following: *Horizontal Directional Drilling Contingency Plan* (Rover's HDD Plan), *Unanticipated Discovery Plan for Paleontological Resources* (Rover's Paleontological Discovery Plan),[7] *Agricultural Impact Mitigation Plan* (for both Ohio and Michigan) (Rover's AIMP), *Residential Access and Traffic Mitigation Plan* (Rover's Traffic Plan), *Karst Mitigation Plan*, *Blasting Plan*, and *Winter Construction Plan* (Rover's WCP). These plans are introduced below and are discussed in more detail in section 4.0 and appendix G.

---

[4] Rover's Plan is available on the FERC's eLibrary website, located at http://ferc.gov/docs-filing/elibrary.asp, by searching Docket Number CP15-93 and Accession No. (20150223-5104).

[5] The FERC Plan and Procedures are a set of construction and mitigation measures that were developed in collaboration with other federal and state agencies and the natural gas pipeline industry to minimize the potential environmental impacts of the construction of pipeline projects in general. The FERC Plan and Procedures can both be viewed on the FERC Internet website at https://www.ferc.gov/industries/gas/enviro/guidelines.asp.

[6] Rover's Procedures are available on the FERC's eLibrary website, located at http://ferc.gov/docs-filing/elibrary.asp, by searching Docket Number CP15-93 and Accession No. (20150223-5104).

[7] Rover's Paleontological Discovery Plan is available on the FERC's eLibrary website, located at http://ferc.gov/docs-filing/elibrary.asp, by searching Docket Number CP15-93 and Accession No. (20150223-5104).

TABLE 2.3-1

Summary of Proposed Modifications to the FERC's Plan and Procedures

Applicable FERC Plan/Procedures Section	Resource Issue	Description	FERC Recommendation	EIS Section Discussed
Plan, at Section V.A.1	Cleanup timeframe following construction.	Proposal to exceed the 20-day timeframe for final grading, topsoil replacement, and installation of permanent erosion controls where dual pipe would be installed.	Acceptable.	2.2.1
Procedures, at Section I.B.1.d	Ditches.	Add definition for "ditches," not part of stream systems or naturally occurring, and as such do not fall under COE jurisdiction.	Acceptable.	4.4.4
Procedures, at Sections V.B.2.b and VI.B.1.a	Site-specific justification for each extra workspace area with less than 50 feet to the water's edge of a waterbody or wetland.	Proposal to identify locations where site-specific conditions at certain waterbody or wetland crossings would require extra workspace areas be located less than 50 feet from the water's edge.	Acceptable.	4.4.4
Procedures, at VI.A.3	Width of construction right-of-way within the boundaries of federally delineated wetlands.	Proposal to utilize construction rights-of-way beyond the recommended 75 feet within the boundaries of federally delineated wetlands due to the size of the pipeline and site-specific soil conditions.	Acceptable – Limited to Rover's requested 95-foot construction right-of-way width through forested wetlands for the Mainline A and B (see our recommendation in section 4.4.4 for non-forested wetlands along Mainlines A and B). Not Acceptable – the site-specific justifications for non-forested wetlands where the construction right-of-way would extend beyond the recommended 75 feet in federally delineated wetlands are not adequately justified.	4.4.3
Procedures, at VI.B.2.d	Wetland crossing procedures.	Proposal to trench wetland prior to pipe assembly under low-flow conditions or in unsaturated wetlands.	Acceptable.	4.4.3
Procedures, at VI.D.1	Vegetation clearing and maintenance.	Proposal to clear vegetation at a 30-foot-wide corridor where dual pipe would be installed.	Acceptable.	4.4.3

2.3.1 General Pipeline Construction Procedures

This section describes the general procedures proposed by Rover. Rover's primary pipeline construction technique in upland areas would be standard sequential assembly line installation (described below). Rover would have 15 of these assembly lines or "spreads" that would each be simultaneously completing construction activities at different locations along the route.

Rover has committed to minimize the duration for which the trench would be open. One way in which Rover would achieve this would be to postpone excavation until after the pipe has been strung, bent, and welded. Rover estimates that this would reduce the duration of an open trench from about 15 days to 4 days. However, Rover recognizes that certain construction conditions may not allow for this type of construction sequence; thus, the more conventional construction sequence is described below and applied throughout this analysis.

Other specialized construction methods, such as ripping and hammering methods used on steep side slopes, horizontal bore and HDD methods used to cross under sensitive resources, residential-specific methods, and procedures for crossing of waterbodies and wetlands, would also be used. These specialized construction methods are also described below.

Separate crews typically would be used for construction of the aboveground facilities. Construction procedures for aboveground facilities are described in section 2.3.3.

Survey and Staking

After Rover completes land or easement acquisition and before the start of construction, crews would mark the limits of the approved work areas (i.e., the construction right-of-way boundaries and extra workspace, the pipeline centerline, and approved access roads). Affected landowners would be notified prior to surveying and staking activities. Wetland boundaries and other environmentally sensitive areas identified in easement agreements or by federal and state agencies would be clearly marked with visible signage and fenced with erosion control devices for protection. The FERC Plan assigns duties to the applicants' environmental inspectors (EI) including "Verifying the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, waterbodies, wetlands, or areas with special requirements along the construction work area." Prior to construction, Rover would use the "Call Before You Dig" or "One Call" system for each state to verify and mark all underground utilities (e.g., cables, conduits, and pipelines) along the pipeline route to minimize the potential for accidental damage during construction.

Clearing Operations

Clearing would be required to remove trees, brush, and other existing vegetation from approved work areas. This would occur by mechanical means, including hydroaxes, a variety of bulldozers, bunchers, evacuators, mulcherheads, slashbusters, or bunching saws. Hand cutting with chain saws may also be used in specific areas as needed. Rover would fell trees during the winter season to minimize impacts on resident bat species. Trees felled during the winter season would be left in place in a manner that would not impede the flow of water in creeks or streams, until construction commences in the spring. Timber would be removed from the right-of-way and sold for lumber or pulp if suitable, disposed of at an appropriate receiving facility, or chipped on the right-of-way. Burning of cleared vegetation would be conducted where permitted, in such a manner that would minimize the fire hazard and protect surrounding vegetation from heat damage. Prior to construction, Rover would coordinate with the appropriate agencies to develop best management practices (BMPs) to prevent the spread of invasive species, noxious weeds, and soil pests during clearing or transport operations. Fences would be cut and braced along the right-of-way, with temporary gates for control of livestock and to limit public access. Mulch, including wood chips, would not be placed in agricultural areas, wetlands, or waterbodies.

Trees would be cut to grade and stumps would be removed only from the trenchline and working side of the construction right-of-way as needed. In wetlands, pulling of stumps would be limited to the trenchline and from the working side where it is deemed necessary for safety reasons (see section 2.3.2.1 for a description of stump removal in wetlands). Elsewhere in wetlands, stumps and rootstock would be left intact to promote revegetation following construction. Excavated stumps would be removed from the right-of-way for use as erosion control mulch, for disposal at approved locations, or made available to landowners upon request.

Closely following initial disturbance of soil, crews would install erosion control devices at the locations outlined in the CMPs. The CMPs also include specifications for installation and maintenance of temporary erosion controls such as soil, silt fence, straw bales, and temporary slope breakers (interceptor dikes), as well as permanent erosion controls such as permanent trench breakers, slope breakers, restoration methods, and revegetation measures. The EI would be responsible for ensuring that the erosion controls are installed correctly, inspected, and maintained in accordance with the CMPs.

Grading

Where necessary, the entire width of the construction right-of-way, including the temporary construction workspace, would be rough graded with bulldozers to allow for safe passage of equipment and to prepare the work surface for pipeline installation activities. Backhoes may be used in conjunction with bulldozers in areas where tree stumps, rock outcrops, and uneven topographic features need to be removed. A travel lane would be used to allow for the passage of daily construction-related traffic.

Topsoil stripping would occur in agricultural and residential lands and in other areas as requested by landowners. At least 12 inches of topsoil would be removed where the topsoil depth is greater than 12 inches and would be kept segregated from subsoil until replacement. The entire layer of topsoil would be removed in areas where topsoil is less than 12 inches deep, as determined by visual inspection. Rover would strip topsoil from the full right-of-way in uplands, including agricultural lands. Rover has developed an AIMP for Ohio and Michigan. These plans are discussed below.

Trenching

The trench would be excavated with a rotary trenching machine, backhoe, or track-mounted excavator to provide at least the minimum cover as required by 49 CFR 192. Trench depth would vary dependent upon the size of the pipe and cover requirements of the location. Typically, the trench would be sufficiently deep to provide for a minimum of 3 feet of cover over the pipeline. In certain areas, such as in agricultural land or at crossings of foreign pipelines and utilities, deeper burial would be required resulting in an increased trench depth. Rover’s proposed minimum specifications for depth of cover over the pipeline are listed in table 2.3.1-1. The Rover Project would cross underground utilities in numerous locations. Prior to construction, Rover’s contractors would contact the “One Call” system, or state or local utility operators, to verify and mark all underground utilities (e.g., cables, conduits, and pipelines) along the pipeline route for safety reasons and to minimize the potential for accidental damage during construction. In areas where the location is not apparent, utility lines would be located by field instrumentation and test pits.

TABLE 2.3.1-1 **Rover's Proposed Minimum Specifications for Depth of Cover**		
Location a	**Normal Soil (cover depth in inches)**	**Consolidated Rock (cover depth in inches)**
DOT PHMSA Class 1	36	36
DOT PHMSA Classes 2, 3, and 4	36	36
Land in agriculture	48	36
Drainage ditches of public roads or railroad crossings	60	36
Navigable river, stream, or harbor	60	36
Minor stream crossings	60	36

a As defined by the DOT Pipeline and Hazardous Materials Safety Administration (PHMSA) at 49 CFR 192.5.

Class 1: offshore areas and areas within 220 yards of a pipeline with ≤10 buildings intended for human occupancy.

Class 2: areas within 220 yards of a pipeline with >10 but <46 buildings intended for human occupancy.

Class 3: areas within 220 yards of a pipeline with >46 buildings intended for human occupancy and areas within 100 yards of either a building or a small, well defined outside area (such as a playground, recreation area, outdoor theater, or other place of public assembly) that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12-month period.

Class 4: areas within 220 yards of a pipeline where buildings with four or more stories are prevalent.

Spoil material excavated from the trench would be temporarily piled to one side of the right-of-way, adjacent to the trench. Subsoil would not be allowed to mix with the previously stockpiled topsoil, unless the landowner specifies otherwise. Where trench dewatering is needed, water would be discharged off the right-of-way into a well-vegetated upland area and/or into an approved filter. In the event that unanticipated contamination is encountered during construction, Rover would stop work and vacate the contaminated area. It would then notify the Chief Inspector of the contamination, and any equipment potentially contaminated would be kept onsite. Rover would collect information about the contamination and notify the agencies listed in Rover's Spill Procedures. Additionally, Rover has developed a Paleontological Discovery Plan and *Procedures Guiding the Discovery of Unanticipated Cultural Resources and Human Remains* (Rover's Unanticipated Discovery Plan)[8] should those features be discovered during trenching or construction.

Shallow Bedrock and Blasting

The Rover Project would cross numerous areas of shallow bedrock distributed along most of the route, as discussed in detail in section 4.1. Where bedrock is encountered along the pipeline route, it would be broken up and removed using one of the following methods. Rover anticipates that conventional, non-explosive methods would be used, including ripping with a dozer or hammering the rock with a pointed backhoe attachment before excavating it with a backhoe. During restoration, rock would be returned to a level no higher than the existing rock profile. Any excess rock would be disposed of at a landfill or recycling facility or would be used for other approved purposes within the right-of-way as allowed by the landowner and applicable permits.

[8] Rover's Unanticipated Discovery Plan is available on the FERC's eLibrary website, located at http://ferc.gov/docs-filing/elibrary.asp, by searching Docket Number CP15-93 and Accession No. (20150223-5104).

If rock cannot be removed by any of these techniques, blasting may be required to fracture the rock prior to its removal. Blasting would be performed under strictly controlled conditions designed to prevent potential damage to people and property (such as homes and wells) and to protect nearby environmentally sensitive resource areas from associated debris. Rover has proposed to offer both pre- and post-construction testing of water quality and quantity in wells and to identify any damages caused by construction. Minimum charges needed to perform the blasting would be used. Heavy mats may be used to prevent the scattering of debris, and blast monitoring would be conducted. Rover developed a Blasting Plan requiring coordination with appropriate agencies, dependent upon blasting location, to address the following: public notification prior to blast; pre- and post-blast inspections; and mitigation measures for groundwater, springs, and foundations, and other potential issues and impacts related to blasting (see section 4.1).

Rover also developed a Karst Mitigation Plan to address potential issues associated with the presence of shallow carbonate sedimentary (i.e., limestone) rock. This plan is also discussed in section 4.1. Rover would provide training to ensure that all personnel are aware of karst-like features, the potential to discover karst-like features during trenching operations, and the protocol for stop-work and supervisor notification should unanticipated karst features be discovered. EIs would monitor the construction spread for the duration of construction and would implement additional erosion and sediment controls to limit the flow of surface water runoff into the karst feature. The mitigation plan also includes provisions for the use of geotechnical specialists and geophysical or geotechnical testing as necessary to prevent or minimize potential impacts.

Pipe Stringing, Bending, and Welding

Once the trench is excavated, the next process in conventional pipeline construction is stringing the pipe along the trench. Stringing involves initially hauling the pipe by tractor-trailer, generally in 40-, 60-, or 80-foot lengths (joints), from the contractor yard onto the right-of-way. The pipe would be off-loaded from trucks and placed next to the trench using a sideboom tractor or similar equipment. Typically, several pipe joints are lined up end-to-end or "strung" to allow for welding into continuous lengths known as "strings." Individual joints would be placed on temporary supports or wooden skids and staggered to allow room for work on the exposed ends.

The pipe would be delivered to the contractor yards and work areas in straight sections. Some bending of the pipe would be required to enable the pipeline to follow the natural grade and direction changes of the right-of-way. Selected joints would be bent by track-mounted hydraulic bending machines as necessary prior to line-up and welding. Following stringing and bending, the individual joints of pipe would be aligned and welded together. All welding would be performed according to applicable 49 CFR Part 192, American Society of Mechanical Engineers, and American Petroleum Institute (API) standards as well as Rover's specifications. Only welders qualified to meet the standards of these organizations would be used during construction.

Every completed weld would be examined by a welding inspector to determine its quality, using radiographic or other approved methods as outlined in 49 CFR 192 and in accordance with API specifications. Radiographic examination is a non-destructive method of inspecting the inner structure of welds and determining the presence of defects. Welds that do not meet the regulatory standards and Rover's established specifications would be repaired or removed. After a weld is approved, the joint would be cleaned and epoxy coated. The coating on the remainder of the completed pipe section would be inspected and any damaged areas repaired.

Special tie-in crews would be used at some locations, such as at waterbody and road crossings, at changes in topography, and at other selected locations as needed. A tie-in is typically a relatively small segment of pipeline specifically used to cross certain features as needed. Once the pipeline segment is installed across the feature, the segment is then welded to the rest of the pipeline.

Lowering-in and Backfilling

Before the pipeline is lowered-in, the trench would be inspected to ensure that it is free of rocks and other debris that could damage the pipe or protective coating. Typically, any water that is present in the trench would be removed and pumped to a vegetated upland through an approved filter. The padding would consist of subsoil free from rocks greater than 1 inch and would surround the pipe along the bottom, both sides, and at the top. No topsoil would be used as padding material. Where there is not sufficient padding material onsite or when the native material that was excavated from the trench is not suitable backfill material (i.e., rocky), application of a protective coating (rock shield) or the acquisition of clean fill from other sources may be necessary.

After the pipe is lowered into the trench, all suitable material excavated during trenching would be re-deposited into the trench using bladed equipment or backhoes. If rock is excavated from the trench and subsequently used as backfill, it would not be allowed to extend above the soil horizon where it naturally is found. The top of the trench may be slightly crowned to compensate for settling. A caliper pig would run the length of the backfilled pipeline to identify any dents or damage that may have resulted from the construction or backfilling processes.

Cleaning and Hydrostatic Testing

After burial, the inside of the pipeline would be cleaned to remove any dirt, water, or debris inadvertently collected in the pipe during installation. Rover would inject a sufficient amount of water through the pipe to dispel any residual debris. Cleaning water would be disposed of in accordance with applicable permits and regulations.

The pipe would be hydrostatically tested to ensure that the system is capable of withstanding the operating pressure for which it was designed. Hydrostatic testing involves filling the pipeline with water and pressurizing the water in the pipeline for at least 8 hours to confirm the pipeline's integrity. The testing would be done in segments according to Rover's requirements and the DOT's specifications in 49 CFR 192. The exact sequence and timing of hydrostatic testing would depend on the final schedule for construction (see section 2.4).

Water for hydrostatic testing would potentially be obtained from streams, lakes, or rivers near the pipeline route. These waterbodies are discussed in more detail in section 4.3. Rover may reuse test water by transferring water from one test segment to another where practicable. Following testing, the water would be discharged, at a rate not to exceed 2,000 gallons per minute (gpm), into vegetated upland areas through a dewatering structure designed to slow the flow of water. All testing activities would be conducted within the parameters of the applicable water withdrawal and discharge permits.

Cleanup and Restoration

Where single pipe is installed, Rover would backfill the trench within 20 days of finish-grading of all work areas and would restore work areas to pre-construction contours and natural drainage patterns as closely as possible, weather permitting. Where dual pipe is installed, Rover's final grading and restoration would take place within 20 days of installation of the second pipe. Permanent slope breakers or diversion berms would be constructed and maintained in accordance with the CMP as needed. Fences, sidewalks, driveways, and other structures would be restored or repaired as necessary. If seasonal or other weather conditions prevent compliance with these timeframes, temporary erosion controls would be maintained until conditions allow completion of final cleanup.

Restoration activities would be conducted in accordance with state and municipal permit requirements. Soils that supported vegetation prior to construction would be revegetated using seed mixes, application rates, and timing windows recommended by local soil conservation authorities or other duly authorized agencies, landowner requests, and in accordance with the CMP. The right-of-way would be seeded within 6 working days following final grading, weather and soil conditions permitting, unless otherwise directed by local soil conservation authorities. Additionally, monitoring of revegetation after construction would be conducted to evaluate and correct areas requiring remediation.

Cathodic Protection

Rover would install cathodic protection equipment along the pipeline to prevent the corrosion of metal surfaces over time. Cathodic protection equipment could consist of cased deep well or conventional ground beds as described in section 4.12.

2.3.2 Special Construction Techniques

Construction involving wetlands, waterbodies, or construction across or within roads, highways, railroads, and streets, would require construction techniques that differ from the standard measures implemented in general areas. Rover's special construction techniques are summarized below.

2.3.2.1 Wetland Crossings

Rover's pipeline would cross palustrine forested, palustrine scrub-shrub, and palustrine emergent wetlands. Wetland resources are discussed in detail in section 4.4. Construction within, and restoration of wetlands would be performed in accordance with the wetland construction and mitigation measures contained in the CMP and Rover's Procedures.

Clearing of vegetation in wetlands would be limited to trees and shrubs, which would be cut flush with the surface of the ground and removed from the wetland. Stump removal, grading, topsoil segregation, and excavation would be limited to the area immediately over the trenchline in order to avoid excessive disruption of wetland soils and the native seed and rootstock within the wetland. A limited amount of stump removal and grading may also be conducted in other areas if dictated by safety-related concerns.

During clearing, sediment barriers such as silt fence and staked straw bales would be installed and maintained adjacent to wetlands and within temporary extra workspaces as necessary to minimize the potential for sediment runoff. Sediment barriers would be installed across the full width of the construction right-of-way at the base of slopes adjacent to wetland boundaries. If trench dewatering is necessary in wetlands, the trench water would be discharged into stable, vegetated, upland areas and/or filtered through a filter bag or siltation barrier in accordance with the CMP. No heavily silt-laden water would be allowed to flow into a wetland.

Construction equipment working in wetlands would be limited to that essential to clear the right-of-way, excavate the trench, fabricate and install the pipeline, backfill the trench, and restore the right-of-way. The specific method of construction used in wetlands would depend on the stability of the soils at the time of construction.

Standard pipeline construction, similar to construction methods described for uplands, may be conducted in non-saturated wetlands. In areas of saturated soils or standing water, no segregation of topsoil would occur, and low-ground-weight construction equipment and/or wooden mats would be used to reduce rutting and mixing of topsoil and subsoil and to facilitate movement of equipment within the wetland. In unsaturated wetlands and unfrozen wetlands, the top 12 inches of topsoil from the trenchline would be stripped and stored separately from the subsoil.

Rover intends to use an open-cut crossing method wherever appropriate, including where wetland soils are saturated and/or inundated. The open-cut technique is similar for inundated areas as in uplands, and involves stringing and welding the pipeline outside of the wetland and excavating the trench through the wetland using a backhoe supported by equipment mats. No attempt to inhibit the flow of water during trenching or installation procedures would be made. Pipe installed in saturated wetlands is typically coated with concrete or equipped with set-on weights to provide negative buoyancy. After the pipeline sinks to the bottom of the trench, a trackhoe working on equipment mats backfills the trench and completes cleanup. Trenchless construction techniques, such as horizontal bore and HDD, would also be used to cross under certain wetlands (see section 2.3.2.2).

Because limited grading would occur in wetlands, restoration of contours would be accomplished during backfilling. Prior to backfilling, trench breakers would be installed where necessary to prevent the subsurface drainage of water from wetlands. Where topsoil has been segregated from subsoil, the subsoil would be backfilled first, followed by the topsoil. Equipment mats, terra mats, and timber riprap used for equipment support would be removed from wetlands following backfilling.

For wetlands at the base of slopes, permanent interceptor dikes, slope breakers, and trench breakers would be installed in upland areas adjacent to the wetland boundary. Temporary sediment barriers would be installed where necessary until revegetation of adjacent upland areas is successful. Once revegetation is successful, sediment barriers would be removed from the right-of-way and disposed of properly. The right-of-way in wetlands would be a 10-foot-wide herbaceous strip centered over the pipeline.

2.3.2.2 Waterbody Crossings

Waterbody crossings would be constructed in accordance with federal, state, and local permits and the CMP. Surface water resources are discussed further in section 4.3.2, and aquatic resources are discussed in section 4.6.2. Discussion of potential impacts on fisheries resources, including agency consultations regarding construction timing restrictions, is also included in section 4.6.2. Rover has proposed to cross all waterbodies using either an open-cut or trenchless method (horizontal bore or HDD).

The open-cut crossing method is similar to the conventional upland open cut. The pipeline trench would be cut in-stream and no attempt to stop water flow would be made. The pipe would then be lowered into the trench, followed by backfilling. Backhoes and other evacuation equipment would be used to complete the trench and associated backfill. Depending on site conditions, equipment to complete the crossing may have to operate in-stream; however, the duration of such in-stream operation would be limited to the time required to complete the crossing. Trench crossing methods are described below.

Drainage features would also be open cut; however, the water in these systems would be temporarily re-routed or blocked with a trench plug to prevent run-off onto the right-of-way or downstream.

HDD is the preferred method proposed by Rover for major waterbody crossings and crossings of federally and state-designated waterbodies to reduce potential stream disturbance. HDD is a trenchless method that involves drilling a pilot hole along the pipeline path, enlarging it using a reaming tool, and following this with pre-assembled pipeline. Trenchless crossing methods are described below.

The pipeline crossings would typically require extra workspaces on each side of the waterbody to stage construction, fabricate the pipeline, and store materials. These extra workspaces would be located a minimum of 50 feet from the waterbody edge, except where the adjacent upland consists of actively cultivated or rotated cropland or where site-specific conditions require a reduced setback (see section 4.3.3 and appendix E).

Rover would install temporary equipment bridges over waterbodies. Bridges may include clean rock fill over culverts, equipment pads supported by flumes, railcar flatbeds, flexi-float apparatus, and other types of spans. These bridges would remain in place throughout construction until they are no longer needed. Each bridge would be designed to accommodate the highest expected flow for the time the bridge is in place and would be maintained to prevent soil from entering the waterbody. All construction equipment would be required to use the bridges, except for the clearing equipment needed for installation of the equipment bridges. The number of clearing equipment crossings of each waterbody prior to installation of the bridges would be limited to one piece of equipment, as specified in Rover's Procedures. Sediment barriers would be installed immediately after initial disturbance of the waterbody or adjacent upland. Sediment barriers would be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or when restoration of adjacent upland areas is complete and revegetation has stabilized the disturbed area.

Trench Crossing Construction Methods

Open-cut crossings of waterbodies involve conventional trenching, with no attempt made to alter the flow of water during construction activities. This construction technique is similar to the standard pipeline installation process described above for uplands. However, Rover identified it would complete construction and backfill within 24 hours for minor waterbodies (less than 10 feet wide) and within 48 hours for intermediate waterbodies (10 to 100 feet wide).

In response to our recommendation in the draft EIS, Rover has committed to cross waterbodies designated as coldwater fisheries and exceptional warmwater habitat by dry-ditch construction methods (see section 4.3). However, as discussed in sections 4.3.2 and 4.6.2, we are recommending that Rover cross all sensitive waterbodies with a dry-ditch crossing method, unless already being crossed using an HDD. The two typical types of dry-ditch crossings are the flume and dam-and-pump, described below. Thus, Rover would be required to use either of these methods (or could choose to propose an HDD or bore) to comply with our recommendation in section 4.3.2.5.

The flume method is a standard dry waterbody crossing method that involves diverting the flow of water across the construction work area through one or more flume pipes placed in the waterbody. The first step involves placing a sufficient number of adequately-sized flume pipes in the waterbody to accommodate the highest anticipated flow during construction. After the flume pipe(s) are placed in the waterbody, sand bags or equivalent dam diversion structures are installed in the waterbody upstream and downstream of the trench area. These devices serve to dam the stream and divert the water flow through the flume pipe(s), thereby isolating the water flow from the construction area between the dams. The flume pipe(s) and dams would remain in place during pipeline installation and until the final cleanup of the stream bed and bank is completed.

The dam-and-pump method is another standard dry waterbody crossing construction method that may be used as an alternative to the flume method. This method is similar to the flume crossing method, except that pumps and hoses are used instead of flumes to move water across or around the construction work area. The technique involves installing a pump upstream of the crossing and running a discharge hose from the pump across the construction area to a discharge point downstream of the construction area. After the pump is installed and operational, sandbags or equivalent dam diversion structures would be installed upstream and downstream of the trench area to isolate the water flow from the construction area between the dams. An energy dissipation device would be used to prevent scouring of the stream bed at the discharge location. Water flow would be maintained throughout the dam-and-pump operation until the pipeline is installed and banks are restored and stabilized.

Trenchless Crossing Methods

Horizontal boring consists of creating a tunnel-like shaft for a pipeline to be installed below roads, waterbodies, wetlands, or other sensitive resources without affecting the surface of the resource. Bore pits would be excavated on both sides of the resource to the depth of the adjacent trench and graded to match the proposed slope of the pipeline. A boring machine would then be used within the bore pit to tunnel under the resource or wetland by using a cutting head mounted on an auger, creating a horizontal hole approximately 2 inches larger in diameter than the pipe or casing. The auger would rotate and be advanced forward as the hole is bored. The pipeline would then be pushed through the bore hole and welded to the adjacent section of pipeline.

The HDD method would also avoid disturbing surface and shallow subsurface features (such as waterbodies, wetlands, vegetation, manmade structures, and public use and protected areas) between two construction areas and is the preferred method proposed by Rover for crossing major waterbodies. The HDD method typically involves establishing workspaces in upland areas on both sides of the feature(s) to be crossed and confining the work and equipment to these areas. The process commences with the drilling of a pilot hole in an arced path beneath the feature, using a drill rig positioned on the entry side of the crossing. When the pilot hole is completed, reamers are attached and are used to enlarge the hole in one or more passes until its diameter is sufficient to accommodate the pipeline. As the hole is being reamed, a pipe section long enough to span the entire crossing is fabricated (staged and welded) on one side of the crossing (typically the exit side) and then hydrostatically tested to ensure the integrity of the welds. When the reaming is complete, the prefabricated pipe section is pulled through the pre-reamed drilled hole back to the entry side.

A drill head equipped with a global positioning system (GPS) may be used to transmit the drill location to an operator in order to help guide the drill through the prescribed path. In cases where the drill head is not equipped with this technology, foot traffic would be required between HDD entry and exit points to place guide wires to track the progress and guide the movement of the drilling cutterheads. These guide wires would be placed in upland and wetland areas but would not be laid on the bed of any waterbodies.

HDD requires prefabricated pipeline, which may necessitate additional workspace if the right-of-way is not directly aligned with the HDD. Rover also proposes to clear a 10-foot-wide corridor between the HDD entry and exit holes, with disturbance in this area to be limited to surface impacts, including foot traffic and some small mechanical equipment such as all-terrain vehicles or backhoes. Access paths to the water source in support of drilling operations can typically be routed in a meandering fashion, thereby avoiding trees and any substantial clearing. In section 4.4, we recommend that Rover not clear any trees between the HDD entry and exit sites during construction. Minor brush clearing, less than 3 feet wide, using hand tools only is typically allowed to facilitate the use of the HDD tracking system or to acquire water for makeup of the HDD slurry.

Throughout the drilling process, a slurry of naturally occurring, non-toxic bentonite clay and water would be pressurized and pumped through the drilling head to lubricate the drill bit, remove drill cuttings, and hold the hole open. This slurry, referred to as “drilling mud” or “drilling fluid,” has the potential to be inadvertently released to the surface. The pipeline route would be monitored and the circulation of drilling mud would be observed throughout the HDD operation for indications of an inadvertent drilling mud release. If a release is observed or suspected, Rover would immediately implement corrective actions. The corrective actions that Rover would implement if it uses the HDD method, including the steps it would take to clean up and dispose of a release, are outlined in its HDD Plan, which is discussed in section 4.3.3.

It is possible for HDD operations to fail, primarily due to encountering unexpected geologic conditions during drilling or the pipe becoming lodged in the hole during pullback operations. Potential causes for abandoning a drill hole include the loss of drill bits or pipe down the hole due to a mechanical break or failure, a prolonged release of drilling mud that cannot be controlled, failure of the HDD pullback where a section of pipe cannot be retracted and has to be abandoned, or an inability to correct a severe curvature of the pilot hole drill path. In any event, reasonable attempts would be made to overcome the obstacles preventing successful completion of the drill. Such measures could include re-drilling the pilot hole in a slightly different location or re-conditioning of the pilot hole. Rover would be required to seek approval from the Commission and other applicable agencies prior to abandoning any proposed HDD crossing in favor of a new location, or using another construction method should the second attempt fail. If an HDD hole were to be abandoned, Rover would seal and grout with cement at least the upper 30 feet of the bore hole(s), with the top 5 feet filled with soil to allow for revegetation. In the event that an HDD crossing cannot be completed at the proposed location, Rover would coordinate with appropriate agencies and propose an alternative location to the FERC.

Geotechnical data testing pertaining to the feasibility of the proposed HDD crossings is ongoing. As recommended in section 4.1.1.4, Rover would be required to file any outstanding geotechnical studies prior to the start of drilling operations. If any of the proposed HDD crossings are found to be infeasible, Rover would be required to submit specific proposed alternate construction methods for review and approval by the Commission and other applicable agencies.

2.3.2.3 Typical Road and Railroad Construction Methods

The pipeline Project would cross numerous public or private roads and railroads. Two of the railroads that would be crossed are active and two are inactive, although one inactive railroad is used as a trail. These roads and railroads are listed in appendices H-1 and H-2, respectively, along with the proposed crossing method. Roads and railroads would be horizontally bored, open cut, or crossed by HDD. A description of the horizontal boring and HDD construction techniques is provided above. Open-cut road crossing methods are described below. The use of horizontal boring or HDD would avoid road and rail surface impacts, but the use of the open-cut crossing method would not. Road crossing permits would be obtained from applicable federal, state, and local agencies. These permits would dictate the specific requirements for the day-to-day construction activities and methods at each crossing.

Open-Cut Road Crossing Method

An open-cut method would be used where approved in the event that horizontal boring or HDD is not possible, or to cross privately owned roads. Rover does not anticipate the need to open cut any major roadways. Where paved road crossings are open cut, the pavement over the trench would be cut and removed. This would be followed by excavation of the trench and installation of the pipeline. To minimize the potential for impacts on existing utilities, Rover would use the “One Call” system in each state to have all underground utilities marked. In the event of a utility disturbance, full repair would be completed by Rover contractors. Trenching would typically be accomplished using a backhoe or trackhoe augmented by hand-shoveling where necessary to expose and protect existing utilities. If the roadway surface is paved, the pavement would be restored in accordance with the road crossing permit requirements. Gravel surfaces would also be repaired to as good as or better than pre-construction conditions following restoration.

Roadway excavation is anticipated to cause a 4- to 6-hour road closure. Measures to promote passage of emergency and other vehicles could include use of temporary travel lanes during construction or installation of steel plate bridges over the work area to allow traffic flow during open trenching. Traffic flow and access to homes would be maintained, except for the temporary periods when road blockage is unavoidable due to actual pipeline installation. In circumstances where traffic volumes are high or congested, Rover would use traffic safety personnel to direct traffic and ensure public safety.

2.3.2.4 Residential Areas

The proposed pipeline route crosses numerous residential properties and would pass within 50 feet of several properties. Residential structures within 50 feet of construction work areas are discussed in more detail in section 4.8.3.1; Rover has developed site-specific residential construction plans for these homes. Special care would be taken when residential areas are adjacent to construction activities to minimize neighborhood and traffic disruption, and to control noise and dust to the extent practicable.

In general, Rover indicated that, when working near or adjacent to residential areas, it would:

- maintain at least a 25-foot-wide buffer from any residence and the construction work area, where feasible;
- notify local residents in advance of construction activities;
- install safety fencing along the work areas for at least 100 feet on both sides of a residence and install additional fencing along the work boundary;
- preserve trees and landscaping, where possible;
- preserve and replace topsoil in lawns;
- restore affected structures such as fences, mailboxes, and gates;
- limit construction to daytime hours, except where special conditions require otherwise; and
- backfill the trench within 10 days and complete final cleanup within 10 additional days, weather permitting.

2.3.2.5 Winter Construction

Rover has proposed to place its Project into service in December 2016 although we acknowledge that this date is no longer feasible (see section 1.0 and section 2.4, below). Regardless, Rover would seek approval to begin construction as soon as all necessary federal, state, and local approvals and site access can be obtained. The current schedule may involve construction during winter 2016. Therefore, Rover has developed a WCP to address specialized methods and procedures that would be used to protect resources during the winter season. The key elements of the WCP include:

- clearing of snow from construction work areas for storage on the edge of the work areas, with minimal impacts on the surface soil, water, or ground;
- use of mulch and erosion control devices to stabilize topsoil and subsoil piles; and
- delaying final cleanup activities until soils have thawed.

We have reviewed Rover's WCP and have found it acceptable.

2.3.2.6 Federally and State-Owned Lands

Rover is proposing to cross two national scenic trails and two national scenic byways. Additionally one state-owned land in Michigan and five scenic byway roadways in Ohio would be crossed. No state-owned lands would be crossed in West Virginia or Pennsylvania. Rover has developed site-specific crossing plans which are discussed further in section 4.8.7.4.

2.3.2.7 Agricultural Lands

The Rover pipeline would cross numerous agricultural lands. Rover has developed state-specific plans (Rover's AIMP) to address potential impacts and mitigation for construction on agricultural lands in Ohio and Michigan. These plans are discussed in detail in section 4.8.4. Measures that would be used by Rover to prevent or minimize impacts on agricultural lands include:

- use of qualified professionals, including engineers, soil scientists, agronomists, and/or construction and environmental inspectors, to collect and analyze site-specific agricultural information;
- preservation, segregation, and replacement of topsoil across the full construction right-of-way;
- removal of rock (4 inches in size or larger) to a depth of 36 inches in Ohio and Michigan, the common freeze zone in both states;
- repair or replacement of drain tiles or irrigation systems damaged during construction; and
- initiation of a crop monitoring program to assess the yields of restored areas post-construction.

2.3.2.8 Rugged Topography

Rugged topography, such as steep, vertical slopes and steep side slopes (i.e., slopes running parallel to the proposed route), is present in some areas along the proposed pipeline route. Areas with steep slopes are identified in section 4.1 (see tables 4.1.1-1 and 4.1.3-3). A construction method used in areas with steep side slopes is often called the "two-tone" cut-and-fill method, and this method may be used when there is a lateral cross of the pipeline across the face of a slope. Typically, the up-slope side of the construction right-of-way is cut during grading, and the soil excavated from the cut is then used to fill the down-slope edge of the construction right-of-way in order to provide a safe and level working surface for heavy equipment. Pipeline construction then occurs on the level surface as it would in typical construction. During restoration, the spoil materials are placed back into the cut and compacted to match the original topography and contours. Rover would require extra workspace in these areas for storage of excavated material from the temporary cut-and-fill areas, as well as for temporary storage of material such as trench spoil, excess rock, and felled timber.

Erosion control fabric or revetments would be installed in the trench surrounding the pipeline in areas of steep slopes with high erosion potential and to prevent high-velocity channeling of water along the trench line, until adequate vegetation cover is established. Seeding and mulching would be performed in these areas to promote revegetation and slope stability.

2.3.3 Aboveground Facility Construction Procedures

Rover's proposed aboveground facilities include 10 new compressor stations, 19 new meter stations, 5 tie-in sites, a pig launcher, a pig receiver, mainline valves, and assorted ancillary facilities at various points along the proposed route (see table 2.1.2-1 above). Construction activities associated with these facilities would include installation of erosion controls, clearing, grading, installation of concrete foundations, fencing, small satellite dish assembly, pressure testing, and restoration grading and landscaping. Initial work at the meter stations would focus on preparing the sites for equipment staging, fabrication, and construction. Foundation holes and pipe trenches would be excavated with standard construction earthmoving equipment, as Rover does not anticipate the use of blasting for aboveground facility construction. Following foundation work, station equipment and structures would be brought to the site and installed, using any necessary trailers or cranes for delivery and installation. Following installation of the facilities, associated equipment, piping, and electrical systems would be installed, and the sites would be graveled, as necessary, and fenced. Necessary equipment testing and start-up activities would occur on a concurrent basis.

2.4 CONSTRUCTION SCHEDULE

As part of their applications, Rover, Panhandle, and Trunkline originally proposed an in-service date of December 2016 for portions of the Projects, which would necessitate starting construction in early 2016, continuing into 2017. However, we acknowledge that this schedule is no longer feasible. Following the completion of construction, the applicants would request to place the facilities into service after a determination is made by the FERC staff that restoration is proceeding satisfactorily. We expect that an in-service request would follow shortly after the end of construction. The applicants would seek to begin construction of their Projects dependent upon:

- whether the Commission decides to authorize a Certificate;
- subsequent acquisition of additional survey access and easement agreements;
- completion of field surveys and submittal of permit applications;
- receipt of all necessary federal, state, and local authorizations;
- other Project-specific requirements such as waterbody, migratory bird, and rare bat construction window restrictions (see sections 4.3.3, 4.6, and 4.7);
- satisfaction of all pre-construction conditions of any Certificate issued for the Projects; and
- the FERC's separate, post-Certificate authorization that construction may begin.

Rover anticipates a peak work force of 14,225 construction workers, of which approximately 50 percent, or roughly 7,112 workers would be local hires (i.e., individuals already residing in the Rover Project area or employed by local union halls). Most of the estimated 50 percent of non-local workers would relocate to the Rover Project area and would stay in temporary housing in the vicinity of the Rover Project.

For the Panhandle and Trunkline Projects, the applicants expect to use 40 workers for construction at any one site, with 25 percent of the workforce expected to be local. The remaining 75 percent of workers would be non-local hires who would lodge in temporary housing in the vicinity of the construction sites.

2.5 ENVIRONMENTAL COMPLIANCE INSPECTION AND MITIGATION MONITORING

2.5.1 Coordination and Training

The applicants would incorporate the mitigation measures identified in their permit applications, as well as additional requirements of federal, state, and local agencies, into their construction drawings and specifications. The applicants would also provide copies of applicable environmental permits and construction drawings and specifications to their construction contractors.

Each of the applicants would develop environmental training programs tailored to the respective proposed Project and the requirements for each. The programs would be designed to ensure that:

- qualified environmental training personnel provide thorough and focused training sessions regarding the environmental requirements applicable to the trainees' activities;
- all individuals receive environmental training before they begin work on any construction workspaces;
- adequate training records are kept; and
- refresher training is provided as needed to maintain high awareness of environmental requirements.

The applicants would also conduct training for construction personnel regarding proper field implementation of Rover's Plan and Procedures for the Rover Project and the FERC Plan and Procedures for the Panhandle and Trunkline Projects, and other Project-specific plans and mitigation measures.

2.5.2 Environmental Inspection

Rover would be represented on the Rover Project by a Chief Environmental Inspector, and one Lead Environmental Inspector would be assigned to each construction spread.[9] Rover would also employ full-time EIs, including agricultural inspectors (AI), for each construction spread during construction. Rover would train the EIs in the implementation of its Plan and Procedures and other mitigation measures as described in its CMPs (see appendix G). The EIs would report directly to Rover's Environmental Compliance Manager. The duties of an EI would include ensuring compliance with environmental conditions attached to the FERC Certificate and other agency permits. The EIs would be onsite during active construction and would have peer status with all other activity inspectors. The EI would have authority to stop construction activities that violate the measures set forth in the documents and permit authorizations for the Rover Project, as well as authority to order corrective actions. At a minimum, the EI would be responsible for:

- ensuring compliance with the measures set forth in Rover's CMPs and all other environmental permits and approvals, as well as environmental requirements in landowner agreements;
- identifying, documenting, and overseeing corrective actions as necessary to bring an activity back into compliance;
- verifying that the limits of authorized construction work areas and locations of access roads are properly marked before clearing;
- verifying the location of signs and highly visible flagging to mark the boundaries of sensitive resource areas, waterbodies, wetlands, or areas with special requirements along the construction work area;
- identifying erosion/sediment control and stabilization needs in all areas;

[9] A "spread" is an individual segment of the overall Project staffed by its own labor and equipment. The Rover Project would consist of 15 spreads.

- locating dewatering structures and slope breakers to ensure that they would not direct water into sensitive areas, such as known cultural resource sites or sensitive species habitat;
- verifying that trench dewatering activities do not result in deposition of sand, silt, and/or sediment near the point of discharge in a wetland or waterbody. If such deposition is occurring, the EI would stop the dewatering activity and take corrective action to prevent a reoccurrence;
- advising the Chief Construction Inspector when conditions (such as wet or frozen weather) make it advisable to restrict construction activities to avoid excessive rutting;
- approving imported soils and verifying that the soil is certified free of noxious weeds and soil pests, unless otherwise specified by the landowner;
- determining the need for and ensuring that erosion controls are properly installed, as necessary, to prevent sediment flow into wetlands, waterbodies, and sensitive areas, and onto roads;
- inspecting and ensuring the maintenance of temporary erosion control measures at least daily in areas of active construction or equipment operation, on a weekly basis in areas with no construction or equipment operation; and within 24 hours of each 0.5 inch or greater of rainfall;
- ensuring restoration of contours and topsoil;
- ensuring the repair of all ineffective temporary erosion control measures as soon as possible but not longer than 24 hours after identification;
- ensuring that subsoil and topsoil are tested in agricultural and residential areas to measure compaction and determine the need for corrective action;
- keeping records of compliance with conditions of all environmental permits and approvals during active construction and restoration; and
- identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase. Rover would also employ an AI, who would ensure that construction within agricultural areas or areas that could affect agricultural resources meets permit requirements.

Rover would also employ Chief Construction Inspectors and one or more Craft Inspectors for each spread. The purpose of these inspectors would be for quality assurance and compliance with mitigation measures, as well as other applicable regulatory requirements and Rover specifications.

Similarly, Panhandle and Trunkline would employ Contractor superintendents to oversee construction activities.

2.5.3 FERC Third-Party Compliance Monitoring

Rover has agreed to fund a FERC third-party compliance monitoring program during the Rover Project construction phase. Under this program, a contractor is selected by, managed by, and reports solely to the FERC staff to provide environmental compliance monitoring services. The FERC Compliance Monitor would provide daily reports to the FERC on compliance issues and make recommendations to the FERC Project Manager on how to deal with compliance issues and construction changes, should they arise. In addition to this program, FERC staff would also conduct periodic compliance inspections during all phases of construction and throughout restoration, as necessary.

2.5.4 Post-Approval Variance Process

The pipeline alignment and work areas identified in this EIS should be sufficient for construction and operation (including maintenance) of the Projects. However, minor route realignments and other workspace refinements sometimes continue past the Project planning phase and into the construction phase. These changes could involve minor route realignments, shifting or adding new extra workspaces or staging areas, adding additional access roads, or modifications to construction methods. We have developed a procedure for assessing impacts on those areas that have not been evaluated in this draft EIS and for approving or denying their use following any Certificate issuance. In general, biological and cultural resources surveys were conducted using a survey corridor larger than that necessary to construct the facilities. Where survey approvals were denied, Rover would complete the required surveys following a Certificate issuance. If the applicants request to shift an existing workspace or require a new extra workspace subsequent to issuance of a Certificate, these areas would typically be within the previously surveyed area. Such requests would be reviewed using a variance process.

A variance request for route realignments or extra workspace locations, along with a copy of the survey results, would be documented and submitted to either the onsite compliance monitors or to the FERC in the form of a "variance request" in compliance with recommended condition number 5 in section 5.2 of this EIS. Minor variance requests, such as new workspace within the previously surveyed corridor that would not require tree clearing or impacts on sensitive resources, would be reviewed by the compliance monitor and could be approved in the field if deemed necessary and acceptable. For larger or more complex variance requests, the FERC would take the lead on reviewing and making a final determination on the request. Typically, no further resource agency consultation would be required if the requested change is within previously surveyed areas and no sensitive environmental resources are affected.

The procedures used for assessing impacts on work areas outside the survey corridor and for approving their use are similar to those described above, except that additional surveys, analyses, and resource agency consultations would be performed to assess the extent of any impacts on biological, cultural, and other sensitive resources and to identify any avoidance or minimization measures necessary. All variance requests for the Projects and their approval status would be documented according to the FERC's compliance monitoring program as described above. Any variance activity by any of the applicants (whether submitted through the third-party compliance monitoring program or directly to the FERC) and subsequent FERC action would be available on the FERC's e-library webpage under the docket number for the respective Project (CP15-93, CP15-94, or CP15-96).

After the applicants complete any additional surveys, landowner consultation, analyses, and/or resource agency consultations, the new work area and supporting documentation (including a statement of landowner approval) would be submitted to the FERC in the form of a formal variance request, which would be evaluated in the manner described above for approval or denial.

2.5.5 Post-Construction Monitoring

After construction, the applicants would conduct follow-up inspections of all disturbed upland areas after the first and second growing seasons to determine the success of restoration. Restoration of upland areas would be considered successful if the right-of-way vegetation is visually successful in density and cover, surface conditions are similar to adjacent undisturbed lands, construction debris is removed, and proper drainage has been restored. For at least 2 years following construction, the applicants would submit quarterly reports to the FERC that document any problems identified by Rover, Panhandle, Trunkline, or landowners and describe the corrective actions taken to remedy those problems. The applicants would perform monitoring for invasive plant species following construction. However, we are recommending in section 4.5 that the applicants extend the monitoring of invasive species for a period of 5 years following successful revegetation as determined by the Commission's post-construction inspections. The monitoring period for invasive species would be extended as needed or as required by permits or regulatory agencies.

In accordance with Rover's CMP and the FERC Procedures, the applicants would monitor the success of wetland revegetation annually for the first 3 years (or as required by permit) after construction or until wetland revegetation is successful. Wetland revegetation would be considered successful when the cover of herbaceous and/or woody species is at least 80 percent of the type, density, and distribution of the vegetation in adjacent undisturbed wetland areas or as compared to documented, pre-Project conditions. In accordance with its Procedures, if revegetation is not successful at the end of 3 years, the applicants would develop and implement (in consultation with a professional wetland ecologist) a plan to actively revegetate the wetland with native wetland herbaceous and woody plant species.

After construction of the Rover Project, the FERC, cooperating agencies, and/or other agencies would continue to conduct oversight inspections and monitoring to assess the success of restoration. If it is determined that the success of any of the restoration activities are not adequate at the end of the respective timeframes, Rover would be required to extend its post-construction monitoring programs.

2.6 OPERATION, MAINTENANCE, AND SAFETY CONTROLS

The applicants would operate and maintain the proposed pipeline and/or aboveground facilities in compliance with the DOT's regulations provided in 49 CFR 192, the Commission's guidance at 18 CFR 380.15, and the maintenance provisions of Rover's Plan and Procedures for the Rover Project and the FERC Plan and Procedures for the Panhandle and Trunkline Projects. Rover would operate and maintain the newly constructed pipeline facilities in the same manner as it currently operates and maintains its existing systems. The pipeline right-of-way would be patrolled by either aerial flyovers or ground surveys, although additional ground surveys would be conducted as necessary.

The new pipeline would be patrolled to identify:

- erosion concerns occurring along the right-of-way;
- the performance status of erosion control devices;
- third-party activity along the pipeline right-of-way;
- the condition/success of vegetation and plantings; and
- any other conditions that could threaten the pipeline.

Designated personnel for the respective applicants would be notified by its inspectors of any conditions that need attention. Corrective measures would be performed as needed. Aboveground facilities such as meter stations and mainline valves would also be inspected to ensure proper working conditions. Rover's pipeline cathodic protection system would also be monitored and inspected periodically to ensure proper and adequate corrosion protection.

Maintenance of the Rover pipeline permanent right-of-way in uplands generally would consist of mowing once every 3 years. However, Rover may mow a 10- or 30-foot-wide strip centered over the pipeline (the larger width being associated with locations where the dual pipelines would be installed) in upland areas and a 10-foot-wide strip in wetland areas (with the exception of HDD segments), along with selective cutting and removal of trees and shrubs within 15 feet of the pipelines whose roots could compromise the pipeline integrity and to facilitate inspections. All workspaces affected temporarily during construction would be stabilized and seeded, and then allowed to eventually revert back to pre-Project conditions.

The pipeline facilities would be clearly marked at line-of-sight intervals and at crossings of roads, railroads, waterbodies, and other key points. The markers would indicate the presence of the pipeline and provide a telephone number and address where a company representative could be reached in the event of an emergency or before any third-party excavation in the area of the pipeline. The applicants would participate in the “One Call” programs in the respective Project areas.

Rover would also inspect and maintain the proposed compressor station facilities, including calibrating equipment; assessing cathodic protection systems; checking safety systems; and monitoring pressures, temperature, and vibration data. Rover would also mow and maintain the landscaping around the compressor station.

2.7 FUTURE PLANS AND ABANDONMENT

Rover currently has not identified nor is currently proposing any plans for future expansion of its Project. Rover states that, at the end of the Rover Project life cycle, it would abandon all Rover Project facilities. At the time of abandonment, Rover would be required to seek specific authorization from the FERC for that action. The public would have the opportunity to comment on the abandonment proposal.

Panhandle and Trunkline currently have not identified, nor are they currently proposing, any plans for future expansion or abandonment of their respective Projects.

3.0 ALTERNATIVES

In accordance with NEPA and our policy, we evaluated alternatives to the Projects. The purpose of this evaluation is to determine whether there are reasonable alternatives that would result in less environmental impact than the Projects as proposed while still meeting the Projects' objectives. As described in section 1.1, Rover indicated that the Rover Project objectives were to:

- move natural gas from producers' processing plants or interconnections in Pennsylvania, West Virginia, and Ohio to interconnections with certain Midwest pipeline interconnections in Ohio and Michigan;
- transfer up to 3.25 Bcf/d of natural gas supply from the Marcellus and Utica Shale producers in Pennsylvania, West Virginia, and Ohio through interconnections with existing pipeline infrastructure in Ohio and Michigan to supply interstate natural gas pipelines and storage facilities as well as markets in the Gulf Coast, Midwest, and Canadian regions;
- increase the diversity of supply through bi-directional metering to allow access to the East Coast, Gulf Coast, and Chicago markets and offset the reduction of available gas supply from traditional supply areas that historically served Ohio and Michigan; and
- provide local Midwest gas consumers with access to readily available, stable, and competitively priced gas supply for local distribution companies connected to the Rover Project.

Panhandle stated that the purpose of its Project is to construct and operate the system modifications that would allow Panhandle to meet the new demand for east-to-west transportation and still maintain its existing obligations from west-to-east contracts. The Panhandle Project would increase capacity on its system to accommodate the increase being delivered from the Rover Project.

Trunkline stated that the purpose of its Project is to modify and update existing facilities to provide bi-directional transmission of natural gas from the Midwest to the Gulf Coast region. These updates would allow Trunkline to provide service to Rover using the increased capacity from the bi-directional flows.

The alternatives to the proposed actions that we address in this section include the no-action alternative, system alternatives, route alternatives, minor route variations, and aboveground facility site alternatives.

We established several key criteria to evaluate the potential alternatives identified. Each alternative was evaluated in consideration of whether or not it would:

- meet the Projects' objectives, as described above;
- be technically and economically feasible and practical; and
- offer a significant environmental advantage over the proposed action.

With respect to the second criterion, it is important to recognize that not all conceivable alternatives are technically feasible and practical. For example, some alternatives may not be possible to implement due to technological difficulties or logistics, or be so cost-prohibitive as to render a project non-viable. The FERC does not design natural gas pipeline projects. Rather, pipeline companies propose and design pipeline projects in response to market conditions. In turn, we analyze these proposals and a reasonable range of alternatives. In conducting this analysis, it is important to recognize the environmental advantages and disadvantages of a proposed action in order to focus the analysis on reasonable alternatives that may reduce impacts and offer a significant environmental advantage. A detailed discussion of the environmental consequences of the proposed Projects (both positive and negative) is included in section 4.0.

Using the evaluation criteria discussed above and subsequent environmental comparisons, each alternative was considered to the point where it was clear that the alternative was not reasonable, would result in substantially greater environmental impacts that could not be readily mitigated, offered no potential environmental advantages over the proposed Projects, or could not meet the Projects' objectives. Alternatives that appeared to result in less than or similar levels of environmental impact were reviewed in greater detail. The following sections discuss and analyze each of the alternatives evaluated in sufficient detail to explain why they were eliminated from further consideration or are recommended for adoption into the respective Project.

For environmental data presented within this alternatives analysis, we use data collected from desktop sources (e.g., maps, literature, aerial photography, and agency databases). Rover collected field survey data for its proposed route and some (but not all) alternatives. Therefore, to present the most consistent comparisons of potential impacts on environmental resources, this section presents data obtained from desktop sources for both the proposed route and alternative routes, even when field data may exist.

We evaluated both quantitative and qualitative data in our analyses of alternatives. Subjective assessments were also used to evaluate numerous disparate parameters that are either difficult or impossible to unify into a simple decision-making method for an alternatives analysis. These parameters do not always have equal weight in the assessment, with factors such as overall disturbance (segment length, amount of acreage to be disturbed), longer-term impacts (forest impacts), impacts on federally or state-regulated resources (streams and wetlands – particularly forested wetlands), or affecting safety or constructability (side slope construction). Factors with longer-term impacts or impacts on sensitive resources generally carry more weight than factors with short-term impacts (agricultural row crops or hayfields), non-regulated resources, or certain other factors.

During the preliminary design stage for the Rover Project, the applicant participated in our pre-filing process (see section 1.3). This process emphasizes identification of potential stakeholder issues early in the development of a project, as well as identification and evaluation of alternatives that may avoid or minimize these issues. During this process, Rover made multiple modifications to its proposed pipeline route to address stakeholder concerns. The majority of route changes were made to avoid or minimize conflicts with existing or planned land uses, including agricultural areas, or to route the pipeline off of or increase the distance from residential and commercial businesses, recreation areas, nature preserves or other infrastructure. These changes were subsequently made part of Rover's proposed route when it filed its FERC application and supplements.

3.1 NO-ACTION ALTERNATIVE

The Commission has two courses of action to process applications under Section 7 of the NGA: (1) deny the requested action (the no-action alternative); or (2) grant the Certificate with or without conditions. If the no-action alternative is selected by the Commission, the proposed facilities would not be constructed and the short- and long-term environmental impacts from the Projects would not occur. In addition, if the no-action alternative is selected, the stated objectives of the applicants' proposals would not be met. The no-action alternative would eliminate the additional means to move production to markets in the Midwest and Canada; deny Midwest consumers access to readily available, stable, and competitively priced gas supply; and decrease diversity of supply. As a result, the no-action alternative would cause suppliers of natural gas to pursue other means of natural gas transport, and users would need to rely on other fuels (such as heating oil) or seek other means to meet or curtail their energy needs, which could result in increased natural gas prices in the market areas due to less available supplies.

Production of natural gas is estimated to increase 45 percent from 24.4 trillion cubic feet in 2013 to 35.5 trillion cubic feet in 2040 (DOE/EIA, 2015a). This increase is primarily attributed to a rise in shale gas production in the lower 48 states. The Marcellus and Utica Shale areas of West Virginia, Pennsylvania, and Ohio will produce significant volumes of gas, which will be stranded from domestic and Canadian markets under the current infrastructure. The purpose of the Rover Project is to connect stranded gas from Marcellus and Utica Shale areas to processing facilities in the Gulf Coast, Midwest, and Northeast, for redelivery to U.S. and Canadian markets.

The lack of a new pipeline with access to supply sources into the region could prolong existing supply constraints in the proposed delivery areas, which could create winter-premium pricing and exacerbate price volatility for all natural gas users in the areas. Additionally, this could increase the difficulty for others, such as the operators of gas-fired electric generating plants, to find economical gas supplies. This, in turn, could lead to higher gas and electric rates in the region and could lead to energy shortages during times of winter peak demand.

Production of natural gas has historically been greatest along the Gulf Coast, but due to declines in production from shale formations in that region, such as the Haynesville Shale formation in Texas, flow of natural gas is now mostly from northern shale regions to western and southern markets (DOE/EIA, 2015a; Pentland, 2014). Gas from the Marcellus and Utica Shale regions would compensate for this reduction in gas supplies. Ohio and Michigan are the 8th and 9th largest consumers of natural gas relative to the 50 states, respectively, but both are net importers of natural gas to meet needs for industrial, commercial, and residential consumption. However, supplies from the Gulf of Mexico have decreased by approximately 46 percent in the last 5 years (DOE/EIA, 2015a). Rover estimates that 78 percent of the natural gas moved through the Rover Project would be supplied to U.S. markets, including several local utilities and storage areas in Ohio and Michigan.

The burning of natural gas at power plants to produce electricity also results in reduced air emissions compared to other fossil fuels, such as coal and fuel oil. According to the EPA (2013), natural gas produces at least 50 percent less carbon dioxide (CO_2), almost 70 percent less nitrogen oxides (NO_X), and about 99 percent less sulfur oxides compared to a coal-fired power plant. A number of coal-fired plants in the Midwest and Northeast have closed since November 2013, including three Consumers Energy coal-fired power plants (947 megawatts [MW]) (DOE/EIA, 2014). Coal-fired facilities are being retired by their operators for several reasons, including the need to comply with the EPA's *Mercury and Air Toxics Standards*, weak electricity demand growth, and continued competition from generators fueled by natural gas (DOE/EIA, 2014). If the no-action alternative is adopted, air emissions may be increased if other sources of energy were to be used.

The no-action alternative would not provide the potential economic benefits associated with the proposed Projects, including increased jobs, secondary spending, and tax revenues during construction, as well as increased property tax revenues to local governments during operations as discussed in section 4.9. Further, the no-action alternative would not provide additional natural gas service to consumers and municipalities in Ohio and Michigan or other interstate pipelines. The above-mentioned transition in energy sources in the Rover Project areas has been hastened by the relatively lower cost of natural gas, which has economic and cost savings benefits that are then passed along to consumers of electricity.

In summary, the no-action alternative would avoid the environmental impacts of the proposed Projects, but it would not meet the objectives of the proposed Projects and would likely result in the need for alternate means to satisfy the demand for natural gas or other sources of energy in the Midwest and beyond. End users then may seek energy from other sources including other fossil fuels and renewable energy that could also lead to increased energy conservation.

3.1.1 Energy Conservation and Energy Efficiency

Energy conservation measures have played and will continue to play an important role in reducing energy demand in the United States. The Energy Policy Act of 2005 includes guidelines to diversify America's energy supply and reduce dependence on foreign sources of energy, increase residential and businesses' energy efficiency and conservation (e.g., EPA Energy Star Program), improve vehicular energy efficiency, and modernize domestic energy infrastructure (U.S. Congress, 2005).

West Virginia, Pennsylvania, Ohio, and Michigan have adopted initiatives that promote energy efficiency and conservation. The details for the legislation and effectivity of the programs varies from state to state, as described below.

The West Virginia State Energy Plan (WV Energy Plan) provides recommendations to foster an innovative clean energy economy. These recommendations include both fossil and renewable energy sources, with the goal of providing analysis of future energy needs in a cost-effective and sustainable manner (West Virginia Division of Energy, 2015). According to the WV Energy Plan, West Virginia has the highest residential energy consumption per household when compared to all other Appalachian states, and has the lowest energy efficient efforts in the region. The WV Energy Plan provides policy recommendations to the state and the utility public service commission to become more energy efficient. In addition, the West Virginia Division of Energy provides energy services to businesses, communities, and homeowners, and promotes the development of new energy sources through formulation and implementation of fossil energy, renewable energy, and energy efficiency programs.

Pennsylvania fosters expansion of the energy market, as the state's energy policies equate domestic energy production with job creation. A component of the state's core energy values is the protection of the environment and is reflected by the passing of Act 129 by the Pennsylvania General Assembly in 2008, which required that any Pennsylvania Electric Distribution Company with more than 100,000 customers adopt an energy efficiency and conservation program. As of 2013, Act 129 has resulted in an energy savings of 3.5 million MW hours and a reduction in peak demand of 500 MW. The state is an advocate for providing affordable and domestic energy to consumers. Started in June 2013, the Pennsylvania Public Utility Commission directed the development of plans to reduce electricity usage for 3 years.

The Ohio Revised Code, Title 49, chapter 4928 contains an alternative energy portfolio standard, which states that, by 2027, at least 25 percent of Ohio's energy must be provided from alternative energy sources. The legislation incorporates the use of renewable energy credits and requires that at least half of the alternative energy standard (12.5 percent) must come from renewable sources such as wind, solar, and hydropower. The remaining 12.5 percent can be derived from alternative energy sources such as nuclear power plants, fuel cells, and clean coal technology. The Renewable Energy Portfolio Standard has set annual, incremental percentage requirements for utility providers through 2027 and stipulates continuation of the 25 percent energy portfolio standard thereafter.

Michigan adopted a Renewable Energy Standard per the Public Act 295, passed in 2008, which sets energy savings targets for energy service providers. In an effort to meet these targets, utility providers started to offer energy savings programs in 2009. As of 2012, electricity providers have exceeded the energy efficiency goal and have met 125 percent of the Energy Optimization goal. In addition to the Renewable Energy Standard, *Michigan's 21st Century Electric Energy Plan* supports the integration of renewable resources into the state's energy supplies, and projects Michigan's electric needs through 2027

(Lark, 2007). The plan also outlines the creation and implementation of energy efficiency programs statewide.

3.1.1.1 Combined Heat and Power

Combined heat and power (CHP), also known as cogeneration, accounts for almost 12 percent of electrical power generation in the United States (U.S. Clean Heat and Power Association, 2015). CHP is the simultaneous production of electricity and heat from a single fuel source, such as natural gas, biomass, biogas, coal, or oil. CHP is not a single technology, but an energy system that can be modified depending on the needs of the energy end user. CHP systems consist of a number of individual components configured into an integrated whole to recover and use waste heat from the production of electricity. These components include the prime mover, generator, heat recovery equipment, and electrical interconnection. The prime mover drives the overall system and typically includes reciprocating engines, combustion turbines, steam turbines, microturbines, and fuel cells (EPA, 2011a). In the United States, CHP decreases energy use by about 1.3 trillion British thermal units (Btus) per year and contributes to overall reductions in NO_X and sulfur dioxide (SO_2) emissions (U.S. Clean Heat and Power Association, 2015).

Recently, the EPA evaluated the opportunity for the use of CHP at wastewater treatment facilities and found that, as of June 2011, wastewater treatment CHP systems were in place at 133 sites in 30 states, representing 437 MW of capacity (EPA, 2011a). Although 78 percent of the facilities identified rely solely on biogas from on-site anaerobic digesters, some facilities use other fuel sources (e.g., natural gas or fuel oil) either because the facility does not use anaerobic digesters or because biogas is not a practicable option due to site-specific technical or economic conditions. Wastewater CHP systems typically work best when used at facilities with influent flow rates of 5 million gallons per day (mgd) or more (EPA, 2011a). This is because waste stream volumes this large are typically required to produce sufficient quantities of biogas to make CHP usage economically feasible. The EPA's 2011 study examined the potential for increasing CHP use at wastewater treatment facilities with influent rates of at least 1 mgd. Smaller wastewater facilities that use anaerobic digesters can produce sufficient biogas through conventional means (given high enough biosolids loadings) or augment their digester process to raise the biogas generation rate (e.g., addition of collected fats, oils, and greases; use of microbial stimulants). About 37 percent of the wastewater treatment facilities with influent flows of 1 to 5 mgd and using anaerobic digestion processes are candidates for deployment of CHP (EPA, 2011a). If all of these facilities instituted CHP, an additional 54 MW per day of electrical generation and 4,997 million Btu per day of thermal energy could be produced nationally.

While the Energy Policy Act of 2005 and these other state and municipal programs promote increased energy efficiency and conservation by supporting new energy-efficient technologies (such as CHP) and increasing funds for energy efficiency research, and would no doubt minimize energy use, they are not expected to eliminate the increasing demand for energy or natural gas. Additionally, the implementation and success of energy conservation in curtailing energy use is a long-term goal, extending well beyond the timeframe of the proposed Projects.

Projections by the DOE's Energy Information Administration (EIA) support this conclusion. According to the *Annual Energy Outlook 2015 with Projections to 2040* (DOE/EIA, 2015b) reference case, despite increased efficiency, natural gas consumption is expected to grow from 26.1 quadrillion Btu per year in 2012 to 30.5 quadrillion Btu per year in 2040.

While energy conservation reduces demand for energy sources such as natural gas, and may be a long-term alternative or partial alternative for the Projects, implementation of sufficient energy conservation measures to eliminate the need for the proposed Projects is not feasible in the short-term. As such, we do not consider energy conservation or energy efficiency a practicable alternative to the proposed Projects, and they were eliminated from further analysis.

3.1.1.2 Renewable Energies

The Commission also received numerous comments suggesting that electricity generated from renewable energy sources could eliminate the need for the Rover Project and that the use of these energy sources, as well as gains realized from increased energy efficiency and conservation, should be considered as alternatives to the Rover Project. Renewable energy projects planned or proposed in the region would help to diversify the electricity market in the regions, thus helping to protect consumers from potentially volatile fossil fuel prices and assisting regions with achieving their renewable portfolio standard goals. Accordingly, while these renewable energy projects would benefit the energy market by diversifying the array of fuels used to generate electricity, they are not expected to meet consumers' overall electricity needs. Moreover, renewable energy is not completely interchangeable with natural gas. Most renewable energy sources are used to generate electricity. While natural gas is used for this purpose, it is also used for space heating and cooking. Although these uses could be served by electricity instead of natural gas, existing natural gas-based heating and cooking systems would need to be converted to electric-based systems, which may be prohibitively expensive for many consumers. Additionally, moving electricity from the point of generation to consumers may require major investment in electric transmission lines as well as other additional infrastructure costs. Also, the development of the renewable projects and the associated transmission lines would have potentially adverse effects on air, water, ecological values, and other resources.

Further, the general purpose of the Projects is to transport natural gas supply from the Marcellus and Utica Shale producers in Pennsylvania, West Virginia, and Ohio through interconnections with existing pipeline infrastructure in Ohio and Michigan to supply interstate natural gas pipelines and storage facilities as well as markets in the Gulf Coast, Midwest, and Canadian regions. The generation of electricity from renewable energy sources is a reasonable alternative for a review of power-generating facilities. Authorizations related to how individual regions of the United States will meet demands for electricity are not part of the application before the Commission, and their consideration is outside the scope of this EIS. Therefore, because the purpose of the Rover Project is to transport natural gas, and generation of electricity from renewable energy sources or the gains realized from increased energy efficiency and conservation are not transportation alternatives, they cannot function as a substitute for the Rover Project and are not considered or evaluated further in this analysis.

3.2 SYSTEM ALTERNATIVES

3.2.1 Transportation System Alternatives

System alternatives would make use of other existing, modified, or proposed pipeline systems (or other transportation systems) to meet the stated objectives of the Projects. A system alternative would make it unnecessary to construct all or part of the proposed Projects, 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 to meet the Projects' purpose and need. Such modifications or additions would result in environmental impacts that could be less than, similar to, or greater than those associated with construction of the proposed Projects. The purpose of identifying and evaluating system alternatives is to determine whether potential environmental impacts associated with construction and operation of the proposed facilities could be avoided or reduced by utilizing another system but while still meeting the basic objectives of the Projects.

To be a practicable system alternative to the proposed Projects, other systems or modified systems would need to meet the applicants' stated objectives (see sections 1.1 and 3.0) and be both technically feasible and practicable. Two of the applicants' objectives that are crucial to evaluation of system alternatives would be their ability to:

- deliver up to 3.25 Bcf/d of natural gas supply from the Marcellus and Utica Shale regions in West Virginia, Ohio, and Pennsylvania through interconnections with existing pipeline infrastructure in Ohio and Michigan to supply interstate natural gas pipelines and storage facilities as well as markets in the Gulf Coast, Midwest, and Canadian regions; and
- retrieve and transfer natural gas supplies from multiple producers' processing plants.

Another important consideration is whether a system alternative is economically practical. The shippers would deliver gas from existing sources in Pennsylvania, West Virginia, and Ohio to the various interconnections that supply natural gas to markets throughout the country. To be economically practicable, a system alternative must be capable of meeting shippers' requirements.

Figure 3.2.1-1 provides a geographic overview of the Projects' area(s), as well as the relative location of other existing interstate natural gas pipelines in the area that were evaluated as system alternatives. The status of existing systems is described below in section 3.2.2.

Another potential system alternative could involve the transportation of the required volume of liquefied natural gas (LNG) to the delivery point by truck via existing roadways. This alternative would require the construction of new liquefaction facilities near the supply areas and new vaporization plants at the delivery points. Additionally, in order to transport the proposed 3.25 Bcf/d of natural gas supply, more than 1,000 tank truck trips per day would be needed. Given the requirement for the new facilities that would have to be constructed as well as the number of truck trips that would be required on a continuous basis, we conclude that the use of LNG trucks to deliver the required amounts of natural gas is not preferable to the proposed Rover Project.

3.2.2 Pipeline System Alternatives

As discussed in section 1.3, since Rover's entering into the Commission's pre-filing process, and in response to comments received about its Project, Rover has incorporated one substantial system alternative into the Rover Project. Rover had initially planned to construct the Market Segment from the Defiance Compressor Station in Defiance, Ohio, to the Union Gas Dawn Hub in Ontario, Canada. Rover and Vector reached an agreement during the FERC's pre-filing process to shorten the Rover Project and provide an interconnection near Market Segment MP 100.0. With Vector's Mainline Expansion Project in place, incorporation of this system alternative eliminated 110 miles of pipeline from the original proposal and provides the required capacity to move contracted product to the Union Gas Dawn Hub.

Rover's parent company, Energy Transfer (or its affiliates), own and operate several existing pipeline systems, including the Panhandle and Trunkline Systems. None of these existing pipeline systems are capable of meeting the Rover Project's purpose and need because these systems do not have enough available capacity and/or do not proceed and connect to the appropriate locations. However, in addition to the aforementioned systems, four other existing pipeline systems are operating in the vicinity of the Rover Project:

- Utica East Ohio Midstream (UEO Midstream);
- Columbia Gas Transmission (CGT);
- Rockies Express Pipeline, LLC (REX); and
- TransCanada ANR East Pipeline Project (ANR East).

Figure 3.2.1-1
Rover Pipeline Project
System Alternatives Map

Rover obtained data for each pipeline system and determined, as described below, that UEO Midstream and ANR East are not viable system alternatives, and the CGT and REX pipelines do not provide the capacity or service to the same receipt/delivery markets as Rover. We have independently reviewed this information and conclude that these pipelines do not have the available capacity to transport the required volumes of natural gas to the delivery points at the Defiance Compressor Station or the interconnection with Vector in Michigan in their current configuration.

The UEO Midstream is in a similar geographic area, but has a different orientation than portions of the Clarington Lateral and the Supply Connector Lines A and B. More importantly; however, this pipeline system does not move processed transmission quality gas supplies; instead, it moves unprocessed gas to facilities to process the natural gas liquid components. For these reasons, we determined that it was not a viable system alternative.

The CGT system (a Columbia Pipeline Group and NiSource Company) originates near the Gulf of Mexico in Louisiana and terminates in central Ohio, with several east-west laterals. Some capacity does exist within this system, but it cannot accommodate an additional 3.25 Bcf/d and therefore does not meet the purpose and need of the Rover Project.

REX's existing pipeline moves natural gas from producers in the Rocky Mountains to the supplies in the Midwest (terminating in Clarington, Ohio). The existing pipeline has a maximum capacity of 1.8 Bcf/d, which does not meet the Rover Project purpose and need.

Rover made attempts to combine aspects of several of its Supply Laterals as well as Mainlines A and B with TransCanada's proposed ANR East Project. The ANR East Project would be similar to the Rover Project in that receipt points would be located in Clarington and Cadiz, Ohio, and delivery points would be in Defiance, Ohio. As discussed in section 4.13.4, TransCanada has not filed an application with the FERC. Based on discussions between Rover and TransCanada, Rover stated that the ANR East Pipeline Project would not provide the capacity required by its suppliers. Since ANR East has not filed an application nor has it released information on potential subscribers, we conclude that the ANR East Project is not a feasible alternative to the Rover Project.

In summary, none of the existing pipeline systems discussed in this section are equipped to transport the contracted volume, 3.25 Bcf/d, nor are they connected to the Rover Project's gas supply area in the Marcellus and Utica Shale regions of West Virginia, Pennsylvania, and Ohio. No existing pipeline system with the capacity to transport the contracted load connects the Marcellus and Utica Shale regions to serve the Project markets. Therefore, we do not consider use of existing pipeline systems as feasible alternatives for the proposed Projects.

3.2.3 Modification of Existing Pipeline Systems

Because none of the existing pipeline systems in the Projects' area have the capacity to meet the Projects' objectives in their current state, they would require substantial modifications to meet the Projects' objectives. These modifications could include greenfield pipeline construction to connect to the supply area, delivery area, or both; the use of existing pipeline(s) where possible along with looped pipeline (i.e., new pipeline construction generally adjacent to an existing pipeline); additional compression; or some combination of these options.

We dismissed major system alternatives from further consideration if their environmental impacts were considered to be greater than those of the proposed Projects. These scenarios at a minimum involved routes that would need to be partially looped with an existing pipeline and would require new greenfield segments that exceeded the length of the proposed Rover pipeline (510.7 miles). This eliminated system alternatives involving greenfield and looping options of the ANR East and REX Clarington West from further analysis. While some existing infrastructure could be expanded in order to meet the objectives of Rover's Project, environmental impacts would either remain the same or increase during the expansion process.

Alternatively, the CGT system which is currently under expansion as part of the Leach Xpress Project,[1] would have greenfield lengths associated with about 30 miles of looped pipeline that would be less than Rover's proposed pipeline. If approved, the Leach XPress Project will increase the capacity of CGT's system by 1.5 Bcf/d and will move regional gas supplies to various markets, including interconnections with NiSource's Columbia Gulf Transmission Pipeline in Leach, Kentucky. The Leach XPress Project would parallel and abut Rover's proposed Seneca Lateral in Monroe County, Ohio. Even with the upgrades to the CGT system, it would not meet the capacity of the currently proposed Rover Project nor would it service the same markets.

3.3 COLLOCATION WITH EXISTING PIPELINE SYSTEMS

We reviewed the potential to maximize collocation of the Rover pipeline almost completely along existing pipeline systems either alone or in tandem with other existing systems, or a combination of existing and proposed pipeline systems. In addition, we evaluated the potential for partial collocation with an existing pipeline system. One existing pipeline system was evaluated that met this criteria: the Panhandle System.

Panhandle Collocation Alternative

In order to increase the percentage of the Market Segment that would parallel existing rights-of way, we evaluated an alternative route that would parallel three of Panhandle's pipelines from the Defiance Compressor Station to the Panhandle's Edgerton valve site in Lenawee County, Michigan before turning northwest to parallel two of Panhandle's pipelines for 31 miles, continuing north for 28 miles to Brighton, Michigan then continuing 9 miles to the Vector pipeline (see figure 3.3-1). This Panhandle Collocation Alternative would follow Panhandle's existing system for 92.0 miles, or 82.8 percent of the route, as compared to Rover's proposed route, which is more greenfield (22.9 miles, or 22.7 percent collocated) (see table 3.3-1). We also received numerous comment letters suggesting that the Rover Project should follow Panhandle's existing right-of-way. Both routes would require a crossing of a recreation area (Brighton Recreation Area by the alternative route and Pinckney Recreation Area by the proposed route). These recreation areas offer similar recreational opportunities, such as camping, hiking, fishing, cross-country skiing, and would be subject to similar crossing lengths (about 1.5 miles). The alternative route would impact fewer forest lands (3.7 and 30.5 fewer acres of forested wetland and upland forest, respectively) and would result in five fewer crossings of perennial streams. However, the Panhandle Collocation Alternative is 11.1 miles longer than the proposed route, potentially impacting 136.6 more acres during construction. Furthermore, the Panhandle Route Alternative could result in the expansion of the existing right-of-way to up to 200 feet wide in some locations, further impacting additional landowners already encumbered by three pipeline easements. Taking everything into consideration, we conclude that the Panhandle Route Alternative does not offer a significant environmental advantage over the proposed route, and are not recommending it.

[1] Leach Xpress Project is listed on the FERC website as Docket No. CP15-514.

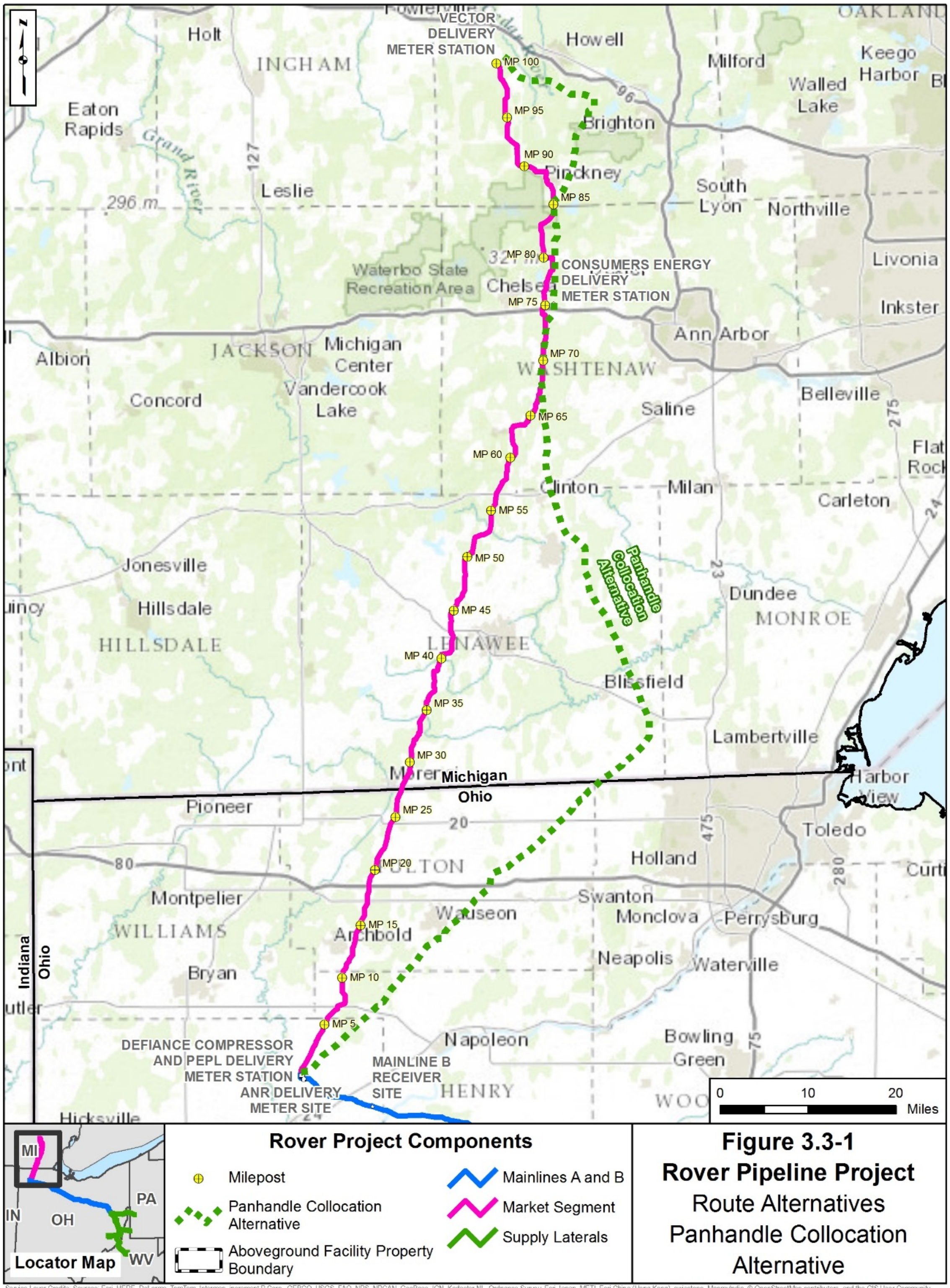


Figure 3.3-1
Rover Pipeline Project
Route Alternatives
Panhandle Collocation Alternative

TABLE 3.3-1

Comparison of the Proposed Route to the Panhandle Collocation Alternative

Environmental Factor	Unit	Proposed Route	Panhandle Collocation Alternative	Difference
Total length	miles	100.0	111.1	-11.1
Length adjacent to existing rights-of-way	miles	22.9	92.0	69.1 **a**
Percent adjacent to existing rights-of-way	percent	22.7	82.8	60.1 **a**
Total construction right-of-way	acres	1,196.5	1,339.9	-143.4
NWI emergent wetlands (75 feet wide)	acres	24.9	30.6	-5.8
NWI scrub-shrub wetlands (75 feet wide)	acres	13.2	18.9	-5.7
NWI forested wetlands (75 feet wide)	acres	22.0	18.3	3.7
Forest (75 feet wide)	acres	168.5	138.0	30.5
Agricultural land (100 feet wide)	acres	913.0	1,056.0	-143.1
Open land (75 feet wide)	acres	54.9	78.1	-23.2
Permanent right-of-way (50 feet wide)	acres	606.3	671.6	-65.3
NHD intermittent streams crossed	number	22	47	-25
NHD perennial streams crossed	number	27	23	4
NRHP-listed properties within 500 feet	number	0	0	0
Roads crossed	number	83	152	-69
Railroads crossed	number	14	8	6
Residences within 50 feet of the centerline	number	0	1	-1
NSAs (e.g., schools, hospitals) within 500 feet	number	0	0	0
Public lands crossed	miles	1.4 **b**	1.5 **c**	-0.1

NHD – National Hydrography Dataset
NRHP – National Register of Historic Places
NSA – Noise Sensitive Area
NWI – National Wetlands Inventory
Note: Comparisons are based on publicly available GIS data.
a i.e., the proposed route reflects a greater amount of greenfield (non-collocated) construction.
b Pinckney Recreation Area
c Brighton State Recreation Area

3.4 ROUTE ALTERNATIVES AND ROUTE VARIATIONS

Major route alternatives include those that deviate from the proposed route for considerable distance, often a majority or more of the proposed route's length, and that follow a substantially different pathway from the source area to the delivery area. Minor route alternatives deviate from the proposed route less substantially than major route alternatives, are often designed to avoid large environmental resources or engineering constraints, and typically remain within the same general area as the proposed route. Minor route variations are typically site-specific and may allow for avoidance of certain localized features such as a residence, wetland, or orchard.

This assessment includes route alternatives and variations identified by Rover, the FERC staff, landowners, municipalities, and other stakeholders. Many of the alternatives identified below are the result of Rover adopting changes to reduce impacts on specific resources; therefore, some of the alternatives presented are routes that were originally identified by Rover as part of its planned route during pre-filing that have since been replaced by a new proposed route. Our assessment of the environmental consequences of the variations already incorporated by Rover into its proposed route is included as part of our environmental analysis of the proposed Projects in section 4.0.

Discussions of alternatives for the tie-in/interconnection sites for the Supply Laterals are encapsulated in the discussion for the corresponding Supply Lateral.

3.4.1 Major Route Alternatives

We evaluated major route alternatives for the Supply Laterals, Mainlines A and B, and the Market Segment. These alternatives, along with a comparison of potential environmental impacts and other relevant factors, are described below.

3.4.1.1 Supply Lateral Alternatives

Sherwood West Alternative

The Sherwood West Alternative was identified by Rover during the FERC's pre-filing process and its early route development. The Sherwood Lateral (proposed route) and the Sherwood West Alternative both originate at the Sherwood Compressor Station and generally follow the same path in a northwesterly direction for about 25 miles (see figure 3.4.1-1). Just south of the Wayne National Forest Proclamation Boundary in Monroe County, Ohio, the alternative route takes a more westerly route to a terminus at the Seneca Compressor Station. Overall, the alternative route is about 2.1 miles shorter than the proposed route and would result in 32.5 fewer acres impacted during construction (see table 3.4.1-1). However, the Sherwood West Alternative crosses about 1.3 miles of the Wayne National Forest Proclamation Boundary. The proposed route culminates at the Sherwood Tie-in, about 16.5 miles east of the Seneca Compressor Station and thus would avoid crossing the Wayne National Forest Proclamation Boundary. Because the proposed route would avoid impacts on the Wayne National Forest Proclamation Boundary and the alternative route was not identified as offering any significant environmental advantages over the proposed route, we did not consider this alternative further.

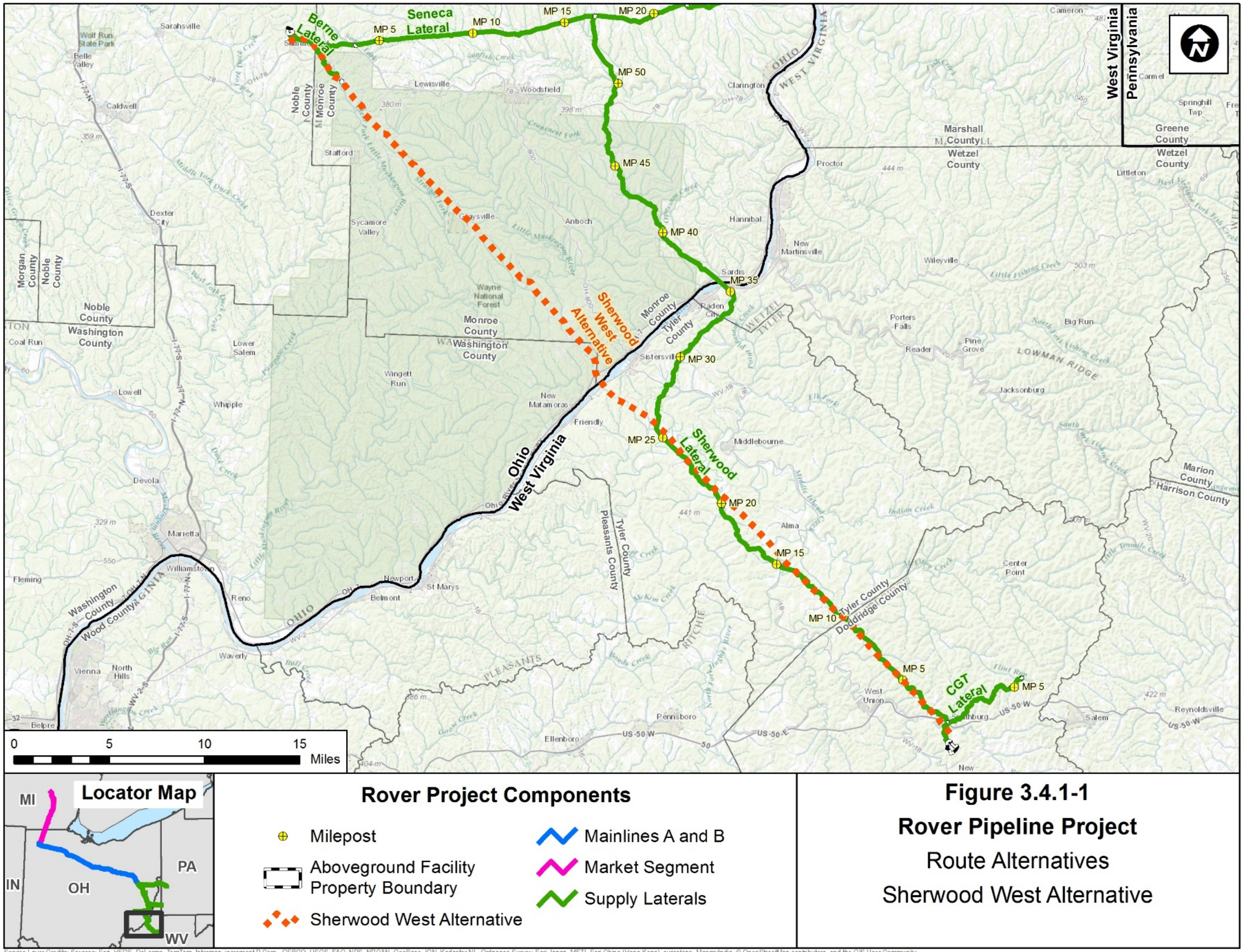


Figure 3.4.1-1
Rover Pipeline Project
Route Alternatives
Sherwood West Alternative

TABLE 3.4.1-1 **Comparison of the Proposed Route to the Sherwood West Alternative**				
Environmental Factor	**Unit**	**Proposed Route**	**Sherwood West Alternative**	**Difference**
Total length	miles	54	51.9	2.1
Length adjacent to existing rights-of-way	miles	0.9	4.3	3.4 **a**
Percent adjacent to existing rights-of-way	percent	1.6	8.3	6.7 **a**
Total construction right-of-way	acres	897.9	865.5	32.4
NWI emergent wetlands (100 feet wide)	acres	0	0	0.0
NWI scrub-shrub wetlands (100 feet wide)	acres	0	1.3	-1.3
NWI forested wetlands (75 feet wide)	acres	0	0.1	-0.1
Forest (125 feet wide)	acres	715.1	694.1	21.0
Agricultural land (150 feet wide)	acres	134	125.3	8.7
Open land (125 feet wide)	acres	48.8	46	2.8
Permanent right-of-way (50 feet wide)	acres	328.6	314.5	14.1
NHD intermittent streams crossed	number	40	61	-21
NHD perennial streams crossed	number	19	10	9
NRHP-listed properties within 500 feet	number	0	0	0
Roads crossed	number	114	95	19
Railroads crossed	number	1	1	0
Residences within 50 feet of the centerline	number	2	0	2
NSAs (e.g., schools, hospitals) within 500 feet	number	0	0	0
Public lands crossed	miles	0	1.3	-1.3

NHD – National Hydrography Dataset
NRHP – National Register of Historic Places
NSA – Noise Sensitive Area
NWI – National Wetlands Inventory
Note: Comparisons are based on publicly available GIS data.
a i.e., the proposed route reflects a greater amount of greenfield (non-collocated) construction.

Berne Lateral Alternative

The Berne Lateral Alternative was originally identified by Rover during the FERC's pre-filing process and Rover's early route development. The alternative route largely follows the proposed route, with offsets occurring in three locations. For purposes of our comparative analysis, the Berne Lateral Alternative was divided into three sections (see figure 3.4.1-2, map 1). This allowed us to evaluate the potential for incorporating one or more sections of the alternative into the proposed route.

A comparison of the environmental and other routing considerations associated with the Berne Proposed Route compared to the Berne Lateral Alternative Sections 1, 2, and 3 are presented in tables 3.4.1-2, 3.4.1-3, and 3.4.1-4 and are depicted in figure 3.4.1-2, maps 2–4.

For each case, the three sections of the Berne Lateral Alternative would be similar to the corresponding section of the proposed pipeline route in length and would result in similar impacts on waterbodies, wetlands, and nearby residences. However, each segment of the Berne Lateral Alternative route follows an existing right-of-way and would affect a total of 2.3 fewer acres of forested land. In the draft EIS, we recommended that Rover adopt the Berne Lateral Alternative Sections 1, 2, and 3. In March 2016, Rover filed additional information regarding the feasibility of adopting these three alternatives. Due to the presence of overhead transmission lines and an active mine, Rover has stated that it would be unable to adopt these alternatives. Based on our desktop review of the alternatives, as well as information provided by Rover, we have revised our conclusions regarding their adoption. Therefore, based on the information contained in the record, we have determined that incorporation of the Berne Lateral Alternative Sections 1, 2, and 3 are not technically feasible and we no longer recommend that Rover adopt them.

TABLE 3.4.1-2

Comparison of the Proposed Route and the Berne Lateral Alternative Section 1

Environmental Factor	Unit	Proposed Route	Berne Alternative 1	Difference
Total length	miles	0.8	0.8	0.0
Length adjacent to existing rights-of-way	miles	0.6	0.8	0.2 **a**
Percent adjacent to existing rights-of-way	percent	74.0	100.0	26.0 **a**
Total construction right-of-way	acres	7.5	7.1	0.4
NWI emergent wetlands (75 feet wide)	acres	0.0	0.0	0.0
NWI scrub-shrub wetlands (75 feet wide)	acres	0.0	0.0	0.0
NWI forested wetlands (75 feet wide)	acres	0.0	0.0	0.0
Forest (75 feet wide)	acres	7.3	6.8	0.5
Agricultural land (100 feet wide)	acres	0.2	0.3	-0.1
Open land (75 feet wide)	acres	0.0	0.0	0.0
Permanent right-of-way (50 feet wide)	acres	5.0	4.7	0.3
NHD intermittent streams crossed	number	1	1	0
NHD perennial streams crossed	number	0	0	0
NRHP-listed properties within 500 feet	number	0	0	0
Roads crossed	number	1	1	0
Railroads crossed	number	0	0	0
Tracts crossed	number	7	8	-1
Residences within 50 feet of the centerline	number	0	0	0
NSAs (e.g., schools, hospitals) within 500 feet	number	0	0	0
Public lands crossed	miles	0.0	0.0	0.0

NHD – National Hydrography Dataset
NRHP – National Register of Historic Places
NSA – Noise Sensitive Area
NWI – National Wetlands Inventory
Note: Comparisons are based on publicly available GIS data.
a i.e., the proposed route reflects a greater amount of greenfield (non-collocated) construction.

TABLE 3.4.1-3

Comparison of the Proposed Route and the Berne Lateral Alternative Section 2

Environmental Factor	Unit	Proposed Route	Berne Alternative 2	Difference
Total length	miles	0.5	0.5	0.0
Length adjacent to existing rights-of-way	miles	0.4	0.5	0.1 **a**
Percent adjacent to existing rights-of-way	percent	87.1	100.0	12.9 **a**
Total construction right-of-way	acres	4.6	4.3	0.3
NWI emergent wetlands (75 feet wide)	acres	0.0	0.0	0.0
NWI scrub-shrub wetlands (75 feet wide)	acres	0.0	0.0	0.0
NWI forested wetlands (75 feet wide)	acres	0.0	0.0	0.0
Forest (75 feet wide)	acres	4.6	4.3	0.3
Agricultural land (100 feet wide)	acres	0.0	0.0	0.0
Open land (75 feet wide)	acres	0.0	0.0	0.0
Permanent right-of-way (50 feet wide)	acres	3.1	2.9	0.2
NHD intermittent streams crossed	number	0	0	0
NHD perennial streams crossed	number	0	0	0
NRHP-listed properties within 500 feet	number	0	0	0
Roads crossed	number	0	0	0
Railroads crossed	number	0	0	0
Tracts crossed	number	3	3	0
Residences within 50 feet of the centerline	number	0	0	0
NSAs (e.g., schools, hospitals) within 500 feet	number	0	0	0
Public lands crossed	miles	0.0	0.0	0.0

NHD – National Hydrography Dataset
NRHP – National Register of Historic Places
NSA – Noise Sensitive Area
NWI – National Wetlands Inventory
Note: Comparisons are based on publicly available GIS data.
a i.e., the proposed route reflects a greater amount of greenfield (non-collocated) construction.

TABLE 3.4.1-4

Comparison of the Proposed Route and the Berne Lateral Alternative Section 3

Environmental Factor	Unit	Proposed Route	Berne Alternative 3	Difference
Total length	miles	0.6	0.6	0.0
Length adjacent to existing rights-of-way	miles	0.4	0.6	0.2 **a**
Percent adjacent to existing rights-of-way	percent	68.3	100.0	31.7 **a**
Total construction right-of-way	acres	6.4	7.0	-0.6
NWI emergent wetlands (75 feet wide)	acres	0.0	0.0	0.0
NWI scrub-shrub wetlands (75 feet wide)	acres	0.0	0.0	0.0
NWI forested wetlands (75 feet wide)	acres	0.0	0.0	0.0
Forest (75 feet wide)	acres	3.0	1.4	1.5
Agricultural land (100 feet wide)	acres	3.2	5.4	-2.2
Open land (75 feet wide)	acres	0.2	0.2	0.1
Permanent right-of-way (50 feet wide)	acres	3.7	3.8	0.0
NHD intermittent streams crossed	number	1	1	0
NHD perennial streams crossed	number	0	0	0
NRHP-listed properties within 500 feet	number	0	0	0
Roads crossed	number	00	0	0
Railroads crossed	number	0	0	0
Tracts crossed	number	3	3	0
Residences within 50 feet of the centerline	number	0	0	0
NSAs (e.g., schools, hospitals) within 500 feet	number	1	1	0
Public lands crossed	miles	0.0	0.0	0.0

NHD – National Hydrography Dataset
NRHP – National Register of Historic Places
NSA – Noise Sensitive Area
NWI – National Wetlands Inventory
Note: Comparisons are based on publicly available GIS data.
a i.e., the proposed route reflects a greater amount of greenfield (non-collocated) construction.

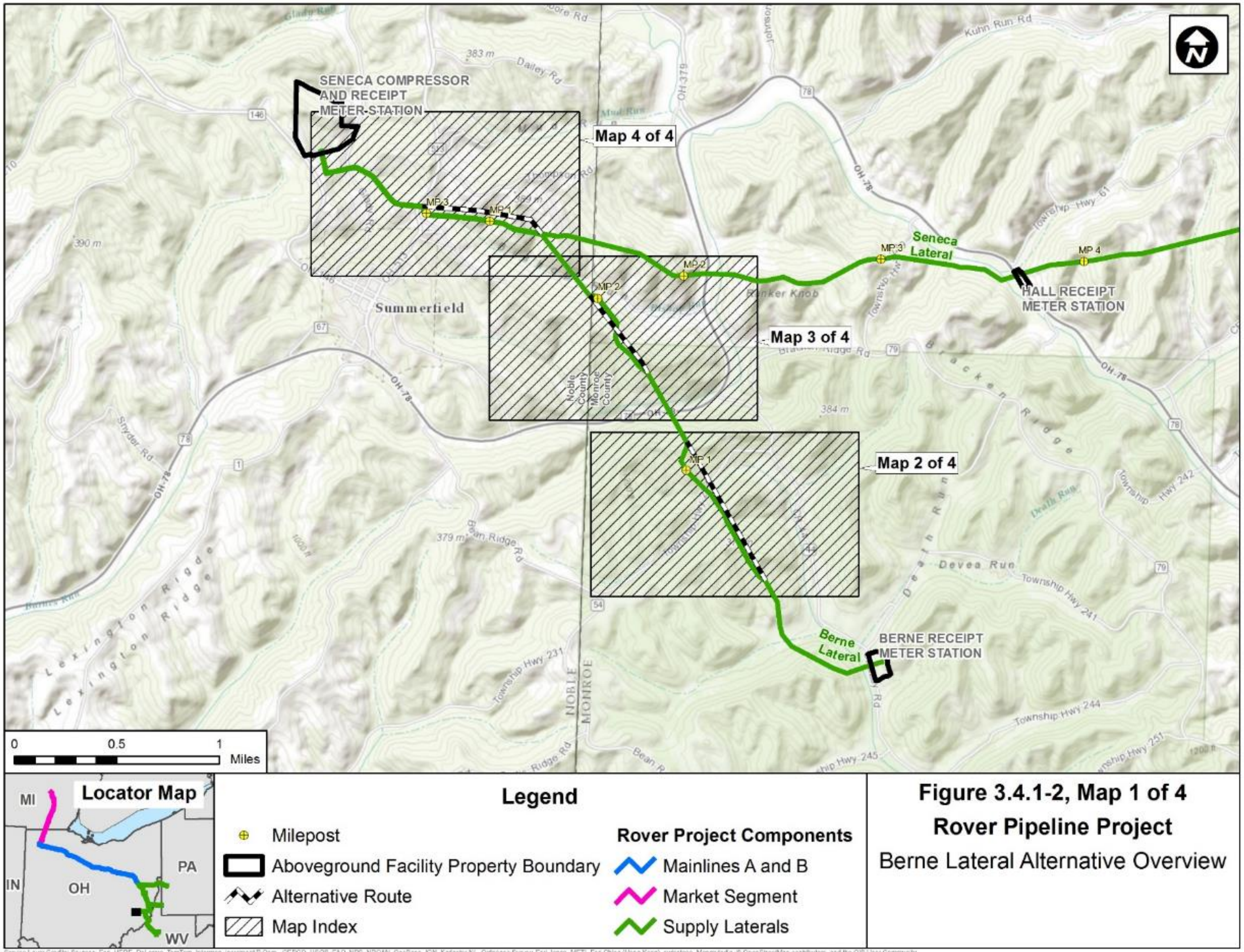


Figure 3.4.1-2, Map 1 of 4
Rover Pipeline Project
Berne Lateral Alternative Overview

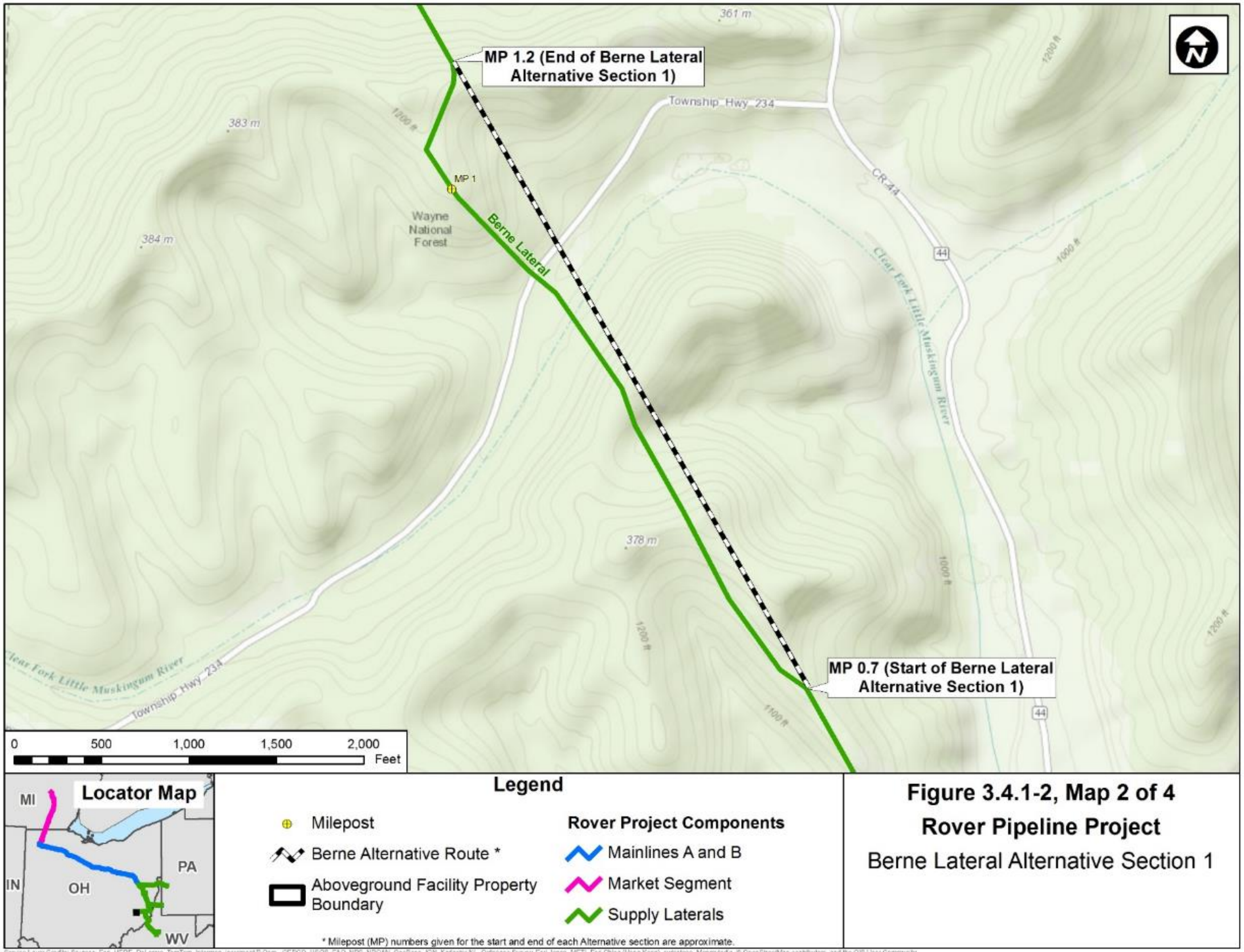
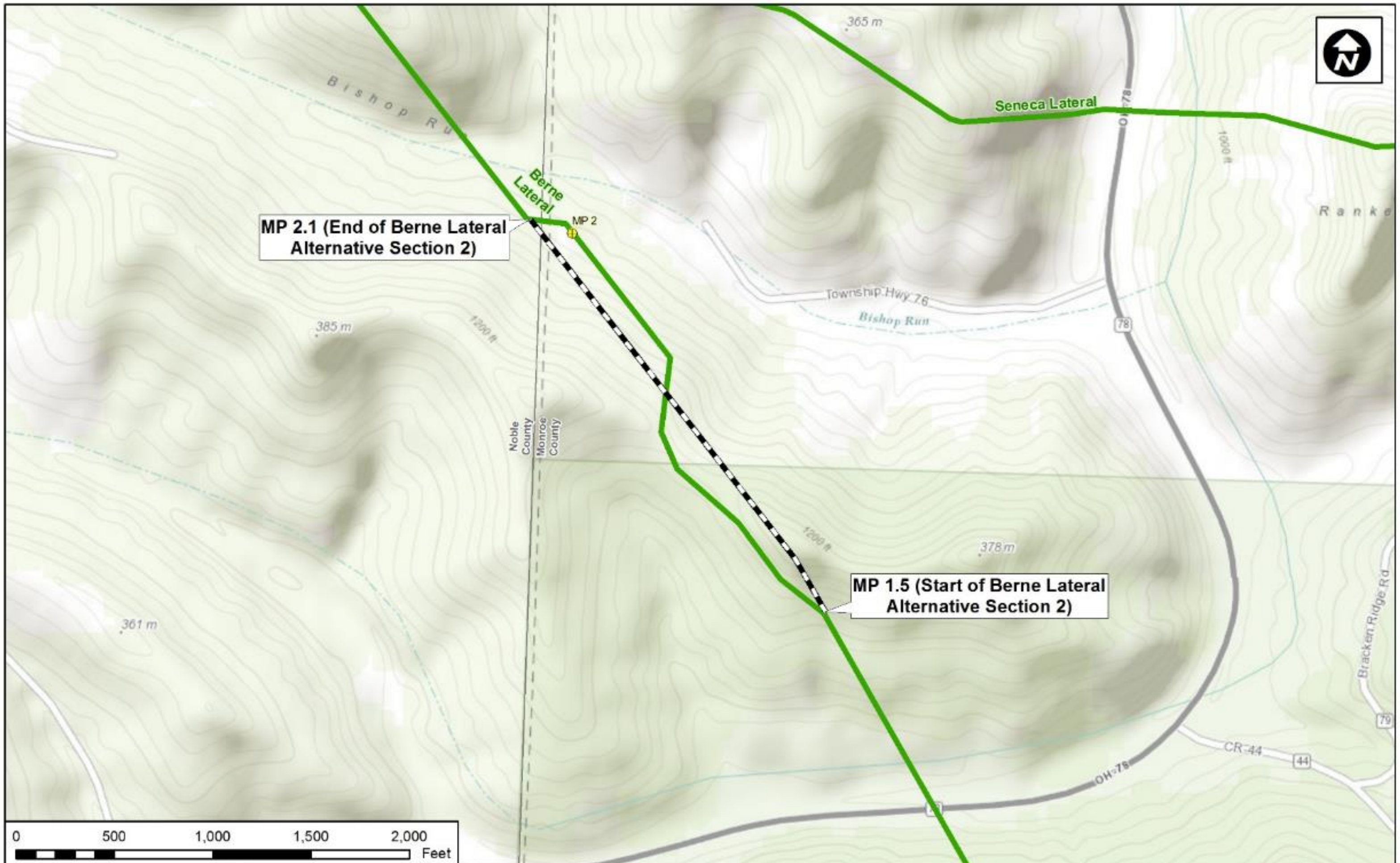


Figure 3.4.1-2, Map 2 of 4
Rover Pipeline Project
Berne Lateral Alternative Section 1



Legend

- Milepost
- Berne Alternative Route *
- Aboveground Facility Property Boundary

Rover Project Components

- Mainlines A and B
- Market Segment
- Supply Laterals

* Milepost (MP) numbers given for the start and end of each Alternative section are approximate.

Figure 3.4.1-2, Map 3 of 4

Rover Pipeline Project

Berne Lateral Alternative Section 2

Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

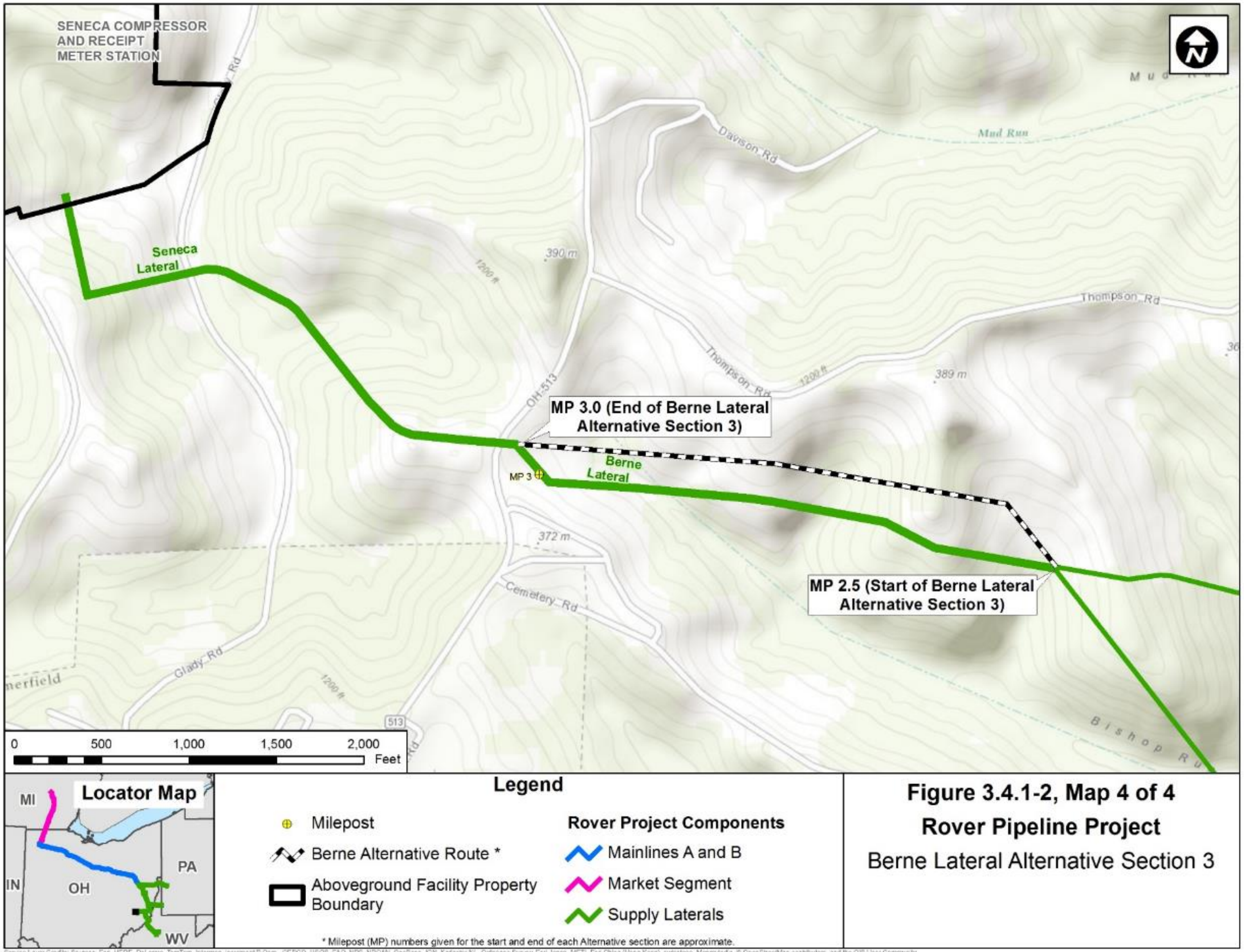


Figure 3.4.1-2, Map 4 of 4
Rover Pipeline Project
Berne Lateral Alternative Section 3

3.4.1.2 Mainlines A and B – NEXUS Alternative

The NEXUS Alternative involves collocation with the proposed NEXUS project. NEXUS filed its application with the FERC on November 20, 2015, in Docket No. CP16-22-000. The proposed NEXUS project is a 250-mile natural gas pipeline from Kensington, Ohio, to Southeastern Michigan that would deliver 1.5 Bcf/d. The NEXUS Alternative would result in a single right-of-way that would contain both projects, instead of two separate rights-of-way located about 30 miles apart. A comparison of the environmental considerations associated with proposed route compared to the NEXUS Alternative is presented in table 3.4.1-5. The NEXUS Alternative begins at about MP MAB 52.4, where the route would turn north away from the proposed route along 26 miles of a new greenfield path before intersecting with the NEXUS route. The alternative then follows the NEXUS route for about 97 miles before it diverges and continues to the southeast for 47 miles along a new greenfield route, and then rejoins the proposed Mainlines A and B route near MP MAB 203.6 (see figure 3.4.1-3).

TABLE 3.4.1-5

Comparison of the Proposed Route to the NEXUS Alternative

Environmental Factor	Unit	Mainlines A and B, MPs 52.4 to 203.6		Difference
		Proposed Route	NEXUS Alternative	
Total length	miles	151.2	170.4	-19.2
Length adjacent to existing rights-of-way	miles	123.7	90.4	-33.4**a**
Percent adjacent to existing rights-of-way	percent	79.7	53.0	-26.7**a**
Total construction right-of-way	acres	2,735.4	3,038.5	-303.1
NWI emergent wetlands (120 feet wide)	acres	9.7	2.4	7.3
NWI scrub-shrub wetlands (120 feet wide)	acres	6.5	8.5	-2.1
NWI forested wetlands (75 feet wide)	acres	5.3	10.5	-5.2
Forest (135 feet wide)	acres	187.8	319.6	-131.7
Agricultural land (150 feet wide)	acres	2,429.4	2,511.1	-81.7
Open land (135 feet wide)	acres	118.1	207.8	-89.7
Permanent right-of-way (60 feet wide)	acres	1,112.6	1,239.4	-126.8
NHD intermittent streams crossed	number	134	77	57
NHD perennial streams crossed	number	41	48	-7
NRHP-listed properties within 500 feet	number	0	0	0
Roads crossed	number	161	174	-13
Railroads crossed	number	17	28	-11
Residences within 50 feet of the centerline	number	3	1	2
NSAs (e.g., schools, hospitals) within 500 feet	number	0	0	0
Public lands crossed	miles	0.0	0.0	0.0

NHD – National Hydrography Dataset
NRHP – National Register of Historic Places
NSA – Noise Sensitive Area
NWI – National Wetlands Inventory
Note: Comparisons are based on publicly available GIS data.
a i.e., the alternative route reflects a greater amount of greenfield (non-collocated) construction

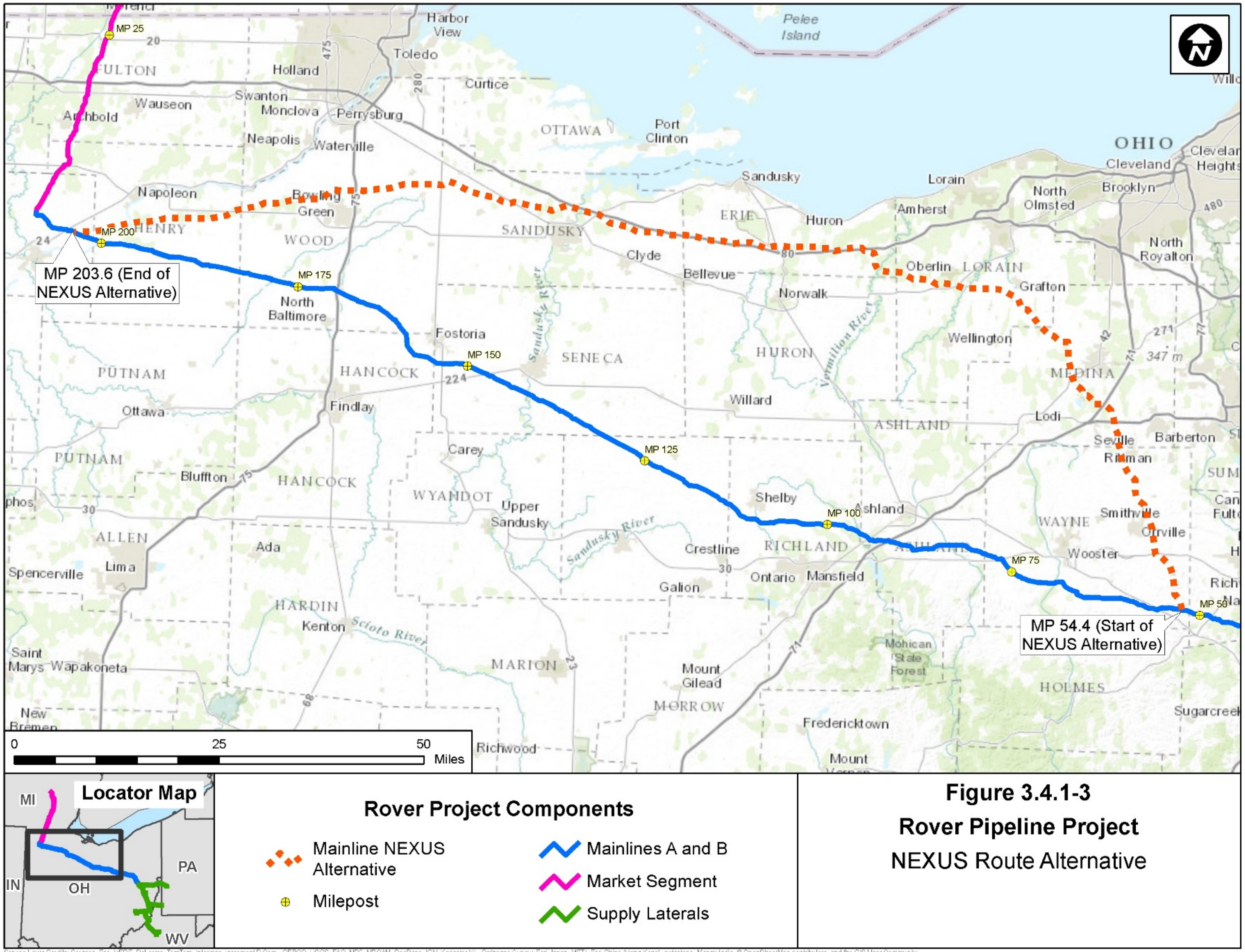


Figure 3.4.1-3
Rover Pipeline Project
NEXUS Route Alternative

The Nexus Alternative is 19.2 miles longer than the corresponding segment of the proposed route and would affect 303.1 more acres of land during construction. The additional acreage would include 131.7 more acres of forested uplands as well as an increase in the impacts on forested wetlands. Given that the NEXUS Alternative does not offer a greater environmental advantage over the proposed route, we conclude that adoption of this alternative is not preferable to the proposed route.

3.4.1.3 Market Segment Alternative

Since filing its application, Rover adopted the so-called Market Segment Routes 1 through 4 as the proposed route. Thus, the Market Alternative evaluated below is the formerly proposed route that Rover presented in its application. Because we have received several landowner comments regarding the impacts of the Market Segment, we are evaluating below whether to recommend that Rover be required to re-adopt its originally considered route.

For purposes of our comparative analysis, the Market Segment Alternative was divided into four sections, (see figure 3.4.1-4, map 1). This allows us to evaluate incorporating potentially one or more sections of the alternative into the proposed route. The Market Segment Alternative route generally follows the proposed route, meandering from one side to the other of the proposed route but generally staying within 750 feet of the proposed route, except at the four sections discussed below, where the offset increases to between 1,600 and 4,800 feet.

A comparison of the environmental and other routing considerations associated with the proposed Market Segment compared to Market Segment Alternative Sections 1–4 are presented in tables 3.4.1-6 – 3.4.1-9 and depicted in figure 3.4.1-4, maps 2–5.

The Market Segment Alternative Section 1 is 0.9 mile longer and would affect 3.1 more acres than the proposed pipeline route from MPs MS 68.0 to MS 81.8 in Washtenaw County, Michigan (see table 3.4.1-6). Section 1 of the alternative would impact 4.8 more acres of forested wetlands than the corresponding portion of the proposed route, but it would impact 2.6 fewer acres of emergent wetlands and would result in one less perennial stream crossing. The Market Segment Alternative Section 1 would parallel existing pipeline easements for about 19.8 percent of its route, while the proposed Market Segment route would parallel existing easements for 73.5 percent. Based on the proposed route having been developed in response to landowner requests and concerns, and a large portion of the route being collocated, we do not consider adoption of the alternative route to be preferable to the proposed Project route.

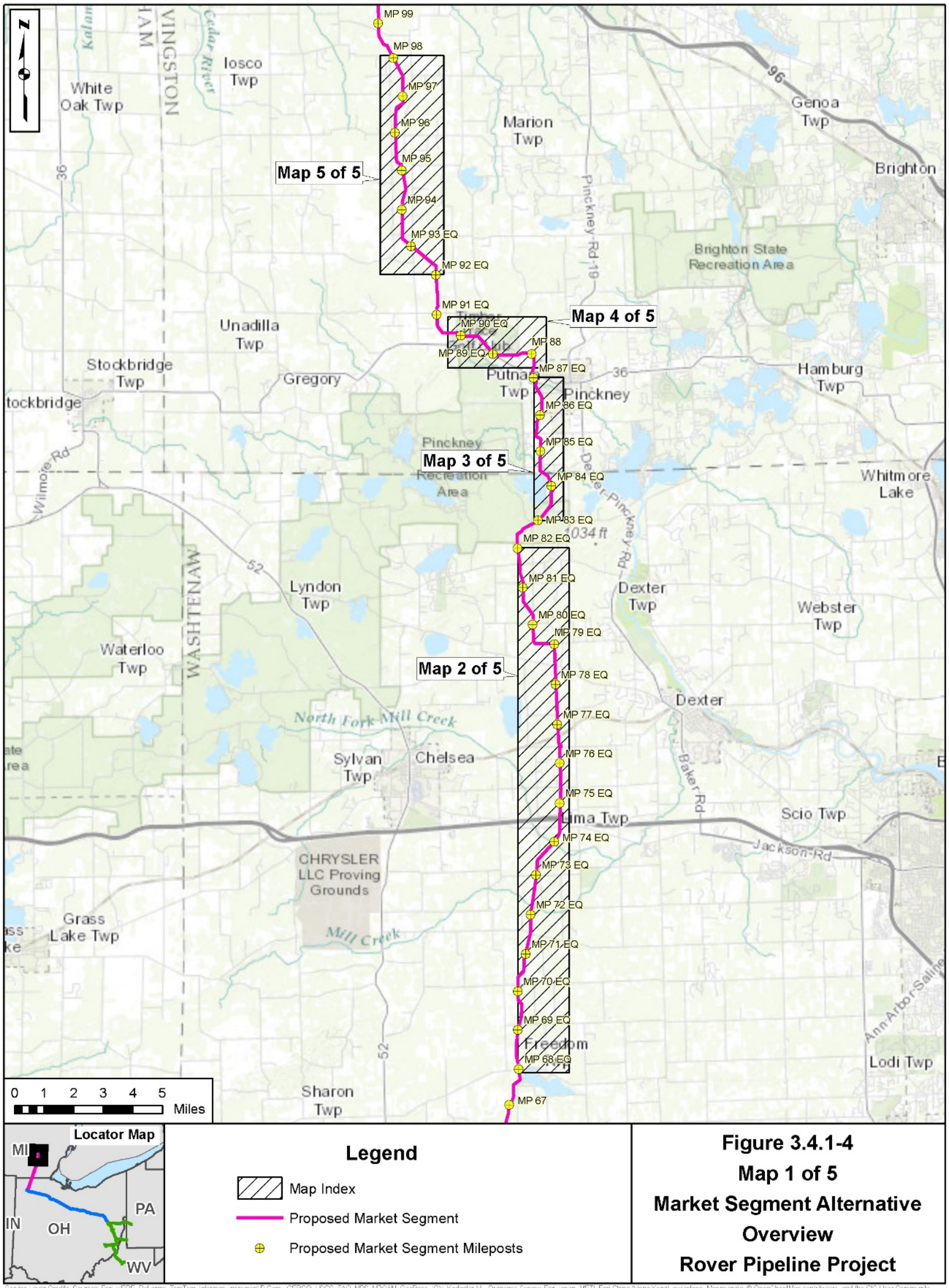


Figure 3.4.1-4
Map 1 of 5
Market Segment Alternative Overview
Rover Pipeline Project

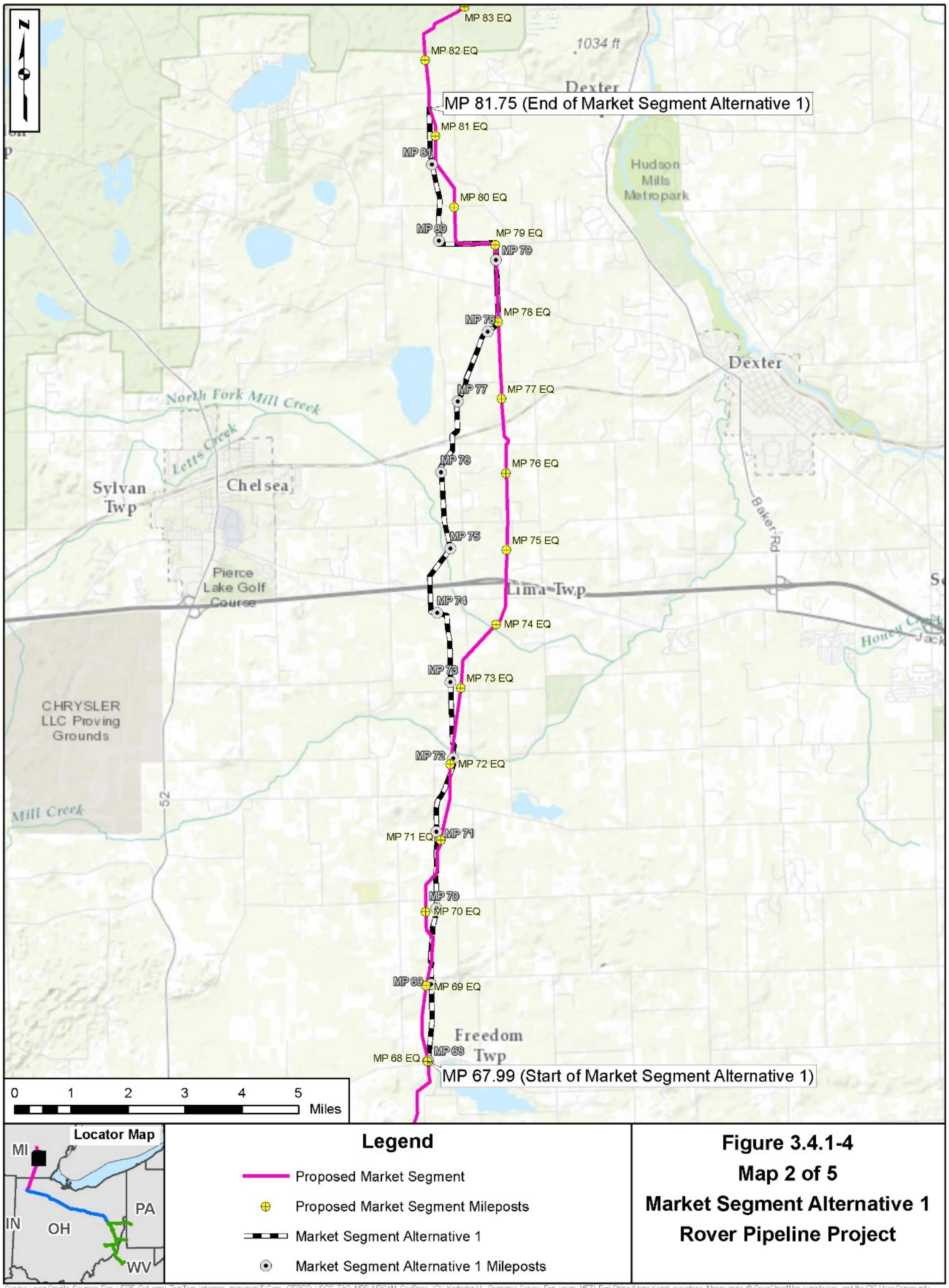


Figure 3.4.1-4
Map 2 of 5
Market Segment Alternative 1
Rover Pipeline Project

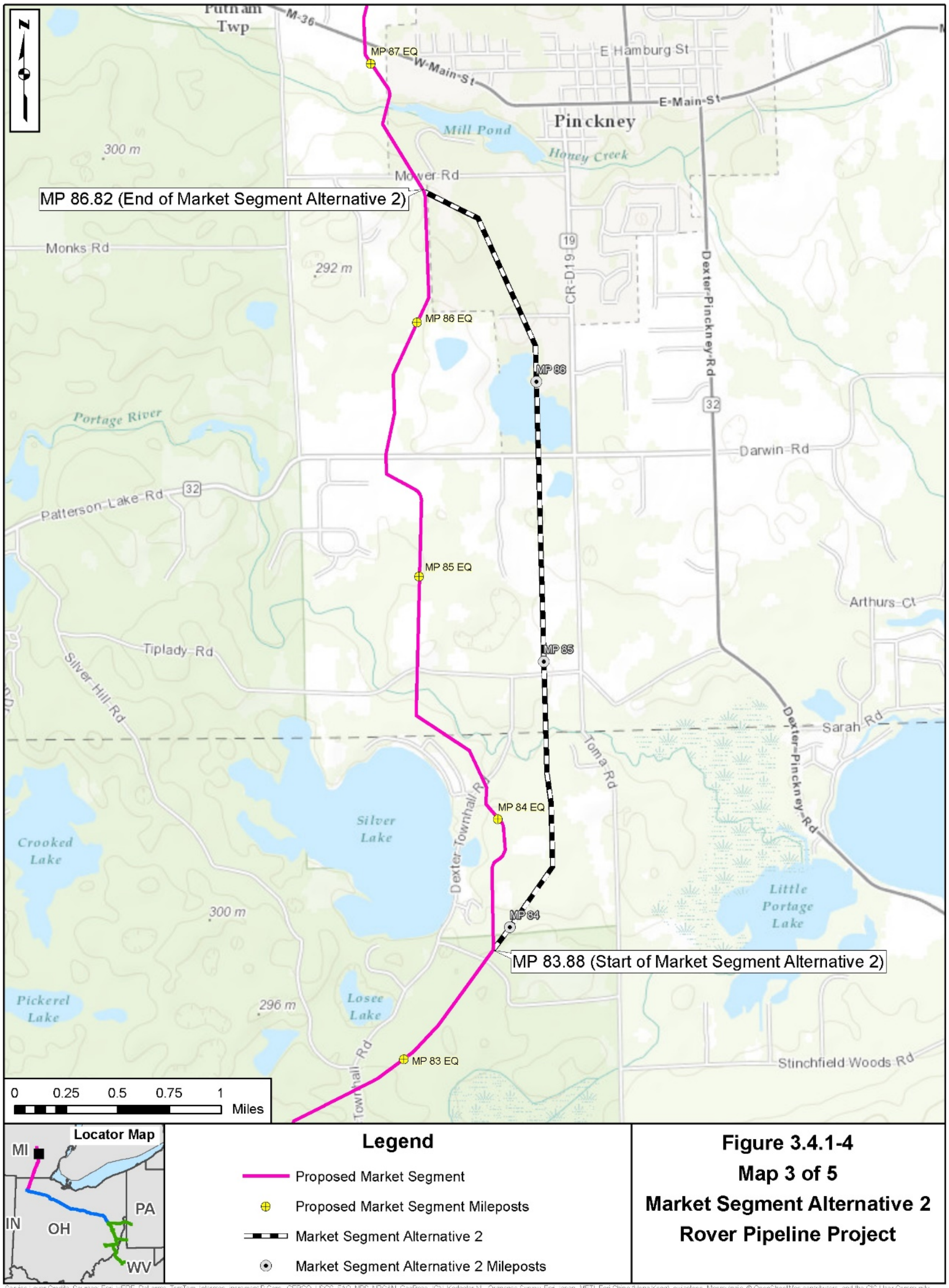


Figure 3.4.1-4
Map 3 of 5
Market Segment Alternative 2
Rover Pipeline Project

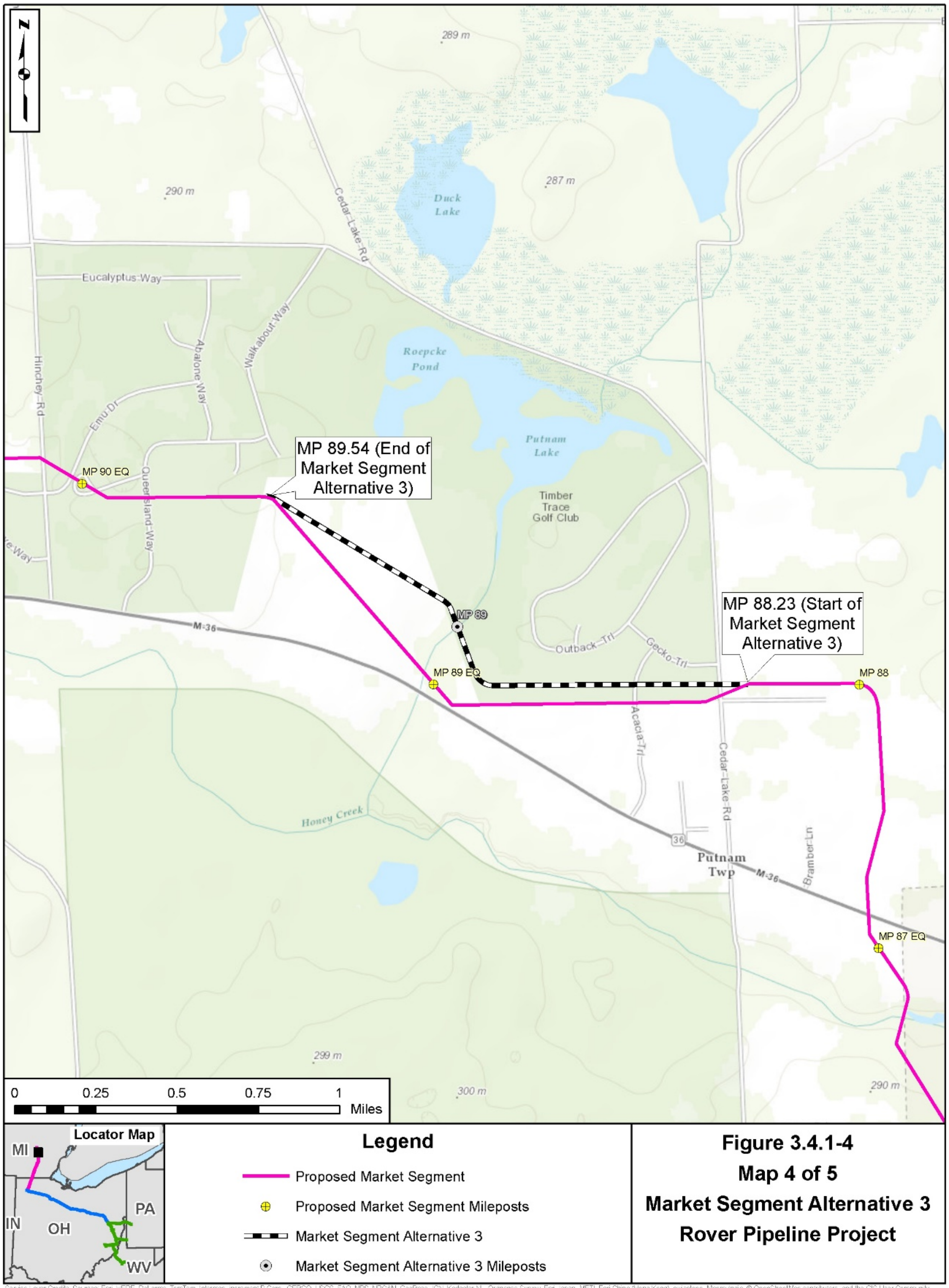


Figure 3.4.1-4
Map 4 of 5
Market Segment Alternative 3
Rover Pipeline Project

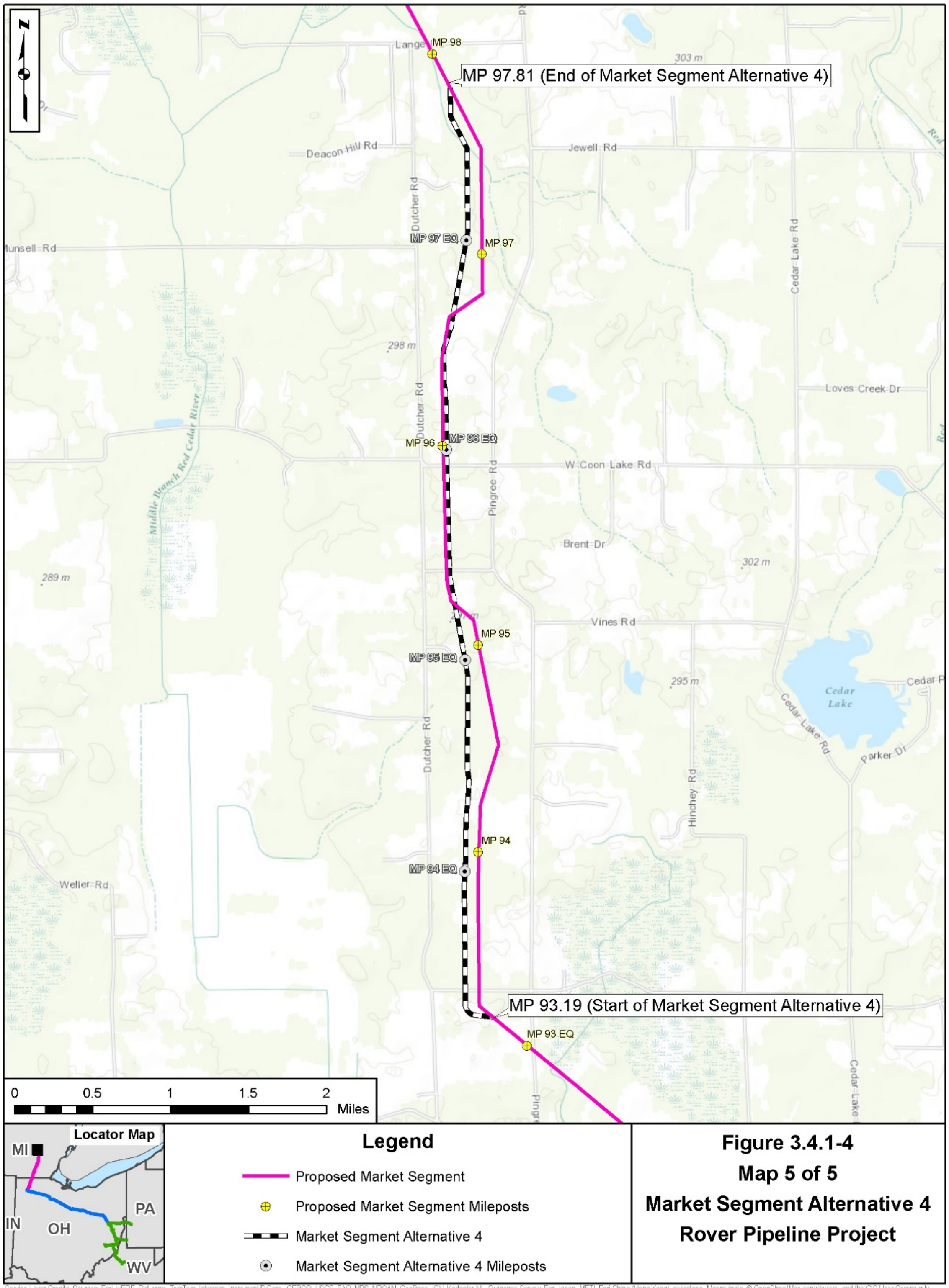


Figure 3.4.1-4
Map 5 of 5
Market Segment Alternative 4
Rover Pipeline Project

TABLE 3.4.1-6

Comparison of the Proposed Route to Market Segment Alternative Section 1

Environmental Factor	Unit	Market Segment, MPs 68.0 to 81.8 — Proposed Route	Market Segment, MPs 68.0 to 81.8 — Alternative Route	Difference
Total length	miles	11.6	12.5	-0.9
Length adjacent to existing rights-of-way	miles	8.5	2.5	-6.0 **a**
Percent adjacent to existing rights-of-way	percent	73.5	19.8	-54.0 **a**
Total construction right-of-way	acres	196.2	209.2	-13.0
NWI emergent wetlands (120 feet wide)	acres	15.8	12.5	3.3
NWI scrub-shrub wetlands (120 feet wide)	acres	6.5	1.6	5.0
NWI forested wetlands (75 feet wide)	acres	2.4	6.2	-3.8
Forest (135 feet wide)	acres	34.8	42.6	-7.9
Agricultural land (150 feet wide)	acres	152.8	159.3	-6.5
Open land (135 feet wide)	acres	8.6	7.2	1.4
Permanent right-of-way (60 feet wide)	acres	72.4	74.6	-2.2
NHD intermittent streams crossed	number	4	6	-2
NHD perennial streams crossed	number	8	7	1
NRHP-listed properties within 500 feet	number	0	0	0
Roads crossed	number	13	14	-1
Railroads crossed	number	1	1	0
Tracts crossed	number	63	56	7
Residences within 50 feet of the centerline	number	7	1	6
NSAs (e.g., schools, hospitals) within 500 feet	number	0	0	0
Public lands crossed	miles	0	0	0

NHD – National Hydrography Dataset
NRHP – National Register of Historic Places
NSA – Noise Sensitive Area
NWI – National Wetlands Inventory
Note: Comparisons are based on publicly available GIS data.
a i.e., the alternative route reflects a greater amount of greenfield (non-collocated) construction.

TABLE 3.4.1-7

Comparison of the Proposed Route to Market Segment Alternative Section 2

Environmental Factor	Unit	Market Segment, MPs 83.9 to 86.8		Difference
		Proposed Route	Alternative Route	
Total length	miles	3.0	2.9	<0.1
Length adjacent to existing rights-of-way	miles	0.4	2.1	1.7 **a**
Percent adjacent to existing rights-of-way	percent	13.5	71.4	58.0 **a**
Total construction right-of-way	acres	43.0	36.2	6.8
NWI emergent wetlands (120 feet wide)	acres	0.5	3.3	-2.8
NWI scrub-shrub wetlands (120 feet wide)	acres	1.6	0.4	1.3
NWI forested wetlands (75 feet wide)	acres	1.3	1.6	-0.3
Forest (135 feet wide)	acres	27.5	15.4	12.1
Agricultural land (150 feet wide)	acres	12.5	15.3	-2.8
Open land (135 feet wide)	acres	3.0	5.5	-2.5
Permanent right-of-way (60 feet wide)	acres	18.0	17.9	0.1
NHD intermittent streams crossed	number	0	0	0
NHD perennial streams crossed	number	1	1	0
NRHP-listed properties within 500 feet	number	0	0	0
Roads crossed	number	3	3	0
Railroads crossed	number	0	0	0
Tracts crossed	number	26	27	-1
Residences within 50 feet of the centerline	number	2	0	2
NSAs (e.g., schools, hospitals) within 500 feet	number	0	0	0
Public lands crossed	miles	0	0	0

NHD – National Hydrography Dataset
NRHP – National Register of Historic Places
NSA – Noise Sensitive Area
NWI – National Wetlands Inventory
Note: Comparisons are based on publicly available GIS data.
a i.e., the proposed route reflects a greater amount of greenfield (non-collocated) construction.

TABLE 3.4.1-8

Comparison of the Proposed Route to the Market Segment Alternative Section 3

Environmental Factor	Unit	Market Segment, MPs 88.2 to 89.5		Difference
		Proposed Route	Alternative Route	
Total length	miles	1.3	1.3	0
Length adjacent to existing rights-of-way	miles	0	0	0
Percent adjacent to existing rights-of-way	percent	0.0	0.0	0.0
Total construction right-of-way	acres	21.5	21.6	-0.2
NWI emergent wetlands (120 feet wide)	acres	0.4	0.0	0.4
NWI scrub-shrub wetlands (120 feet wide)	acres	0.0	0.5	-0.5
NWI forested wetlands (75 feet wide)	acres	0.1	0.0	0.1
Forest (135 feet wide)	acres	2.0	1.2	0.7
Agricultural land (150 feet wide)	acres	14.5	13.0	1.5
Open land (135 feet wide)	acres	5.0	7.3	-2.3
Permanent right-of-way (60 feet wide)	acres	8.0	7.8	0.2
NHD intermittent streams crossed	number	0	0	0
NHD perennial streams crossed	number	0	0	0
NRHP-listed properties within 500 feet	number	0	0	0
Roads crossed	number	0	0	0
Railroads crossed	number	0	0	0
Tracts crossed	number	0	0	0
Residences within 50 feet of the centerline	number	0	1	-1
NSAs (e.g., schools, hospitals) within 500 feet	number	0	0	0
Public lands crossed	miles	0.0	0.0	0.0

NHD – National Hydrography Dataset
NRHP – National Register of Historic Places
NSA – Noise Sensitive Area
NWI – National Wetlands Inventory
Note: Comparisons are based on publicly available GIS data.

TABLE 3.4.1-9

Comparison of the Proposed Route to the Market Segment Alternative Section 4

Environmental Factor	Unit	Market Segment, MPs 93.2 to 97.8 Proposed Route	Alternative Route	Difference
Total length	miles	4.6	4.5	1.0
Length adjacent to existing rights-of-way	miles	4.6	4.3	-0.3 **a**
Percent adjacent to existing rights-of-way	percent	100.0	95.6	-4.4 **a**
Total construction right-of-way	acres	68.45	66.2	2.3
NWI emergent wetlands (120 feet wide)	acres	4.3	3.8	0.4
NWI scrub-shrub wetlands (120 feet wide)	acres	2.0	5.1	-3.2
NWI forested wetlands (75 feet wide)	acres	4.3	4.2	0.1
Forest (135 feet wide)	acres	18.9	25.8	-6.9
Agricultural land (150 feet wide)	acres	47.6	38.3	9.4
Open land (135 feet wide)	acres	1.9	2.2	-0.2
Permanent right-of-way (60 feet wide)	acres	28.1	27.5	0.6
NHD intermittent streams crossed	number	0	0	0
NHD perennial streams crossed	number	0	0	0
NRHP-listed properties within 500 feet	number	0	0	0
Roads crossed	number	3	3	0
Railroads crossed	number	0	0	0
Tracts crossed	number	40	15	25
Residences within 50 feet of the centerline	number	0	0	0
NSAs (e.g., schools, hospitals) within 500 feet	number	0	0	0
Public lands crossed	miles	0	0	0

NHD – National Hydrography Dataset
NRHP – National Register of Historic Places
NSA – Noise Sensitive Area
NWI – National Wetlands Inventory
Note: Comparisons are based on publicly available GIS data.
a i.e., the alternative route reflects a greater amount of greenfield (non-collocated) construction.

The Market Segment Alternative Section 2 diverges from the proposed route at MP MS 83.9 in Washtenaw County, Michigan, for approximately 2.9 miles before rejoining the proposed route at MP MS 86.8 in Livingston County, Michigan. This alternative would parallel and collocate for most of its length with an electrical transmission line operated by the International Transmission Company (ITC). The Market Segment Alternative Section 2 would affect 6.8 fewer acres than the proposed pipeline route, including 1.3 acres of scrub-shrub wetland (see table 3.4.1-7), and would result in no residences within 50 feet of the centerline. However, Alternative Section 2 would impact 2.8 and 0.3 more acres of emergent and forested wetlands, respectively. The Market Segment Alternative Section 2 would parallel an existing easement (transmission line) for 71.4 percent of route, compared to 13.5 percent for the proposed route. The alternative section would also result in less forest clearing than the corresponding segment of the proposed route (12 less acres of tree clearing). In response to our recommendation in the draft EIS that Rover file an update on its negotiations with ITC, Rover stated that it is continuing to work with ITC and is confident an agreement can be reached. We conclude that collocation with the existing transmission line along this 3-mile-long segment would offer a significant environmental advantage; therefore, **we recommend that:**

- **Rover should adopt the 3-mile-long Market Segment Alternative Section 2 to collocate the proposed pipeline with the ITC corridor.**

The Market Segment Alternative Section 3 would diverge from the proposed route at MP MS 88.2 in Livingston County, Michigan, for approximately 1.3 miles before rejoining the proposed route at MP MS 89.5. Section 3 alternative would be about the same length as the proposed route; however, it would affect 0.2 more acre of land, including 0.5 acre of scrub-shrub wetlands and 0.4 acre of emergent wetlands (see table 3.4.1-8). Neither the proposed Market Segment route nor the Market Segment Alternative 3 section parallels any existing rights-of-way. However, the proposed route was developed in response to landowner requests and concerns and would affect fewer landowners. Therefore, we do not consider adoption of the alternative route to be preferable to the proposed Project route.

The Market Segment Alternative Section 4 diverges from the proposed route at MP MS 93.2 in Livingston County, Michigan, for approximately 4.5 miles before rejoining the proposed route at MP MS 97.8. Section 4 Alternative would be 1.0 mile shorter and would impact 2.3 fewer acres than the proposed route (see table 3.4.1-9). The Market Segment Alternative Section 4 route would parallel existing pipeline easements for 95.6 percent of its route, as compared to 100 percent for the proposed route. However, the proposed route was developed in response to landowner requests and concerns and would affect fewer landowners. Therefore, we do not consider adoption of the alternative route to be preferable to the proposed Project route.

3.4.2 Minor Route Alternatives

Although they can extend for several miles, minor route alternatives deviate from the proposed route less substantially than major route alternatives. Minor route alternatives are often designed to avoid large environmental resources or engineering constraints, and typically remain within the same general area as the proposed route.

We analyzed five minor route alternatives that were identified by Rover in its application. Four were associated with the Market Segment and are described above in section 3.4.1.3. We analyzed the last one of these below: the Sherwood Route Alternative 1. This alternative is discussed below.

Sherwood Route Alternative 1

The Sherwood Route Alternative 1 was the original route identified by Rover for crossing the Ohio River. The alternative route diverges from the proposed route at MP SWL 32.9, where it runs northwest-north of Paden City, then turns west to cross the Ohio River and Paden Island (home to Paden Island National Wildlife Refuge managed by the FWS) using the HDD crossing method, then rejoins the proposed route at MP SWL 36.9 (see figure 3.4.2-1). While the proposed route is 0.6 mile longer and would affect 9.8 more acres than Sherwood Route Alternative 1 (see table 3.4.2-1), there does not appear to be a substantial advantage for the alternative route on any given resource. Therefore, we do not find the Sherwood Route Alternative 1 to be preferable to the proposed route, and it is not further evaluated. However, given the impacts of the current route on several residences, we are proposing an alternate crossing location in table 3.4.3-3 and appendix I2.

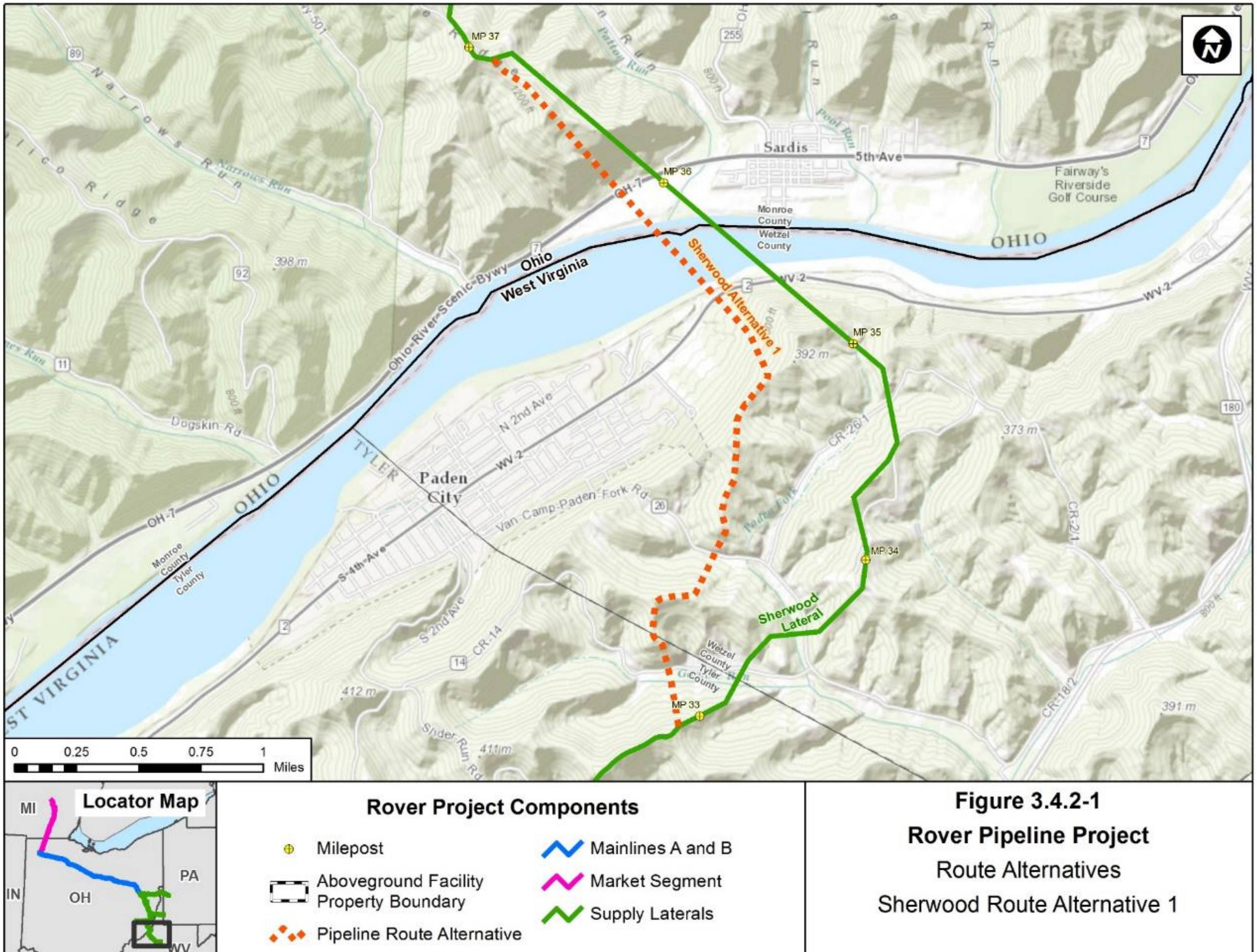


Figure 3.4.2-1
Rover Pipeline Project
Route Alternatives
Sherwood Route Alternative 1

TABLE 3.4.2-1 **Comparison of the Proposed Route to the Sherwood Route Alternative 1**				
		Sherwood Lateral MPs 32.9 – 36.9		
Environmental Factor	**Unit**	**Proposed Route**	**Sherwood Route Alternative 1**	**Difference**
Total length	miles	4.0	3.4	0.6
Length adjacent to existing rights-of-way	miles	0.0	0.0	0.0
Percent adjacent to existing rights-of-way	percent	0.0	0.0	0.0
Total construction right-of-way	acres	61.8	52.0	9.8
NWI emergent wetlands (120 feet wide)	acres	0.0	0.0	0.0
NWI scrub-shrub wetlands (120 feet wide)	acres	0.0	0.0	0.0
NWI forested wetlands (75 feet wide)	acres	0.0	0.2	-0.2
Forest (135 feet wide)	acres	41.0	38.3	2.6
Agricultural land (150 feet wide)	acres	10.9	4.4	6.5
Open land (135 feet wide)	acres	9.9	9.3	0.6
Permanent right-of-way (50 feet wide)	acres	24.1	20.5	3.7
NHD intermittent streams crossed	number	0	1	-1
NHD perennial streams crossed	number	3	1	2
NRHP-listed properties within 500 feet	number	0	0	0
Roads crossed	number	13	8	5
Railroads crossed	number	1	0	1
Tracts crossed	number	24	32	-8
Residences within 50 feet of the centerline	number	1	0	1
NSAs (e.g., schools, hospitals) within 500 feet	number	0	0	0
Public lands crossed	miles	0.0	0.0	0.0
NHD – National Hydrography Dataset NRHP – National Register of Historic Places NSA – Noise Sensitive Area NWI – National Wetlands Inventory Note: All calculations are based on publicly available GIS data.				

3.4.3 Route Variations

In addition to the major and minor route alternatives described above, we evaluated route variations that are much smaller in scale. Typically, they are shorter in length and involve minor shifts in the pipeline alignment to avoid a site-specific resource issue or concern. These site-specific issues included proximity to homes and property boundaries; avoidance of forested land, waterbodies, wetlands, side slopes, and special agricultural areas; and addressing impacts on other construction-related, environmental, or landowner concerns. While many of these minor variations were incorporated, a smaller number were reviewed and rejected by Rover for environmental or construction engineering reasons, or because some of them subsequently became isolated and obsolete because of incorporation of other alternatives. In June 2015, Rover adopted 59 variations into its proposed route for various reasons, including landowner requests, avoidance of sensitive resources, or engineering considerations. In March 2016, in response to our draft

EIS, comments filed to the record, and ongoing discussions with landowners, Rover filed an additional 62 minor route variations it had incorporated into its proposed route.

Prior to the issuance of the draft EIS, 49 comments were filed to the FERC docket by stakeholders requesting route variations to avoid specific resources (see appendix I). These do not include comments received on the portion of the Market Segment (about 110 miles in northern Michigan) that was eliminated based on Rover's capacity agreement with Vector (see discussion in section 3.2.2).

Appendix I details the parcel number, location, description of request, Rover's assessment, and our analysis of the variation and our conclusions. We generally concurred with Rover's assessment, and conclusions for these stakeholder-identified minor route variations. However, based on our evaluation of the landowner comments (as described in appendix I), we recommended in the draft EIS that Rover further evaluate 13 of the landowner requested variations. These tracts are listed below in table 3.4.3-1 along with Rover's responses to our recommendation in the draft EIS. Based on our analyses, we conclude that the issues for 11 of the parcels have been adequately. In these cases, minor route variations were either agreed to by Rover, are no longer applicable, or we could not identify a viable reroute or modified construction method that was preferable to the proposed route (see table 3.4.3-1). However, we did identify two parcels where a route variation was feasible and warranted; therefore, **we recommend that:**

- **Rover should adopt the two route variations at MPs BGL 48.9 and MAB 44.0 (as specified in table 3.4.3-1 and depicted in appendix I2 of the EIS) and file with the Secretary revised alignment sheets for the Burgettstown Lateral and Mainlines A and B that incorporate these variations into the Rover Project <u>prior to the start of construction</u>.**

TABLE 3.4.3-1

Revised Analysis of Variations Discussed in the Draft EIS

Land Parcel ID	MP	Description of Requested Minor Route Deviation	Rover's Response to the Recommendation in the Draft EIS	FERC Assessment and Conclusion or Recommendation
Traylor, Joel (OH-BE-ML-010.000 , 011.000, 011.340, 012.000)	MJL 12.7	Landowner raised concerns about impacts on the New Life Fellowship Church properties.	"Easement acquired."	Rover's response acceptable. Given that Rover has executed an easement with the landowner for this parcel, we conclude that any outstanding landowner concerns regarding pipeline routing have been adequately resolved.
Webb, Robert & Brandon (OH-CA-HL-001.000, OH-JE-HL-100.000)	BGL 35.8	Landowner raised concerns for the pipeline impacting plans for construction of a pond, and suggested moving the route to a field on the property that would avoid the pond location.	"Easement closed."	Rover's response acceptable. Given that Rover has executed an easement with the landowner for this parcel, we conclude that any outstanding landowner concerns regarding pipeline routing have been adequately resolved.

TABLE 3.4.3-1 (continued)

Revised Analysis of Variations Discussed in the Draft EIS

Land Parcel ID	MP	Description of Requested Minor Route Deviation	Rover's Response to the Recommendation in the Draft EIS	FERC Assessment and Conclusion or Recommendation
Adam, Larry & Marie (OH-CA-HL-065.000, OH-CA-HL-066.000)	BGL 48.9	Landowners raised concerns about the proximity of the pipeline to their home, approximately 200 feet, and damage to their hay field.	"The pipeline is approximately 400 feet from the house. Correspondence with landowner has been limited by attorney."	Proposed route not acceptable. Rover has not evaluated a variation on the property. Additionally, Rover's statement is incorrect as the residence on parcel OH-CA-HL-066.000 does appear to be about 250 feet from the centerline. Based on our analysis, moving the route as requested would not result not impact any additional landowners or result in a greater impact on environmental resources. Given that the landowner request does appear reasonable**, we recommend that Rover adopt the route variation depicted in appendix I, figure I2-1**, which would move the pipeline about 200 feet further to the south, closer to the edge of the agricultural field and further from the residence.
Various sites, Murray Energy Corporation	Various	Murray Corporation sought to discuss relocation of the proposed pipeline and compressor station to a location that would not be impacted by future mining operations.	"Rover and Murray Corporation are coordinating to establish a crossing agreement. As currently proposed, Rover would have a total of 6,123 feet of centerline on Murray Energy-owned properties in Belmont County, Ohio. Of that total footage, we are directly co-located and parallel with an existing 30" Dominion TPL15 Pipeline for approximately 3,344ft. There are no proposed Rover Pipeline, LLC compressor stations within close proximity, or encroaching any Murray Energy Properties."	Proposed route acceptable. Given that we did not receive comments on the draft EIS from Murray Energy Corporation or its affiliates, and that Rover and Murray Energy are continuing to coordinate, we conclude that the currently proposed route is acceptable.

TABLE 3.4.3-1 (continued)

Revised Analysis of Variations Discussed in the Draft EIS

Land Parcel ID	MP	Description of Requested Minor Route Deviation	Rover's Response to the Recommendation in the Draft EIS	FERC Assessment and Conclusion or Recommendation
Sherry Miller (OH-CA-016.000)	MAB 22.0	Landowner raised concerns for proximity of the route near their home and barn, as well as impacts on the burial site of their family dog and Dawn Redwood trees. Further concerns were raised regarding the presence of a former mine under the property, and a reroute to avoid this mine was requested.	"Rover has reduced temporary workspace and avoided the pet cemetery per the landowners' request. The proposed route crosses the smallest portion of the tract possible, for a distance of 96 feet. Rover cannot revise alignment in this area due to adjacent residence and proposed crossing of County Road 39."	Proposed route acceptable. Reduction of ATWS has minimized impacts on property to the extent possible; rerouting elsewhere would affect additional new landowners.
Lahr, Terrence (OH-ST-024.000)	MAB 44.0	Landowner requested reroute to avoid future building site and property access (driveway). The requested reroute includes crossing Blough Avenue further south, through a neighboring parcel before entering commentor's parcel along his southern property boundary.	"Rover reviewed the route proposed by the landowner. There is a steep ravine along the southern portion of his property that would prevent construction and operation of the pipeline. The landowner's ability to access the property will be maintained throughout construction."	Proposed route not acceptable. In order to prevent the pipeline route from entering the parcel at its current location, at least three additional landowners would be impacted. Therefore, the proposed route at the entrance of the parcel is the preferred route. However, based on our desktop review, we have determined that a variation along the southern portion of the property boundary is feasible. **Therefore, we recommend Rover adopt the variation depicted in appendix I2, figure I2-2**.
Sautter, Greg (OH-WA-052.510)	MAB 66.4	The landowner raised concerns for the proximity of the route to his house, septic system and drain line, a geothermal system, nearby power lines, and fencing.	No updated response received from the applicant. Rover adopted a route variation in June 2015 to avoid the features identified by the landowner, per an on-site meeting with the landowner.	Proposed route acceptable. One of the concerns raised by the landowners prior to the draft EIS was the proximity of the pipeline to the residence. In June 2015, Rover adjusted the route on the parcel to accommodate several landowner concerns; however, the route was moved closer to the home. Based on our analysis, moving the route further to the north of the originally proposed route would impact additional landowners. As we are unable to identify the specific locations of the landowner's other features of concern, we conclude that the currently proposed route is acceptable. See section 4.12 regarding safety of the pipeline.

TABLE 3.4.3-1 (continued)

Status of Minor Route Variations Reported by Stakeholders Prior to Issuance of the Draft EIS

Land Parcel ID	MP	Requested Minor Route Deviation Description	Rover's Response to the Recommendation in the Draft EIS	FERC Assessment and Conclusion or Recommendation
Wolfe, Kathy (OH-RI-001.000)	MAB 95.9	The landowner raised concerns about impacts from the Rover Project route on bald eagles nesting on their property and suggested relocating the route within their property to avoid the nests.	"Rover has concluded investigations regarding this nest and has received informal approval by the USFWS – Columbus Field Office. The riparian area is avoided by an HDD. The nest is approximately 1,100 feet from HDD entry point, 1,350 feet from HDD exit, and 875 feet laterally from the HDD path."	Proposed route acceptable. As discussed in section 4.6.1.5, impacts on bald eagle nests have been avoided and would therefore result in no significant impacts on the bald eagle. Therefore, we are not recommending an alternate route.
Belknap, John & Kelly (MI-WA-042.000)	MS 64.5	The landowners raised concerns for diagonal pipeline route through their property.	"Easement closed"	Proposed route acceptable. Given that Rover has executed an easement with the landowner for this parcel, we conclude that any outstanding landowner concerns regarding pipeline routing have been adequately resolved.
Schaible, Luther (MI-WA-059.000)	MS 68.0	Landowner raised concerns for the pipeline impacting a drain tile and identified an alternative route west of the originally proposed route.	Rover rerouted through this tract in June 2015 to parallel the existing Panhandle Eastern Pipeline easement. Rover and Land Stewards, Inc. will work with the landowner to identify and avoid any drain tile issues.	Proposed route acceptable. The proposed route follows an existing right-of-way. We did not identify an alternative pipeline routing that offered a significant environmental advantage over Rover's proposed route. Mitigation measures for impacts on drain tiles is discussed in section 4.8.4 of the EIS.
Poley, Irene (Estate of Dorothy Wenk) (MI-WA-066.510)	MS 71.0	Landowner suggested that the Rover Project route follow an existing pipeline on their property.	"Property MI-WA-066.510 is an adjacent property."	Proposed route acceptable, as the Rover Project would not cross this landowner's property.
Wenk, Paul (Estate of Dorothy Wenk) (MI-WA-070.000)	MS 71.0	Landowner suggested that the Rover Project route follow an existing pipeline on their property.	Rover stated an easement on property MI-WA-070.000 has been negotiated.	Proposed route acceptable. Given that Rover has executed an easement with the landowner for parcel MI-WA-070.00, we conclude that any outstanding landowner concerns regarding pipeline routing have been adequately resolved.
Hansen, Mary & Eric (Abutter Tract)	MS 75.0	Landowners suggested moving the pipeline route to be adjacent to the Panhandle Pipeline easement.	Rover has rerouted to follow the Panhandle Eastern easement as requested.	Proposed route acceptable. Based on Rover's adoption of alternative routing, we conclude landowner concerns have been resolved.

TABLE 3.4.3-1 (continued)

Status of Minor Route Variations Reported by Stakeholders Prior to Issuance of the Draft EIS

Land Parcel ID	MP	Requested Minor Route Deviation Description	Rover's Response to the Recommendation in the Draft EIS	FERC Assessment and Conclusion or Recommendation
Blough, David F. (MI-WA-094.314, MI-WA-093.510)	MS 75.5	Landowner raised concerns that the right-of-way width needed in addition to the parallel existing easement would further encroach on his property.	Rover has rerouted to cross to the other side of the existing pipeline at this location and has shifted the workspace away from the residence.	Proposed route acceptable. Based on Rover's adoption of alternative routing, we conclude landowner concerns have been resolved.
Munsell, Gordon (MI-LI-83.560)	MS 99.8	Landowner raised concerns that the pipeline would be constructed too close to the drainage ditch. He requested a reroute that would keep the pipeline away from the ditch.	Rover has rerouted off of this tract.	Proposed route acceptable. Based on Rover's adoption of alternative routing, we conclude landowner concerns have been resolved.

In the draft EIS, for each of 13 homes located within 10 feet of the workspace or crossed by the Rover Project, we recommended that Rover provide either documentation of landowner agreement with the site-specific residential construction plan, or identify a minor route variation around the homes. In response to this recommendation, Rover filed updated information on the each of the 13 homes. Rover provided documentation of easement agreements or an acceptable route variation for 10 of these parcels. Rover indicated that negotiations are ongoing for the remaining three residences, all of which are within the construction workspace or crossed by centerline and would presumably require removal. Additionally, due to reroutes along the Rover Project filed after the draft EIS, 15 additional residences are now crossed or within 10 feet of the Rover Project. Of these 15 residences, Rover has not yet reached an agreement for four parcels. Table 3.4.3-2 presents the analysis and our conclusions for the locations where potential variations were identified and Rover was unable to adjust the proposed route, or where adopted variations resulted in newly affected residences. Because Rover has either not provided landowner concurrence regarding the construction plans for these tracts, or been unable or unwilling to adopt variations around these residences **we recommend that:**

- **Rover should adopt the route variations and/or alternative construction techniques for MPs SHL 34.4, MJL 7.2, and BGL 37.1 (as specified in table 3.4.3-2 and depicted in the corresponding figure in appendix I2 of the EIS) and adopt workspace modifications for MPs SEL 10.0, MS 73.45, CLL 8.0, and SEL 22.7, or file with the Secretary written documentation that Rover and the landowner have reached an alternative agreement. Additionally, Rover should file with the Secretary revised alignment sheets for the Sherwood Lateral, Majorsville Lateral, Burgettstown Lateral, Seneca Lateral, Market Segment, and Clarington Lateral that incorporate these variations into the Rover Project <u>prior to the start of construction</u>.**

TABLE 3.4.3-2

Minor Route Variation Analysis of Residences within 10 feet of Construction Workspace

Project Segment	Parcel Number	MP	FERC-Requested Minor Route Variation	Rover's Analysis / Response	FERC Conclusion
Residences within 10 feet of construction workspace					
Seneca Lateral	**OH-MO-SCL-045.000**	**10.0**	**Move the construction workspace further from the residence (currently 0.4 feet from residence).**	**NA – This residence was previously more than 500 feet from the construction workspace. However, due to the addition of the Madison Meter Station in March 2016, this residence is now within 10 feet.**	**The apparent level of effort demonstrated by the applicant to minimize impacts on this landowner during construction appears to be insufficient. Given that alternatives exist to further minimize impacts during construction, we recommend that Rover reduce the width of the construction right-of-way in the vicinity of this residence or otherwise move it further from the residence. We did not receive any comments from the owner of this parcel.**
Market Segment	**MI-WA-082.520**	**73.45**	**Move the construction workspace further from the residence (currently 5.1 feet from residence).**	**NA – The residence was previously about 30 feet from the construction workspace. However, due to a reroute in March 2016, this residence is now within 10 feet.**	**The apparent level of effort demonstrated by the applicant to minimize impacts on this landowner during construction appears to be insufficient. Given that alternatives exist to further minimize impacts during construction, we recommend that Rover reduce the width of the construction right-of-way in the vicinity of this residence or otherwise move it further from the residence. We did not receive any comments from the owner of this parcel.**

TABLE 3.4.3-2 (continued)

Minor Route Variation Analysis of Residences within 10 feet of Construction Workspace

Project Segment	Parcel Number	MP	FERC-Requested Minor Route Variation	Rover's Analysis / Response	FERC Conclusion
Residences within the Construction Workspace					
Sherwood Lateral	OH-MO-SHC-003.000	34.4	As requested in the draft EIS, adjust the HDD crossing location and exit pit location as depicted in appendix I, figure I2-3.	This residence is within the path of the HDD crossing of the Ohio River. Several alternatives for this crossing have previously been submitted. Rover indicated it is continuing to coordinate with the landowner to reach an agreement to purchase the tract.	Proposed route not acceptable. If an agreement to purchase the property cannot be reached, we recommend that Rover adopt the identified route variation (see appendix I2, figure I2-3). We did not receive any comments from the owner of this parcel.
Majorsville Lateral	WV-MA-ML-038.000	7.2	This residence is crossed by the centerline. As requested in the draft EIS, adopt the route variation identified in appendix I2.	Rover is continuing to coordinate with the landowner to reach an agreement to purchase the tract.	Proposed route not acceptable. If an agreement to purchase the property cannot be reached, we recommend that Rover adopt the, identified route variation (see appendix I2, figure I2-4) or implement a trenchless crossing such as a horizontal directional drill. We did not receive any comments from the owner of this parcel.
Burgettstown Lateral	OH-CA-HL-011.100	37.1	As requested in the draft EIS, adopt the route variation identified in appendix I2.	The house is under construction. Rover has provided a route variation around the property. The variation is similar in length to the proposed route. Rover is continuing to coordinate with the landowner to reach an agreement to purchase the tract. However, Rover has stated that if the landowner would prefer the variation around the residence, Rover would evaluate the variation through surveys.	Proposed route not acceptable. If an agreement to purchase the property cannot be reached, we recommend that Rover adopt the identified route variation (see appendix I2, figure I2-5). We did not receive any comments from the owner of this parcel.

TABLE 3.4.3-2 (continued)

Minor Route Variation Analysis of Residences within 10 feet of Construction Workspace

Project Segment	Parcel Number	MP	FERC-Requested Minor Route Variation	Rover's Analysis / Response	FERC Conclusion
Clarington Lateral	**OH-BE-CC-043.000**	**8.0**	**Analysis for residence within the construction workspace that has not yet been purchased by Rover.**	**NA – Structure was not previously identified as a residence. Rover filed updates in March 2016 that now indicate the structure as a residence.**	**Proposed route not acceptable. We recommend that Rover reduce the Rover Project workspace to avoid the residence. We did not receive any comments from the owner of this parcel.**
Seneca Lateral	**OH-MO-SCL-118.000**	**22.7**	**Analysis for residence within the construction workspace that has not yet been purchased by Rover.**	**NA – This residence was previously more than 500 feet from the construction workspace. However, due to the addition of the Madison Meter Station March 2016, this residence is now within the construction workspace.**	**Proposed route not acceptable. We recommend that Rover reduce the Rover Project workspace to avoid the residence. We did not receive any comments from the owner of this parcel.**

ATWS – Additional temporary workspace

Note: **Bolded** rows represent those residences that, due to a variation adopted after the draft EIS are now within 10 feet of the workspace.

Twenty-nine stakeholders provided comments on the draft EIS about specific impacts on their properties, stated that prior issues at their parcels remained unresolved, or also requested that the FERC evaluate minor route variations that might avoid resources on their parcels. Rover provided several supplemental filings in March, April, and May 2016 that discussed the issues, routing, and alternatives referenced in the comments provided by the 29 landowners. In its response, Rover agreed to incorporate two of the suggested minor route variations into its proposed route (which we independently have determined sufficiently address the commentor's concerns). Rover further stated the remaining variation requests could not adopted for many of the same reasons discussed prior to the draft EIS, such as:

- engineering and constructability issues;
- increases in the number of affected landowners; or
- increases in environmental impacts.

We concurred with Rover's response to 19 of the remaining 27 variation requests; however, in one instance we recommend that Rover adopt additional mitigation measures and for seven instances we recommend that Rover adopt the variation requested by the stakeholder, because the variations offer environmental advantages and appear technically feasible. Table 3.4.3-3 presents the analysis and our conclusions for the locations where potential variations were identified. Because we have concluded that the eight variations or mitigation measures noted above would address the landowner's concern without increasing environmental impacts, and appear technically feasible, **we recommend that:**

- **Rover should adopt the minor route variations for MPs SWL 35.3, SEL 19.0, SEL 24.0, CLL 27.9, MJL 13.5, MAB 44.0, and MS 65.0 (as specified in table 3.4.3-3 and depicted in appendix I2 of the EIS) and adopt the additional mitigation measures for MP BGL 1.0 (see table 3.4.3-3). Rover should file with the Secretary updated alignment sheets incorporating these minor route variations <u>prior to the start of construction.</u>**

TABLE 3.4.3-3

Assessment of Minor Route Variations Requested by Stakeholders After Issuance of the Draft EIS

Land Parcel ID and Comment ID a	MP	Requested Minor Route Deviation Description	Summary of Rover's Response to the request	FERC Assessment and Conclusion or Recommendation
Helmick, Larry (WV-TY-SCH-080.340, 350 & WV-TY-SCH-081.000 & 082) Comment ID: IND85, PM4-7	SWL 27.0	The commentor states that the route would be within 120 feet of his residence and that the route would cross through the majority of his parcel, limiting future development. Commentor requested route variation to cross hillside east of WV-TY-SHC-080.000 then cross Highway 18 at parcel WV-TY-SHC-085.210	Rover stated that the route is unfeasible due to severe side slope, additional Indiana Bat habitat impacts, and the crossing of two ephemeral streams.	Proposed route acceptable. In addition to the hindrances noted by Rover (and discussed in appendix I), a desktop analysis indicates the requested reroute would also impact at least one additional landowner.
Petersen, Dean and Jenny (OH-MO-SHC-006.000) Comment ID: CO12	SWL 35.3	Commentor states that the proposed route would run directly through an existing residence/hunting cabin on the property and requests a reroute that would avoid the cabin.	Rover stated that alternative routes in this area are severely constrained by topography, and constructing along steep side slopes more than absolutely necessary would increase the potential for hillside slips and maintenance issues, which would affect the scenic nature of the area. Rover does not believe that a reroute in this area is constructible without creating major maintenance issues in the future.	Proposed route not acceptable. Our analysis of desktop data indicates that it is feasible for Rover to adopt a route variation that is constructible and avoids the need to remove the landowner's cabin. We agree that merely shifting the pipeline route to the north or south of the cabin would result in some side-slope construction. However, we have identified a minor alternate configuration that generally follows the natural contours of the topography in the vicinity, avoids the cabin, and keeps side-slope construction to a minimum. **Therefore, we recommend that Rover adopt the route variation as depicted in appendix I2, figure I2-3** or provide documentation of landowner concurrence with an alternate route variation that may better address the landowners concern.
Thornburg & Bean (on behalf of Stephen and Dale Rubel) Comment ID: CO5-2	SEL 2.7	Commentors state the proposed route would run through a spring, below the dam of a pond, then crossing another spring. The route would also be within 20 feet of a cabin that is being built. Commentors request that Rover continue along the Spectra line for an additional 400 feet before veering off to avoid the spring.	Rover stated that they were unable to parallel the existing right-of-way through the commentors' entire parcel due to severe slide slopes; however, they intend to be parallel to the Leach XPress route.	Rover's response acceptable. Our analysis confirms the presence of steep slide slopes along the existing right-of-way. Additionally, given our recommendations in sections 2.2.1.2 and 4.13.7, we conclude that the commentors' concerns regarding the Leach XPress pipeline have been adequately addressed.

TABLE 3.4.3-3 (continued)

Assessment of Minor Route Variations Requested by Stakeholders After Issuance of the Draft EIS

Land Parcel ID and Comment ID a	MP	Requested Minor Route Deviation Description	Summary of Rover's Response to the request	FERC Assessment and Conclusion or Recommendation
Aberegg, Michael (OH-MO-SCL-098.000, OH-MO-SCL-100.000, OH-MO-SCL-101.000) Comment ID: IND91	SEL 19.0	Commentor requests that the pipeline be rerouted off of his property due to multiple pipelines already present.	Rover stated it has routed the proposed pipeline to parallel the existing pipelines through the property to avoid steep slopes and forested areas.	Proposed route not acceptable. The pipeline is only collocated with the Texas Eastern pipeline for a portion of the route on the parcel. We believe Rover's routing of the pipeline parallel to the Texas Eastern pipelines on the southern portion of the commenter's property would limit impacts on the parcel and allow collocation through a larger portion of the parcel. **Therefore, we recommend that Rover adopt the variation as depicted in appendix I2, figure I2-6.**
Forni, Don (OH-MO-SCL-127.000, OH-MO-SCL-128.000) Comment ID: PM6-53	SEL 24.0	Commentor requests reroute of pipeline to opposite side of existing foreign pipelines currently on property to reduce impacts on land and drain tiles.	Rover indicated that the proposed route follows existing easements through the entirety of the tract. However, in July 2016, Rover filed a route variation that moved the pipeline to the opposite side of the existing easement for a portion of OH-MO-127.000.	Proposed route not acceptable. Our desktop analysis indicates the reroute suggested by the commentor would reduce impacts on forested land, wetlands, and waterbodies. Rover's July 2016 adopted variation only addressed a portion of the requested variation from the landowner. **Therefore, we recommend Rover adopt the minor route variation as depicted in appendix I2, figure I2-7.**
Darrah, Glenn (OH-MO-SCL-129.000) Comment ID: IND29	SEL 24.2	Commentor continues to request reroute of the pipeline north of the existing pipeline right-of-way to avoid his drain tile system and move further from the residence.	Rover stated that the requested reroute was not feasible due to the presence of existing pipelines, electrical lines, streams, residences, and side-slopes.	Proposed route not acceptable. Our desktop analysis indicates that a reroute to the opposite side of the existing powerlines is feasible and would limit impacts to the field as well as move the route further from the residence. **Therefore, we recommend Rover adopt the minor route variation as depicted in appendix I2, figure I2-7.**
Taylor, Russel (OH-BE-CC-141.300) Comment ID: IND11	CLL 25.1	Landowner requested that the workspace be reduced to avoid his property and his septic system.	Rover stated that the current workspace is needed for topsoil segregation for the adjacent agricultural land. Rover would work with the landowner to identify the septic system and reduce workspace if appropriate.	Proposed route acceptable. We reviewed the proposed workspace on the property and determined that the workspace is necessary for topsoil segregation. Temporary workspace should not impact septic systems. If the septic system is impact, Rover would be required to repair or replace.

TABLE 3.4.3-3 (continued)

Assessment of Minor Route Variations Requested by Stakeholders After Issuance of the Draft EIS

Land Parcel ID and Comment ID a	MP	Requested Minor Route Deviation Description	Summary of Rover's Response to the request	FERC Assessment and Conclusion or Recommendation
CONSOL Mining Company	CLL 27.9	Landowner requested an alternative to avoid the wetland and stream mitigation area on the parcel. The mitigation site was created as part of the company's OHEPA section 401 and the COE's section 404 permits.	Impacts on these resources would be temporary. Rover would be required to restore the area in accordance with its permits as well as through adherence to its Plan and Procedures. Rover reviewed the commentor's alternative and determined that it did not offer a significant advantage over the proposed route.	Rover's response not acceptable. We reviewed the commentor's requested reroute and have concluded that the route appears feasible. However, we acknowledge that the reroute would result in additional impacts on forested land. We believe that the proposed route is acceptable but may result in a violation of terms and conditions of CONSOL's section 401 and 404 permits. **Therefore, we recommend that Rover either adopt the route variation depicted in appendix I2, figure I2-8 or consult with the appropriate federal and state agencies regarding the crossing of the mitigation site (see recommendation in section 4.4.3).**
Weaver, Sandra (WV-MA-ML-044.500) Comment ID: PM4-6	MJL 8.7	Commentor notes access road passes through her farm and is concerned about the environmental impacts as there is currently no road there.	None provided.	Proposed route acceptable. Rover's access road information identifies the access road on the property as an existing graveled road. Our review of aerial photos indicates that there appears to be an existing unpaved road at this location, confirming Rover's data. Rover proposes temporary use of the existing road; we find this acceptable.
Otte, Michael and Denise (WV-MA-ML-055.500) and Mark Otte (WV-MA-55.000) Comment ID: IND105, IND113, PM4-22	MJL 10.7	Commentors request reroute of pipeline to the east along the property line to avoid a water collection system associated with springs on the property.	Rover indicated that its personnel discussed the water system on the property extensively with the Ottes. Rover has designed the crossing of the tract to minimize disruptions to and will conduct pre and post-construction testing of all wells or springs within 150 feet of the construction right-of-way. Rover proposed a reroute farther east from the proposed route (but not at the property line) but the landowners declined the offer.	Proposed route acceptable. The landowners' requested reroute would result in increased impacts on forested land. The proposed route crosses about 330 feet of forested land on the property. The requested reroute would cross more than 600 feet of forested land. We were unable to identify a more viable route that would result in fewer impacts on forest habitat, waterbodies, or other landowners. Therefore, in conjunction with Rover's proposed mitigation measures for water wells and springs, we conclude that the proposed route is acceptable.

TABLE 3.4.3-3 (continued)

Assessment of Minor Route Variations Requested by Stakeholders After Issuance of the Draft EIS

Land Parcel ID and Comment ID a	MP	Requested Minor Route Deviation Description	Summary of Rover's Response to the request	FERC Assessment and Conclusion or Recommendation
Craig Wilson of the Emens & Wolper Law Firm (on behalf of Shane Florence) (OH-BE-ML-021.000) Comment ID: CO23	MJL 13.5	Requested a reroute of the pipeline 50 to 100 feet to either side of current route so that the pipeline is off of the ridge where the landowners plan to build a home.	Rover stated that alternative routes in this area are severely constrained by topography. Construction along steep side slopes more than absolutely necessary would increase the potential for hillside slips and maintenance issues. Rover does not believe that a reroute in this area is constructible without creating major maintenance issues in the future.	Proposed route not acceptable. Desktop review indicates rerouting the pipeline off of the ridge on the commentor's parcel is feasible. Therefore, **we recommend that Rover adopt the route variation identified in appendix I2, figure I2-9** or file an alternate variation acceptable to the landowner.
Zagari Jr., Rocco (PA-WA-HL-040.000) Comment ID: IND60	BGL 1.0	Landowner is concerned that the pipeline would cut off his horses from their barn and water supply, and impact the pasture land. Requested to reroute pipeline pathway between or behind (north of) barns on the landowner's property.	The requested reroute would involve placing the 36-inch Burgettstown Lateral between barns that are approximately 80 feet apart and would involve impacts on an existing water well between the barns and the road.	Rover's response not acceptable. We were unable to identify a viable route preferable to the proposed route. Desktop review confirms Rover's response. Additionally, rerouting of pathway east of the landowner's barn would result in long-term impacts on upland forest habitat; whereas the proposed route would result in temporary loss of access to pasture. However, while we did not identify a reroute on the property that is technically feasible, since Rover did not provide information that it had coordinated with the landowner to avoid impacts on the landowner's horses, **we recommend that Rover maintain access to the barn and water supply, during construction, for the horses on the property.**
Dewey, Barbara, S.; Stillwater, Ann and J.D. (OH-HR-042.510; OH-HR-042.516) Comment ID: IND107	MAB 14.0	Commentors are concerned about the pipeline's route through a class III wetland and two springs. Commentors request that the pipeline continue in the northwest direction as it exits parcel OH-HR-42.505 in order to cross through meadows that are frequently drained to avoid the commentors' property.	The reroute requested by the landowner would impact multiple new landowners currently unaffected by the Rover Project. In addition, several waterbodies and a forested area lie within the proposed reroute.	Proposed route acceptable. Our desktop review confirms the requested reroute would affect landowners not currently impacted by the pipeline route and impact additional waterbodies and forested habitat. Rover's proposed mitigation measures for wells and springs as well as wetland construction techniques would help to reduce impacts.

TABLE 3.4.3-3 (continued)

Assessment of Minor Route Variations Requested by Stakeholders After Issuance of the Draft EIS

Land Parcel ID and Comment ID a	MP	Requested Minor Route Deviation Description	Summary of Rover's Response to the request	FERC Assessment and Conclusion or Recommendation
Miller, Sherry and Carl (OH-CA-016.000) Comment ID: IND6, IND43, IND67, IND90, IND125, IND128	MAB 22.0	Commentors raised concerns that the route would be located over an abandoned mine. Additionally, the commenters stated concerns that the construction workspace would be located through their pet cemetery and within 150 feet of their water well. Additionally, they stated that the route would go through their chicken coop, and were concerned about the proximity to their home. Commentors requested the route be adjusted off of their property at least one mile away.	Rover stated the reroute off of the property would impact several new landowners. Rover has adjusted the construction workspace on the property to minimize impacts to the parcel. The route would not impact the chicken coop and Rover would install an air bridge over the pet cemetery.	Proposed route acceptable. As discussed in table 3.4.3-1 and appendix I, a reroute around the commentors' parcel would impact additional landowners.
Goff, Lawrence (OH-ST-022.000) Comment ID: IND134	MAB 43.8	Requested a reroute of the pipeline to the north of its current location to avoid his spring capture zone.	Not provided.	Proposed route acceptable. Rerouting the pipeline north of the mapped spring capture zone would impact several new landowners, including moving the route closer to several residences. See section 4.3 for a discussion on mitigation for impacts on springs.
Lahr, Terrence (OH-ST-024.000) Comment ID: IND37, IND76, IND95, IND124	MAB 44.0	Requested a reroute of the pipeline pathway along the southern border of parcel OH-ST-024.000 and through four additional parcels south of OH-ST-024.000 to allow clear-cut of preferred southern edge of parcel and to maintain road access to landowner's property.	The requested reroute would affect four additional property owners not currently affected by the Rover Project and would cause increased impacts on forested wetlands. Accommodations can be made to maintain road access to property.	Proposed route not acceptable. See our conclusion for the landowner's reroute request in table 3.4.3-1 where we have recommended a minor route variation that would address some of the landowner's concerns, but would not impact any additional landowners. .
Schmuki, Patsy (assumed, OH-ST-045.000) Comment ID: IND139, PM6-35	MAB 50.0	Commentor requests moving (assumed) MLA & MLB MLV # 5 to pasture area so as not to cause loss of crop area.	The MLV is sited in the southwest corner of the parcel along a road. The MLV is about 2,400 feet from the house and is separated by trees.	Proposed route acceptable. The MLV is located in the corner of the parcel adjacent to a roadway. The land outside of the fence line of the MLV could continue to be cultivated during operation of the pipeline.

TABLE 3.4.3-3 (continued)

Assessment of Minor Route Variations Requested by Stakeholders After Issuance of the Draft EIS

Land Parcel ID and Comment ID a	MP	Requested Minor Route Deviation Description	Summary of Rover's Response to the request	FERC Assessment and Conclusion or Recommendation
Masters, Robert C. (OH-WA-016.500) Comment ID: IND88	MAB 54.6	Route pipeline along property line fences to limit impacts on agricultural land and drain tiles.	No response.	Proposed route acceptable. The current route crosses the corner of the parcel. Routing the parcel along the northern fence line would result in several structures, including a residence on a neighboring parcel, to be within the construction workspace. Routing the pipeline further to the south along the southern fence line would impact more of the landowner's property as well as result in a longer pipeline.
Sautter, Greg (OH-WA-052.510) Comment ID: PM6-25	MAB 66.4	Commentor raised concerns about the proximity of the pipeline to his home.	No response.	Proposed route acceptable. As discussed in table 3.4.3-1 and appendix I, in June 2015 Rover adjusted the route on the parcel to accommodate several landowner concerns; however, the route was moved closer to the home. Based on our analysis, moving the route further to the north of the originally proposed route would impact additional landowners. As we are unable to identify the specific locations of the landowner's other features of concern, we conclude that the currently proposed route is acceptable. See section 4.12 regarding safety of the pipeline.
Dyer, Thomas and Caryn (OH-WA-100.000) Comment ID: IND10	MAB 78.5	Reroute the pipeline 100 feet northward to move pathway off of landowner's property.	The requested reroute would affect the alignment on adjacent landowners and would increase the crossing length of each of those tracts.	Proposed route acceptable. Desktop review indicates rerouting the pipeline would increase the crossing length of the pipeline on adjacent properties.
Rettig, Rob (OH-HE-043.000 / OH-HE-049.000 / OH-HE-059.000) Comment ID: IND20, PM1-4	MAB 196.2	Reroute the pipeline by 84 feet at either end of a half mile section within the landowner's property. This would result in the pipeline running exactly parallel to the existing tile lines and would eliminate the need for collector mains.	Rover has determined that the reroute is acceptable. In April 2016, Rover adopted the requested reroute.	Proposed variation acceptable. Based on available information, we conclude landowner concerns have been resolved.

TABLE 3.4.3-3 (continued)

Assessment of Minor Route Variations Requested by Stakeholders After Issuance of the Draft EIS

Land Parcel ID and Comment ID a	MP	Requested Minor Route Deviation Description	Summary of Rover's Response to the request	FERC Assessment and Conclusion or Recommendation
Hornish, Phil (OH-DE-025.000); Steingrass, William (OH-DE-026.000); Schlosser, Evelyn Hornish (OH-DE-027.000); Hornish, Harold and Jean (OH-DE-028.000) Comment ID: IND66, IND79, IND104,	MAB 206.4 to MAB 207.7	The commentors' requested a reroute along four parcels to decrease impacts on their drainage systems. The commenters requested that the pipeline angle change slightly on parcel OH-DE-025.000 in order to avoid a drain tile system; then route the pipeline along the existing right-of-way through parcel OH-DE-26.000, then run parallel to the east side of parcel OH-DE-027.000 and along the north side of the wooded area on parcel OH-DE-028.000	Rover has adopted the requested reroutes for parcels OH-DE-025.000 and OH-DE-026.000. Rover cannot adopt the requested reroutes for parcels OH-DE-027.000 and OH-DE-28.000 because of the 90 degree turn that would be required of the two 42-inch-diameter pipelines at the north side of parcel OH-DE-028.000. Additionally, the reroute would increase impacts on forested wetlands and potential bat habitat.	Proposed response acceptable. Rover has adopted the requested route variation for two of the parcels. We were unable to identify a viable route preferable to the proposed route for the other two parcels. Desktop review indicates variations of the requested reroute that would not require a 90 degree turn of the pipelines would increase impacts on forested wetlands and potential bat habitat. Reroutes south of the proposed route would avoid forested wetlands but would result in one or more homes within the construction workspace and impacts on landowners not currently affected by the Rover Project.
Schiel, Sallie J, and Sue C. (MI-WA-017.000) Comment ID: IND92	MS 60.3	Commentor requests pipeline route follow property lines and/or existing right-of-ways.	As the area is surrounded by forested area, any reroute through the area would impact similar resources.	Proposed route acceptable. No specific reroute provided; desktop analysis indicates reroutes would either impact new landowners or provide no significant environmental advantage.

TABLE 3.4.3-3 (continued)

Assessment of Minor Route Variations Requested by Stakeholders After Issuance of the Draft EIS

Land Parcel ID and Comment ID a	MP	Requested Minor Route Deviation Description	Summary of Rover's Response to the request	FERC Assessment and Conclusion or Recommendation
Daniel, David A & Daniel, Jeanne L. Trust (MI-WA-043.000; MI-WA-043.000) Comment ID: IND5, IND89, IND123, IND126, IND127, IND131	MS 65.0	In order to avoid a stream and forested wetland on the property, the commentor requests to reroute the pipeline closer to the southern border of the parcel.	The pipeline was rerouted in June 2015 to avoid closely paralleling and multiple crossings of a stream and wetland complex as depicted in the Appendix 10F within the June 2015 supplemental filing to FERC. The reroute crosses the same landowners as the previous route. Prior to field surveys, Rover had estimated resources on the property by publicly available data. Following field surveys, Rover was able to verify and refine the types, locations, and extent of ecological resources on the property to calculate the proposed impacts and accurately permit and mitigate with applicable agencies. Similar stream and wetland complexes are present on adjacent properties.	Proposed route not acceptable. After the issuance of the draft EIS, Rover provided the FERC with updated survey data for the parcel. Desktop review indicates that a slight adjustment of pipeline right-of-way towards the southern borders of MI-WA-043.000 and MI-WA-044.000 would avoid impacting the newly identified forested wetlands. **Based on our analysis, we recommend that Rover adopt this minor route variation (see appendix I2, figure I2-10).**
Roberts, Catherine (Land Parcel ID not provided) Comment ID: IND54	MS 67.8	The commentor raised concerns regarding the proximity of the pipeline to residences along Reno Road and to Pleasant Lake. Commentor requests reroute of pipeline near MK-MLV-06 to west side of existing compressor station and gravel quarry to move it further from residences and the lake.	The commentor incorrectly states that the route is 50 feet from homes along Reno Road. The pipeline would actually be about 550 feet from those residences. Additionally, the construction workspace is over 700 feet from the lake. The current route minimizes impacts on residential housing as well as Pleasant Lake.	Proposed route acceptable. Desktop analysis indicates reroute of pipeline at this location would impact multiple new landowners not currently affected by the pipeline, would result in the pipeline centerline crossing several residences, and would impact 0.4 mile of forested habitat.

TABLE 3.4.3-3 (continued)				
Assessment of Minor Route Variations Requested by Stakeholders After Issuance of the Draft EIS				
Land Parcel ID and Comment ID <u>a</u>	**MP**	**Requested Minor Route Deviation Description**	**Summary of Rover's Response to the request**	**FERC Assessment and Conclusion or Recommendation**
Marhofer/ Cambell Development Co., LLC (MI-WA-101.000 / MI-WA-103.000) Comment ID: CO16	MS 79.0	The commentor was concerned about the proximity of the pipeline to the company's planned development. Requested to reroute the pipeline along the existing easement owner by IPL Toledo Pipeline.	In this area Rover has proposed to move further into the ITC corridor, further from the proposed residences as depicted in the March 2016 supplemental information filed with FERC. No aboveground facilities are proposed in this area.	Proposed variation acceptable. With the adoption of the variation, Rover has moved the pipeline further from the proposed development. Moving the pipeline to the east of the IPL Toledo pipeline (as requested by the landowner) would result in the centerline of the pipeline directly crossing a residential home and therefore would not be a viable alternative.
Kaiser, Joan (MI-WA-125.000 / MI-LI-001.000) Comment ID: IND45	MS 84.3	Requested a reroute of the pipeline closer to the east property line instead of through the middle of the property to limit impacts on the parcel.	These properties are within and adjacent to a residential area on Silver Lake. The pipeline is proposed to be installed as far from the residences as possible while right at the edge of the slopes of the Portage River banks.	Rover's response acceptable. We have reviewed the proposed route through the parcels. Moving the pipeline route further to the east would result in additional impacts on wetlands and could potentially increase the length of pipeline through forested area. However, as discussed in section 3.4.1.3, we are recommending that Rover adopt the Market Segment Section 2 Alternative, which would result in this parcel no longer being crossed by the Rover Project.
Todd Chapman (MI-LI-004.500) Comment ID: IND36	Not crossed	Commentor requested a reroute of the pipeline off of his property. The commentor stated that his parcel was not large and routing of the pipeline through his parcel would impact a large part of his yard. Additionally, he was concerned about the safety of the pipeline in proximity to his home.	The commentor's parcel is not crossed by the proposed route due to a reroute adopted in June 2015.	Rover's response acceptable. The currently proposed route does not cross the commentor's parcel. However, as discussed in section 3.4.1.3, we are recommending that Rover adopt the Market Segment Section 2 Alternative, which would result in the recommended route crossing this parcel. The house would be almost 400 feet from the construction workspace and about 500 feet from the centerline of the recommended route. The route would follow the existing ITC corridor along the along the eastern edge of the property boundary.

<u>**a**</u> Letters received after issuance of the draft EIS were assigned a comment ID number. See appendix T for the response to comments matrix.

3.5 ABOVEGROUND FACILITY SITE ALTERNATIVES

We evaluated the locations of the proposed aboveground facilities to determine whether environmental impacts would be reduced or mitigated by the use of alternative sites for these facilities. Our evaluation involved inspection of aerial photography and mapping. The aboveground facilities for the proposed Rover Project include 10 compressor stations, 19 meter stations, 5 tie-in facilities, mainline valves, and pig launchers/receivers (typically located inside compressor or meter station sties). In the discussion that follows, the analyses of meter stations that are collocated with a compressor station are encapsulated in the discussion for the corresponding compressor station.

3.5.1 Compressor Station Alternatives

Rover has proposed 10 compressor stations along the Supply Laterals and Mainlines A and B routes. During the pre-filing process, Rover identified and evaluated alternative locations for all 10 compressor stations as part of its site-selection process. Our analysis of alternative compressor sites was driven by comments discussing specific issues of concern with the sites and our independent consideration of the sites' impacts. As a result, we evaluated alternative sites for two compressor stations: the Burgettstown Compressor Station and the Mainline Compressor Station 2. Consideration of alternative sites concentrates on avoiding or minimizing impacts on forested land, wetlands, and waterbodies and on siting the facility as far as practicable from NSAs. Additionally, evaluation of potential sites must consider the presence of suitable access roads and the location of ancillary facilities, such as electric distribution lines.

3.5.1.1 Burgettstown Compressor Station

Early in the application process, Rover's preferred location for the Burgettstown Compressor Station encompassed 14.6 acres of open land and 1.1 acres of forested land. Rover has since changed this preferred location to encompass 19.1 acres of predominately forested land within the same parcel as the original location (see table 3.5-1 and figure 3.5-1). The original site is now considered Alternative Site 1. Alternative Site 1 would require the least amount of forest clearing. In the draft EIS, we recommended that Rover adopt the Alternative Site 1. However, Rover states that while the proposed site and the Alternative Site 1 site are located within the same parcel, the landowner was not willing to sell the portion of the land on which the Alternative Site 1 is located. Given that the landowner was unwilling to sell the portion of the parcel on which Alternative Site 1 is located, and that the proposed site is considered environmentally acceptable (i.e., we did not identify any significant issues with the location that required avoidance of the site altogether) we are no longer recommending adoption of the alternative.

TABLE 3.5-1 **Comparison of the Proposed Site to Burgettstown Compressor Station Site Alternatives**			
Environmental Factor	**Unit**	**Alternate Site 1 (Originally Proposed)**	**Proposed Site**
Total site size	acres	15.7	19.1
Forest land	acres	1.1	15.3
Agricultural land	acres	0.0	0.0
Open land	acres	14.6	3.8
NWI wetlands	acres	0.0	0.1
Nearest residence (direction)	feet	1,150 (S)	1,130 (NW)
Within floodplain	--	No	No
Parcel available for purchase	--	No	Yes

NWI – National Wetlands Inventory
Note: All calculations are based on publicly available GIS data.

3.5.1.2 Mainline Compressor Station 2

Since filing its application, Rover identified a new location for the Mainline Compressor Station 2 to accommodate route adjustments adopted along the Mainlines A and B route. The currently proposed site for the Mainline Compressor Station 2 encompasses 21.4 acres consisting predominately of agricultural land with some forested land (see table 3.5-2 and figure 3.5-2). The alternative site is a 27.3-acre parcel predominately of agricultural lands with a small amount of open land. Both sites contain wetland areas; however, Rover has designed the layout of the proposed site such that the aboveground facilities would not permanently impact any wetlands. Based on our assessment of the alternative site (and lack of comments on the specific parcel in question), we did not find a significant environmental advantage over the proposed site. Therefore, it is not evaluated further.

TABLE 3.5-2 **Comparison of the Proposed Site to the Mainline Compressor Station 2 Site Alternative**			
Environmental Factor	**Unit**	**Alternative Site**	**Proposed Site**
Total site size	acres	27.3	21.4
Forest land	acres	0.0	0.6
Agricultural land	acres	26.5	20.6
Open land	acres	0.8	0.2
NWI wetlands	acres	<0.1	8.6
Nearest residence	feet	890 (NE)	1,230 (E)
Within floodplain	--	No	No
Parcel available for purchase	--	Yes	Yes

NWI – National Wetlands Inventory
Note: All calculations are based on publicly available GIS data.

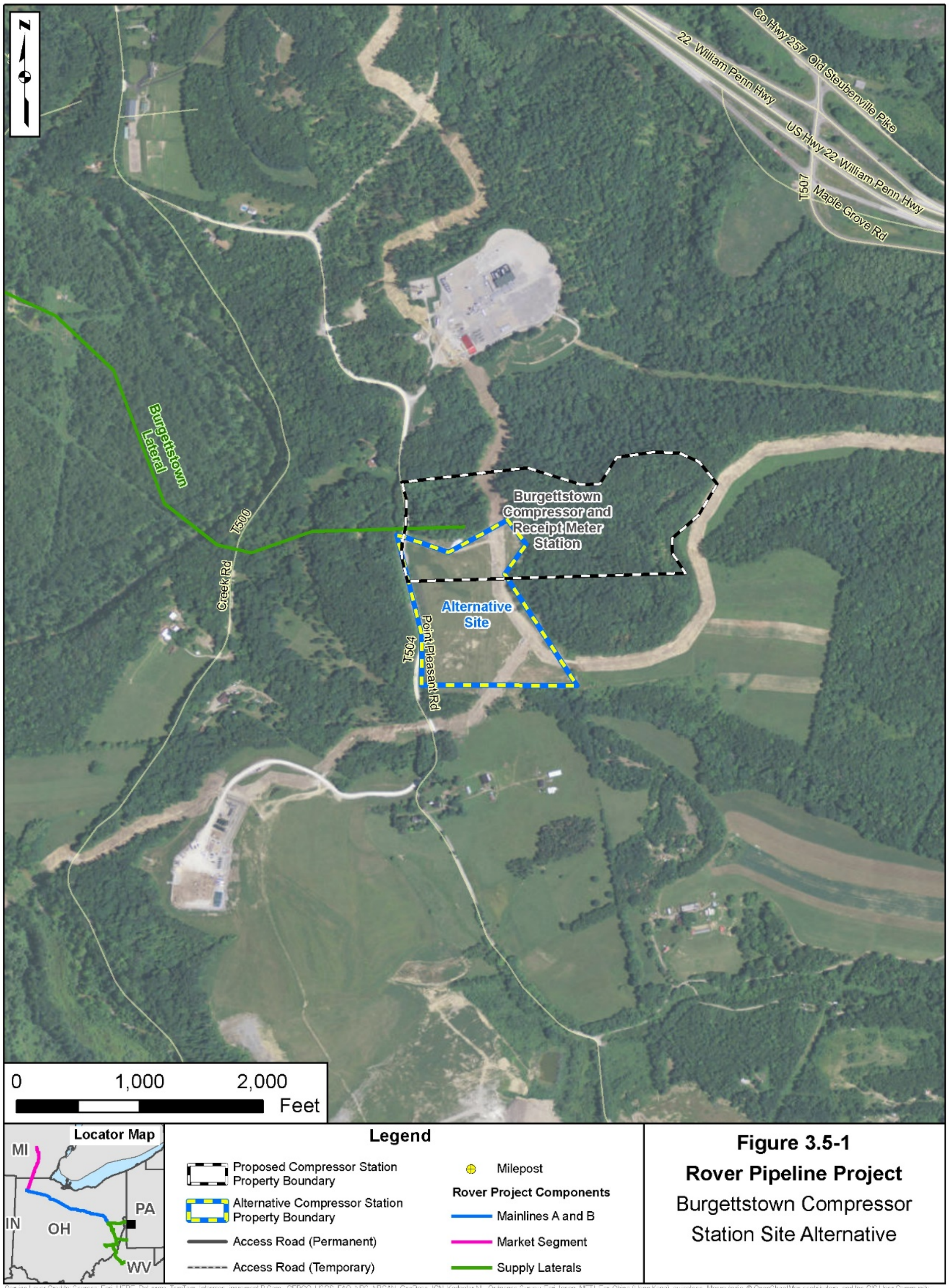


Figure 3.5-1
Rover Pipeline Project
Burgettstown Compressor Station Site Alternative

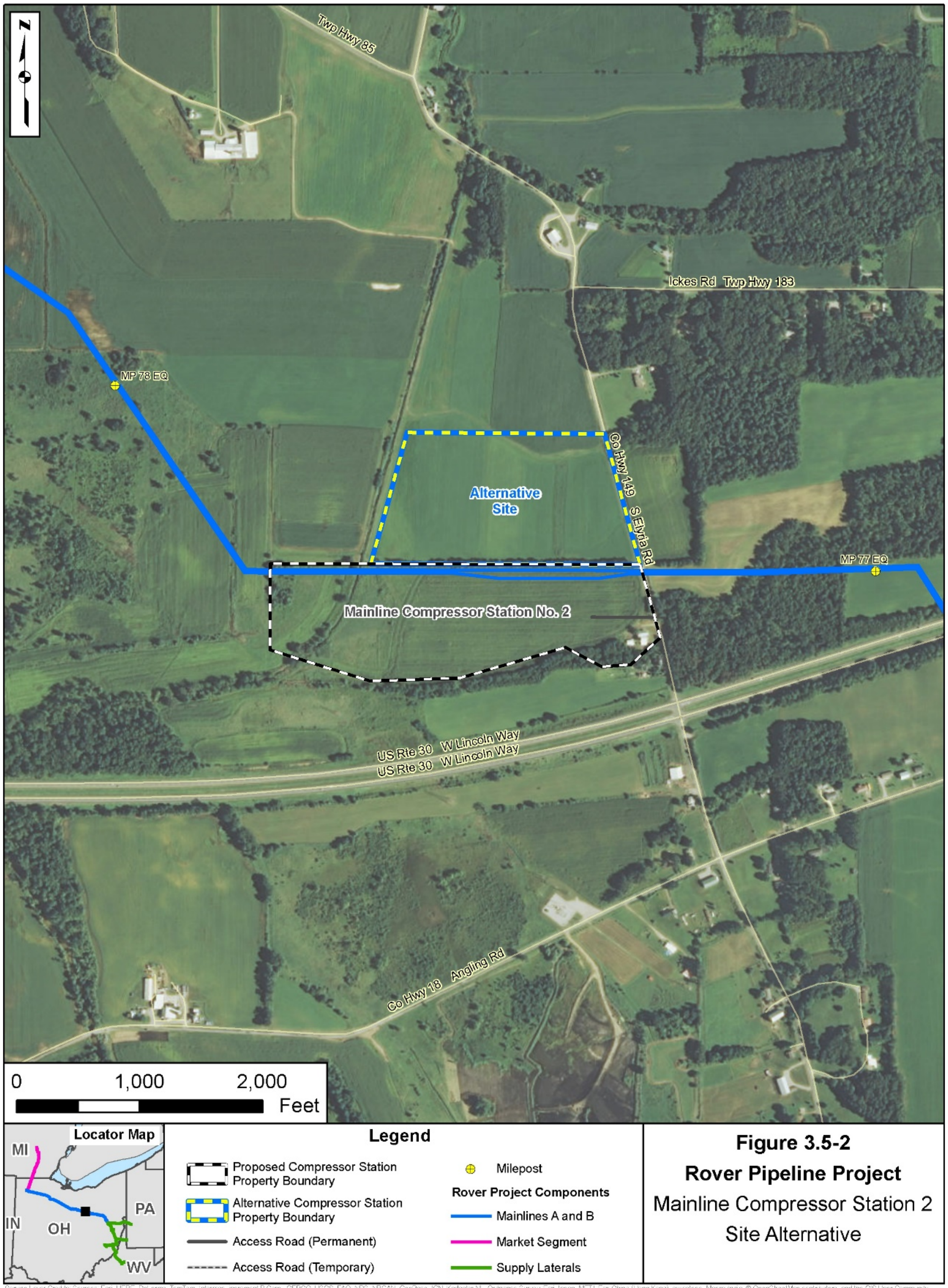


Figure 3.5-2
Rover Pipeline Project
Mainline Compressor Station 2
Site Alternative

3.5.2 Electric Compressors

Because electric compressors have the ability to reduce air and noise impacts, we analyzed the feasibility of using electric motor-driven compressor units in lieu of the proposed natural gas-fired compressor units at the Rover compressor stations. Although technically feasible, Rover stated that the use of electric units would fail to meet the Rover Project's purpose and need due to the following: (1) the amount of time required to install required electrical supply to each compressor station site; and (2) the greater capital and operating costs required for electric units, which would exceed contractual requirements.

Electric power required to operate one 45,000-horsepower compressor station would be approximately 34,000 MW—a substantial load that would require upgrades to existing infrastructure. Rover estimated a timeframe of 2 to 5 years for sufficient electrical supply to be in place, which would prevent the Rover Project from being in service per the terms of contractual agreements. Also, newly constructed substations could be necessary depending on the distance to the closest existing substation. These facilities would likely result in additional environmental impacts and additional burdens on landowners.

The electric transmission lines would cause significant costs to the Rover Project, while the proposed gas-driven compressor stations could be supported with the existing power lines located in proximity through site selection. The cost of using electric power for the compressors would increase the operating cost of the station.

Finally, gas-driven internal combustion engines are generally preferred over electric compression to provide reliable, uninterrupted natural gas transmission because the fuel supply does not require a third-party for operation. Gas-driven emergency generators with capacity to power electric compressors would be infeasible, and would be significantly larger than the proposed internal combustion engines. For these reasons, we conclude that electric-driven compressor units at the proposed Rover compressor stations would not offer a significant environmental advantage over the proposed gas-driven internal combustion engines.

3.5.3 Meter Stations

Because 11 meter stations would be collocated with proposed compressor stations, those facilities were evaluated in association with their respective compressor station sites. For the eight stand-alone meter stations, the search for alternatives was constrained to adjacent areas that could accommodate shipper receipt points. The five meter stations associated with the Supply Laterals include the CGT, Hall, Gulfport, Berne, and Majorsville Meter Stations. The remaining three meter stations are associated with the Mainlines A and B or the Market Segment and include the ANR, Consumers Energy, and Vector Meter Stations. Rover did not identify alternative sites for the CGT, Hall, Gulfport, or Vector Meter Stations as these sites met the Rover Project needs, had landowners willing to sell or lease parcels for the facility, and were found to have limited environmental impacts. These sites are predominately agricultural lands, with some open land, and would affect less than 0.1 acre of forest land (see table 4.8.1-1). Therefore, these sites are not further evaluated. For the remaining meter stations, we did not identify any reasonable alternative sites for the proposed meter stations that would offer an environmental advantage to the proposed sites. Therefore, we find the proposed sites to be acceptable.

3.5.4 Other Aboveground Facilities

The locations of mainline valves along the proposed pipeline route were partly determined based on DOT safety regulations that specify the maximum distance between sectionalizing block valves and require that these facilities be located in readily accessible areas. All mainline valve locations are within proposed aboveground facilities or permanent rights-of-way. We did not identify any significant environmental constraints with the proposed valve locations, nor did we receive comments concerning the locations of the valves. Therefore, given the limited footprint of the mainline valves and the considerations above, alternatives to their locations were not evaluated.

4.0 ENVIRONMENTAL ANALYSIS

This section of the EIS primarily provides our analysis of impacts associated with construction and operation of the Rover Project and the proposed modifications and upgrades to the Panhandle and Trunkline pipeline systems. As discussed in section 2.3.3, these proposed modifications and upgrades at existing facilities, including four existing compressor stations and three valve sites along Panhandle's existing pipeline system and four existing compressor stations and one meter station along Trunkline's existing pipeline system, would involve limited ground disturbance on previously impacted lands owned or leased by the applicants. Except as noted in the subsections below, the proposed modifications and upgrades at the compressor stations, meter station, and valve sites would not impact environmental resources.

The environmental consequences of constructing and operating the Projects would vary in duration and significance. Four levels of impact duration were considered: temporary, short-term, long-term, and permanent. Temporary impacts generally occur during construction with the resource returning to pre-construction condition almost immediately afterward. Short-term impacts could continue for up to about 3 years following construction. Impacts were considered long-term if the resource would require more than about 3 years to recover. A permanent impact could occur as a result of any activity that modifies a resource to the extent that it would not return to pre-construction conditions during the life of the Projects. We considered an impact to be significant if it would result in a substantial adverse change in the physical environment.

The applicants, as part of their proposals, developed certain mitigation measures to reduce the impact of the Projects. In some cases, we determined that additional mitigation measures could further reduce the Projects' impacts. Our additional mitigation measures appear as bulleted, boldfaced paragraphs in the text of this section and are also included in section 5.2. We will recommend to the Commission that these measures be included as specific conditions in any Certificate the Commission may issue to the applicants for these Projects.

The conclusions in the EIS are based on our analysis of the environmental impact and the following assumptions:

- the applicants would comply with all applicable laws and regulations;
- the proposed facilities would be constructed as described in section 2.0 of the EIS;
- the applicants would implement the mitigation measures included in their applications and supplemental submittals to the FERC and cooperating agencies, and in other applicable permits and approvals; and
- the applicants would comply with our recommended mitigation measures.

4.1 GEOLOGY

4.1.1 Geologic Setting

The Projects would cross several physiographic provinces and sections as well as a wide variety of bedrock, surficial geology, and topography. The Rover Project would cross the Appalachian Plateau Province and Central Lowlands Province in Pennsylvania, West Virginia, Ohio, and Michigan (Fenneman et al., 1946). The Panhandle and Trunkline Projects would be located in the Coastal Plain Province and the Central Lowlands Province in Michigan, Ohio, Indiana, Illinois, Tennessee, and Mississippi (Fenneman et al., 1946). Table 4.1.1-1 provides details for the Projects' physiography, general geologic formations, relief and elevation ranges, slope characteristics, overburden type, and bedrock type. Descriptions of the geologic conditions present along the Projects are provided below.

4.1.1.1 Pipeline Facilities

Pipeline facilities for the Rover Project include Supply Laterals, Mainlines A and B, and Market Segment components. The Panhandle and Trunkline Projects do not include any new pipeline facilities.

Supply Laterals

The Supply Laterals component of the Rover Project would be located in Pennsylvania, West Virginia, and Ohio. These areas are characterized as a dissected plateau with steep relief ranging from 160 to 330 feet. Relief decreases as the pipeline route progresses from east to west. According to the U.S. Geological Survey (USGS), the majority of bedrock in this area is comprised of the Conemaugh and Dunkard Groups, which consist of sandstone, siltstone, mudstone, and shale (USGS, 2007a, 2008). Surficial geology consists of colluvium, bedrock, and a small amount of glacial lake deposits. The majority of surficial geology in Pennsylvania and Ohio is made up of colluvium (OHDGS, 2005; USGS, 2003a). In West Virginia, sandstone, siltstone and shale bedrock is exposed at the surface, and the overburden material is mainly absent but consists of very thin colluvium when present (USGS, 2003a). Table 4.1.1-2 provides additional detail on the surficial geology that would be crossed.

Mainlines A and B

Mainlines A and B would be located entirely within Ohio, starting in southeast Ohio and crossing the majority of the state in a northwesterly direction. Topography along these pipelines would transition from the steep high relief areas of eastern Ohio with average relief ranging from 160 to 330 feet to moderate and then low relief in northcentral Ohio with average relief ranging from a few feet up to 100 feet. The majority of the bedrock in this area consists of the Allegheny and Pottsville groups, and the Lockport Dolomite, as well as the Maxville Limestone, Rushville, Logan, and Cuyahoga Formations (USGS, 2007a). Approximately 85 percent of the surficial geology that would be crossed in this area consists of glacial deposits (OHDGS, 2005; USGS, 2003a).

TABLE 4.1.1-1

Summary of Physiographic and Geologic Characteristics along the Projects

Pipeline Segment	Start MP	End MP	Physiographic Province	Physiographic Section(s)	Relief Ranges (ft)	Range in Elevation (ft, AMSL) a	Slope	Overburden Type	Age and Bedrock Type	Bedrock Depth (ft BGS)	Associated Aboveground Facility(s)
ROVER PIPELINE PROJECT SUPPLY LATERALS											
Sherwood Lateral	0.0	54.1	Appalachian Plateaus	Kanawha Section: Central Allegheny Plateau	780	602-1,382	steep to very steep ridges and valleys	river alluvium	Pennsylvanian sedimentary rocks	2.3 - >5.0	Sherwood Compressor and Meter Station
CGT Lateral	0.0	5.7	Appalachian Plateaus	Kanawha Section: Central Allegheny Plateau	780	602-1,382	steep to very steep ridges and valleys	river alluvium	Pennsylvanian sedimentary rocks	2.3 - >5.0	CGT Meter Station
Seneca Lateral	0.0	25.6	Appalachian Plateaus	Kanawha Section: Central Allegheny Plateau	780	602-1,382	steep to very steep ridges and valleys	river alluvium	Pennsylvanian sedimentary rocks	2.2 - >5.0	Seneca Compressor Station; and Seneca, REX, Hall, Madison, Clarington, and Gulfport Meter Stations
REX Interconnect	0.0	0.2	Appalachian Plateaus	Kanawha Section: Central Allegheny Plateau		1,100-1,200	steep to very steep ridges and valleys	River alluvium	Pennsylvanian sedimentary rocks	2.2->5.0	REX Interconnect
Berne Lateral	0.0	3.7	Appalachian Plateaus	Kanawha Section: Central Allegheny Plateau	780	602-1,382	steep to very steep ridges and valleys	river alluvium	Pennsylvanian sedimentary rocks	2.2 - >5.0	Berne Meter Station
Clarington Lateral	0.0	32.7	Appalachian Plateaus	Kanawha Section: Central Allegheny Plateau	780	602-1,382	steep to very steep ridges and valleys	river alluvium	Pennsylvanian sedimentary rocks	2.1 - >5.0	Clarington Compressor and Meter Station
Majorsville Lateral	0.0	9.0	Appalachian Plateaus	Kanawha Section: Central Allegheny Plateau	780	602-1,382	steep to very steep ridges and valleys	river alluvium	Pennsylvanian sedimentary rocks	2.6 - >5.0	Majorsville Compressor and Meter Station
Cadiz Lateral	0.0	2.9	Appalachian Plateaus	Kanawha Section: Central Allegheny Plateau	780	602-1,382	steep to very steep ridges and valleys	river alluvium	Pennsylvanian sedimentary rocks	>5.0	Cadiz Compressor and Meter Stations

TABLE 4.1.1-1 (continued)

Summary of Physiographic and Geologic Characteristics along the Projects

Pipeline Segment	Start MP	End MP	Physiographic Province	Physiographic Section(s)	Relief Ranges (ft)	Range in Elevation (ft, AMSL) a	Slope	Overburden Type	Age and Bedrock Type	Bedrock Depth (ft BGS)	Associated Aboveground Facility(s)
Supply Connector Lines A and B	0.0	18.8	Appalachian Plateaus	Kanawha Section: Central Allegheny Plateau	330	904-1,301	steep to very steep ridges and valleys	river alluvium	Pennsylvanian sedimentary rocks	2.3 - >5.0	None
			Appalachian Plateaus	Kanawha Section: Western Allegheny Plateau	160-330	904-1,301	rolling ridge tops, hilly to steep slopes	glacial drift	Pennsylvanian sedimentary rocks	2.3 - >5.0	None
Burgettstown Lateral	0.0	51.3	Appalachian Plateaus	Kanawha Section: Central Allegheny Plateau	330	646-1,331	steep to very steep ridges and valleys	river alluvium	Pennsylvanian sedimentary rocks	1.6 - >5.0	Burgettstown Compressor and Meter Stations
			Appalachian Plateaus	Kanawha Section: Western Allegheny Plateau	160-330	646-1,331	rolling ridge tops, hilly to steep slopes	glacial drift	Pennsylvanian sedimentary rocks	1.6 - >5.0	None
ROVER PIPELINE PROJECT MAINLINES											
Mainlines A and B	0.0	68.0	Appalachian Plateaus	Kanawha Section: Western Allegheny Plateau	160-330	656-1,312	rolling ridge tops, hilly to steep slopes	glacial drift	Pennsylvanian sedimentary rocks	1.9 - >5.0	Mainline Compressor Station 1
	68.0	101.0	Appalachian Plateaus	Lake Erie Glaciated Plateau	7-50	656-1,312	steep valley walls	glacial till, outwash, glacial lake sediments and stratified drift deposits, and some modern stream deposits	Devonian, Mississippian and Pennsylvanian sedimentary rocks	2.3 - >5.0	None

TABLE 4.1.1-1

Summary of Physiographic and Geologic Characteristics along the Projects

Pipeline Segment	Start MP	End MP	Physiographic Province	Physiographic Section(s)	Relief Ranges (ft)	Range in Elevation (ft, AMSL) a	Slope	Overburden Type	Age and Bedrock Type	Bedrock Depth (ft BGS)	Associated Aboveground Facility(s)
	101.0	157.5	Central Lowlands	Till Plains: Indiana and Ohio Till Plain, Eastern Part	mostly a few feet, but can be up to 100 feet	656-1,312	narrow, shallow valleys	glacial till, outwash and lacustrine deposits	Devonian sedimentary rocks	2.9 - >5.0	Mainline Compressor Stations 2 and 3
	157.5	209.4	Central Lowlands	Eastern Lake and Till Plains: Indiana and Ohio Till Plain, Northeastern Part	mostly a few feet, but can be up to 100 feet	656-1,312	flat to undulating	glacial till, outwash and lacustrine deposits, thin loess in some areas	Devonian to Mississippian sedimentary rocks: including limestone and dolostone	0.5 - >5.0	None
			Central Lowlands	Eastern Lake: Erie-Huron Lake Plain	mostly 6 feet, but can be as high as 31 feet	656-1,312	mostly flat	glacial till, outwash and lacustrine deposits	Mississippian to Silurian sedimentary rocks: including limestone and dolostone	>5.0	ANR Meter Station
ROVER PIPELINE PROJECT MARKET SEGMENT											
Market Segment	0.0	100.0	Central Lowlands	Eastern Lake: Erie-Huron Lake Plain	mostly 6 feet, as high as 31 feet	710-997	mostly flat	glacial till, outwash and lacustrine deposits	Mississippian to Silurian sedimentary rocks: including limestone and dolostone	>5.0	Defiance Compressor Station
			Central Lowlands	Eastern Lake and Till Plains: Indiana and Ohio Till Plain, Northeastern Part	mostly a few feet, but can be up to 100 feet	710-997	flat to undulating	glacial till, outwash and lacustrine deposits, thin loess in some areas	Devonian to Mississippian sedimentary rocks: including limestone and dolostone	>5.0	Consumers Energy Meter Station

TABLE 4.1.1-1

Summary of Physiographic and Geologic Characteristics along the Projects

Pipeline Segment	Start MP	End MP	Physiographic Province	Physiographic Section(s)	Relief Ranges (ft)	Range in Elevation (ft, AMSL) a	Slope	Overburden Type	Age and Bedrock Type	Bedrock Depth (ft BGS)	Associated Aboveground Facility(s)
			Central Lowlands	Eastern Lake: Southern Michigan and Northern Indiana Drift Plain	mostly <15 feet, up to 165	710-997	mostly flat, some belts of hills with stronger slopes	glacial till, some unconsolidated sand and gravel outwash	Mississippian to Jurassic sedimentary rocks	>5.0	Vector Meter Station
PANHANDLE BACKHAUL PROJECT											
Edgerton 10 Gate - Valve Setting	N/A	N/A	Central Lowlands	Eastern Lake	N/A	800	mostly flat	glacial and post glacial lake deposits	Devonian shale	>5.0	N/A
Zionsville 3 Gate - Valve Setting	N/A	N/A	Central Lowlands	Eastern Lake	N/A	815	mostly flat	glacial till	Devonian limestone and dolostone	>5.0	N/A
Tuscola 6 Gate/ Mainline Scrubber	N/A	N/A	Central Lowlands	Eastern Lake	N/A	575	mostly flat	glacial till	Pennsylvanian shale and sandstone	>5.0	N/A
Panhandle-Rover Interconnect	N/A	N/A	Central Lowlands	Eastern Lake	N/A	720	mostly flat	glacial till	Devonian limestone and shale	>5.0	N/A
Edgerton Compressor Station	N/A	N/A	Central Lowlands	Till Plains	N/A	755	mostly flat	glacial till	Silurian limestone	>5.0	N/A
Zionsville Compressor Station	N/A	N/A	Central Lowlands	Till Plains	N/A	875	mostly flat	glacial till	Devonian – Mississippian Shale	>5.0	N/A
Montezuma Compressor Station	N/A	N/A	Central Lowlands	Till Plains	N/A	500	mostly flat	glacial till	Pennsylvanian shale and sandstone	>5.0	N/A
Tuscola Compressor Station	N/A	N/A	Central Lowlands	Till Plains	N/A	670	mostly flat	glacial till	Pennsylvanian shale and sandstone	>5.0	N/A

TABLE 4.1.1-1

Summary of Physiographic and Geologic Characteristics along the Projects

Pipeline Segment	Start MP	End MP	Physiographic Province	Physiographic Section(s)	Relief Ranges (ft)	Range in Elevation (ft, AMSL) a	Slope	Overburden Type	Age and Bedrock Type	Bedrock Depth (ft BGS)	Associated Aboveground Facility(s)
TRUNKLINE BACKHAUL PROJECT											
Panhandle-Trunkline Interconnect	N/A	N/A	Central Lowlands	Till Plains	N/A	670	mostly flat	glacial till	Pennsylvanian shale and sandstone	>5.0	Tuscola Compressor Station
Bourbon Meter Station	N/A	N/A	Central Lowlands	Till Plains	N/A	655	mostly flat	glacial till	Pennsylvanian shale and sandstone	>5.0	N/A
Johnsonville Compressor Station	N/A	N/A	Central Lowlands	Till Plains	N/A	505	mostly flat	glacial till	Pennsylvanian shale and sandstone	>5.0	N/A
Joppa Compressor Station	N/A	N/A	Atlantic Coastal Plain	Eastern Gulf Coastal Plain	N/A	380	mostly flat	lake deposits and alluvium	Cretaceous sandstone, clay, and mud	>5.0	N/A
Dyersburg Compressor Station	N/A	N/A	Atlantic Coastal Plain	Eastern Gulf Coastal Plain	N/A	345	mostly flat	loess and loessal alluvium and colluvium	Quaternary silt	>5.0	N/A
Independence Compressor Station	N/A	N/A	Atlantic Coastal Plain	Eastern Gulf Coastal Plain	N/A	140	mostly flat	loess and loessal alluvium and colluvium	Eocene sand clay, or mud	>5.0.	N/A

ft AMSL = feet above mean sea level.

ft BGS = feet below ground surface.

a Elevations (ft AMSL) for the Panhandle and Trunkline Projects were determined using USGS topographic maps and represent the average elevation at the facility modification location.

Sources: Fenneman and Johnson, 1946; USGS, 2003a, 2007a, 2007b, 2008; USDA, 2015

TABLE 4.1.1-2

Surficial Geology Crossed by the Rover Pipeline Project (miles)

Project Component	Surficial Geology	MI	OH	PA	WV
Berne Lateral	Colluvium	0.0	3.7	0.0	0.0
Burgettstown Lateral	Colluvium	0.0	35.9	10.4	0.0
	Lake deposits	0.0	1.7	0.0	0.0
	Bedrock	0.0	0.0	0.0	5.1
Cadiz Lateral	Colluvium	0.0	2.9	0.0	0.0
CGT Lateral	Bedrock	0.0	0.0	0.0	5.7
Clarington Lateral	Colluvium	0.0	32.7	0.0	0.0
Sherwood Lateral	Colluvium	0.0	18.3	0.0	0.0
	Bedrock	0.0	0.0	0.0	35.7
Majorsville Lateral	Colluvium	0.0	11.3	0.0	0.0
	Bedrock	0.0	0.0	0.0	12.6
Seneca Lateral	Colluvium	0.0	25.6	0.0	0.0
Supply Connector Lines A and B	Colluvium	0.0	18.8	0.0	0.0
Mainlines A and B	Colluvium	0.0	9.6	0.0	0.0
	Moraine	0.0	141.5	0.0	0.0
	Kames and eskers	0.0	5.5	0.0	0.0
	Lake deposits	0.0	17.6	0.0	0.0
	Outwash	0.0	9.8	0.0	0.0
Market Segment	Moraine	29.7	14.0	0.0	0.0
	Glacial till	10.8	0.0	0.0	0.0
	Glacial outwash sand and gravel and postglacial alluvium	7.5	0.0	0.0	0.0
	Ice-contact outwash sand and gravel	5.9	0.0	0.0	0.0
	Lake deposits	5.2	14.6	0.0	0.0
	Glacial till	13.4	0.0	0.0	0.0

Sources: USGS, 2007a, 2007b, 2008

Bedrock = Residuum parent bedrock including limestone, shale, siltstone, and sandstone.

Market Segment

The Market Segment component of the Rover Project would be located within northwestern Ohio and southeastern Michigan. Topography in this area is relatively flat in northwestern Ohio and becomes increasingly hilly moving north into Michigan. Topographic relief ranges from 6 to 165 feet with elevations ranging from 710 to 997 feet above mean sea level in this area. The majority of bedrock consists of Antrim Shale, Coldwater Shale, Marshall Sandstone, and the Sunbury and Bedford Formations, with the Coldwater Shale unit being the largest subcomponent (USGS, 2007a, 2007b). The surficial geology in the area of Ohio in which the Market Segment would be located consists of nearly equal portions of glacial deposits. In Michigan, the majority of the surficial geology is the result of glaciation and consists mainly of glacial moraines, tills, and outwash material (see table 4.1.1-2) (Esch, 2012; USGS, 2003a).

4.1.1.2 Aboveground Facilities

Various aboveground facilities would be associated with each of the Rover pipeline components. Six new compressor stations, 2 new delivery stations, 13 new receipt stations, and 2 bi-directional meter stations would be associated with the Supply Laterals. Three new compressor stations and two new delivery stations would be associated with Mainlines A and B, and one new compressor station and two new delivery stations would be associated with the Market Segment. These aboveground facilities would be collocated with the proposed Rover pipelines; therefore, the locations of the aboveground facilities would exhibit physiography and geology similar to the areas crossed by the corresponding pipelines described in section 4.1.1.1.

The Panhandle Project would include modifications to four existing compressor stations and four existing gates along Panhandle's pipeline system. All facilities are in the Central Lowlands Province physiographic region (Fenneman and Johnson, 1946). This area consists of Silurian, Devonian, and Pennsylvanian-age sedimentary bedrock (Vigil et al., 2000) (see table 4.1.1-1). Surficial geology consists generally of glacial deposits.

The Trunkline Project would include modifications at five existing compressor stations and one existing meter station along Trunkline's pipeline system. All facilities are within the Coastal Plain Province and the Central Lowlands Province (see table 4.1.1-1). The Coastal Plain Province is characterized by Cretaceous to Holocene-age sedimentary bedrock (Frazier, 2007). Topography in the area of the Trunkline Project consists of a terraced landscape that either leads to or is found along creeks and rivers (William and Mary, 2011).

4.1.1.3 Contractor Yards and Access Roads

The access roads and contractor yards are in the same general vicinity as the Rover pipelines, and geologic conditions would not vary significantly. The Panhandle and Trunkline Projects would site their contractor yards within the fence lines of the existing compressor stations to be modified and in areas that have been previously disturbed, therefore geologic conditions would not vary. No new or temporary access roads would be created for the Panhandle and Trunkline Projects.

4.1.1.4 Geotechnical Investigations for Horizontal Directional Drill Crossings

Rover conducted geotechnical investigations to evaluate subsurface conditions at the proposed HDD crossing sites. The purpose of these investigations is to confirm the geology in the immediate area to help determine the feasibility of using either an HDD or other trenchless crossing method. Rover is currently proposing to cross 30 locations using the HDD method. All geotechnical investigations are complete and were submitted to the Commission in July 2015 and March 2016. Table 4.1.1-3 summarizes the location of the geotechnical investigations for each of the proposed HDD crossing locations.

As previously discussed, the Panhandle and Trunkline Projects would not include a pipeline component and would therefore not require trenchless crossings.

TABLE 4.1.1-3

Summary of Geotechnical Investigations for the Horizontal Directional Drill Method Along the Rover Pipeline Project

Pipeline Segment	Feature Avoided	Start MP	Crossing Distance (feet)	Status of Geotechnical Investigations
Sherwood Lateral	Highway 50	1.0	2,502	Complete
	Middle Island Creek	13.0	1,907	Complete
	Middle Island Creek	23.7	2,953	Complete
	Ohio River	33.8	6,370	Complete
CGT Lateral	N/A	--	--	N/A
Seneca Lateral	N/A	--	--	N/A
Berne Lateral	N/A	--	--	N/A
Clarington Lateral	Captina Creek	6.0	1,854	Complete
Clarington Lateral	Interstate 70	18.9	2,394	Complete
Majorsville Lateral	Ohio River	11.9	2,803	Complete
Cadiz Lateral	N/A	--	--	N/A
Supply Connector Lines A and B	Highway 151	16.8	1,340	Complete
Burgettstown Lateral	Ohio River	16.8	7,124	Complete
Mainlines A and B	Indian Fork	25.6	4,097	Complete
Mainlines A and B	Sandy Creek	35.7	1,340	Complete
	Interstate 77	39.6	1,649	Complete
	Tuscarawas River	41.9	4,616	Complete
	Tributaries (2) - North Fork Sugar Creek	53.5	1,640	Complete
	Prairie Lane	68.3	2,129	Complete
	Norfolk Southern Railroad	69.2	1,787	Complete
	State Highway 3 (Columbus Road)	71.9	1,761	Complete
	U.S. Highway 30 (West Lincoln Way)	77.0	1,650	Complete
	Interstate 71	91.7	1,343	Complete
	U.S. Highway 42 / Railroad	94.6	1,349	Complete
	Black Fork Mohican River	95.9	1,995	Complete
	County Route 12 / Honey Creek	135.3	1,847	Complete
	Honey Creek	140.6	1,340	Complete
	Sandusky River	142.4	1,640	Complete
	Interstate 75	170.2	3,485	Complete

TABLE 4.1.1-3 (continued)				
Summary of Geotechnical Investigations for the Horizontal Directional Drill Method Along the Rover Pipeline Project				
Pipeline Segment	**Feature Avoided**	**Start MP**	**Crossing Distance (feet)**	**Status of Geotechnical Investigations**
	State Route 109 / S. Fork Turkeyfoot Creek	190.3	2,616	Complete
	Maumee River	200.7	2,380	Complete
Market Segment	State Route 52 (Austin Road)	62.2	3,091	Complete
	Interstate 94	74.7EQ	2,144	Complete
	Portage River	84.5EQ	2,070	Complete

N/A = Not applicable. No HDDs have been proposed for these segments.

Source: Terracon, 2015b

Note: At the time of the issuance of the draft EIS, not all geotechnical investigations were complete. As of the issuance of this final EIS, all geotechnical investigations have been completed and the results submitted to the FERC.

4.1.2 Mineral Resources

Mineral resources identified within 0.25 mile of the Rover Project include active, inactive, and permitted (but not yet constructed) oil and gas wells. Mineral resources also include both underground and surface mining operations including coal, sand, gravel, clay, flagstone, and halite mines (USGS, 2014b). Information regarding mineral resources in proximity to the Rover Project facilities was obtained through the Pennsylvania Spatial Data Access (PASDA) geographic information system (GIS) data layer for Industrial Mineral Mining Operations (PASDA, 2015a), the Ohio Department of Natural Resources (OHDNR, 2015a), the West Virginia Geological Survey Interactive Data Tool (WVGS, 2015), and the USGS Mineral Resource Data System (USGS, 2014b).

Mineral resources within 0.25 mile of the Panhandle and Trunkline Projects vary by region. These resources would not be impacted, because all activities related to these Projects would take place at existing facilities within areas that have been previously disturbed, and are not discussed further in this section.

4.1.2.1 Mining

There are 117 known mining operations within 0.25 mile of the Rover Project, consisting mainly of coal, sand, gravel, and limestone mines (see table 4.1.2-1). Of these mines, 51 active mining operations and 54 inactive sites would be crossed by the Rover Project rights-of-way. In addition to mapped mines, unmapped abandoned mines could be present along the Rover Project route. Section 4.1.3.6 provides additional information on unmapped historic mines and the associated potential hazards.

TABLE 4.1.2-1

Mines Located Within 0.25 Mile of the Rover Pipeline Project

Project Component	Start MP	End MP	Distance Affected <u>a</u> (miles)	Distance from Project <u>b</u> (feet)	Name <u>c</u>	Type	Resource	Status
Sherwood Lateral **<u>d</u>**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CGT Lateral **<u>d</u>**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Seneca Lateral	21.6	21.8	0.3	0.0	North American Coal Corporation	Underground	Coal	Inactive
Seneca Lateral	23.6	25.6	2.1	0.0	North American Coal Corporation	Underground	Coal	Inactive
Seneca Lateral	23.7	23.8	0.0	0.0	Quarto Mining Company	Surface	Coal	Active
Seneca Lateral	23.8	23.8	0.0	0.0	Quarto Mining Company	Surface	Coal	Active
Seneca Lateral	1.2	1.2	0.0	1,003.8	Christman Quarry	Surface	Limestone	Inactive
Clarington Lateral	0.0	4.1	4.1	0.0	North American Coal Corporation	Underground	Coal	Inactive
Clarington Lateral	4.1	5.8	1.8	0.0	Unknown	Underground	Coal	Active
Clarington Lateral	5.1	6.2	1.0	1,058.9	Cravat Coal Company	Surface	Coal	Active
Clarington Lateral	6.3	6.4	0.1	1,025.9	Belmont Coal Incorporated	Surface	Coal	Active
Clarington Lateral	6.6	6.8	0.1	0.0	Captina Coal Company	Underground	Coal	Inactive
Clarington Lateral	6.9	7.1	0.2	0.0	Crow Oil & Gas Company	Underground	Coal	Inactive
Clarington Lateral	7.6	8.1	0.5	0.0	North American Coal Company	Underground	Coal	Inactive
Clarington Lateral	8.7	14.3	5.6	0.0	Unknown	Underground	Coal	Active
Clarington Lateral	14.4	15.2	0.8	0.0	Y & O Coal Company	Underground	Coal	Inactive
Clarington Lateral	15.4	15.5	0.1	1,020.9	Marietta Coal Company	Surface	Coal	Active
Clarington Lateral	16.0	16.7	0.6	0.0	R & F Coal Company	Surface	Coal	Active
Clarington Lateral	16.0	18.1	2.1	0.0	Unknown	Underground	Coal	Active

TABLE 4.1.2-1 (continued)

Mines Located Within 0.25 Mile of the Rover Pipeline Project

Project Component	Start MP	End MP	Distance Affected a (miles)	Distance from Project b (feet)	Name c	Type	Resource	Status
Clarington Lateral	17.0	17.0	0.0	0.0	R & F Coal Company	Surface	Coal	Active
Clarington Lateral	17.1	17.1	0.0	0.0	R & F Coal Company	Surface	Coal	Active
Clarington Lateral	18.1	18.8	0.7	0.0	Saginaw Mining Company	Underground	Coal	Inactive
Clarington Lateral	19.8	19.8	0.1	0.0	R & F Coal Company	Surface	Coal	Active
Clarington Lateral	19.8	19.8	0.0	0.0	R & F Coal Company	Surface	Coal	Active
Clarington Lateral	20.3	20.3	0.0	0.0	Progress Coal Company	Underground	Coal	Inactive
Clarington Lateral	20.5	20.9	0.4	0.0	R & F Coal Company	Surface	Coal	Active
Clarington Lateral	20.5	20.8	0.3	0.0	Progress Coal Company	Underground	Coal	Inactive
Clarington Lateral	20.9	20.9	0.0	0.0	R & F Coal Company	Surface	Coal	Active
Clarington Lateral	21.3	21.4	0.0	0.0	Elm Grove Mining Company	Underground	Coal	Inactive
Clarington Lateral	21.8	22.5	0.6	1,189.2	Bannock Coal Company	Surface	Coal	Active
Clarington Lateral	22.1	22.2	0.1	0.0	R & F Coal Company	Surface	Coal	Active
Clarington Lateral	22.2	22.2	0.0	0.0	Elm Grove Mining Company	Underground	Coal	Inactive
Clarington Lateral	22.2	25.7	3.4	1,201.4	The Ohio River Collieries Company	Surface	Coal	Active
Clarington Lateral	22.4	22.6	0.1	0.0	Warner Collieries	Underground	Coal	Inactive
Clarington Lateral	22.6	22.6	0.0	1,206.4	Bannock Coal Company	Surface	Coal	Active
Clarington Lateral	22.7	22.9	0.2	0.0	Monaco Coal Mining Company	Underground	Coal	Inactive
Clarington Lateral	23.2	23.5	0.3	0.0	Monaco Coal Mining Company	Underground	Coal	Inactive
Clarington Lateral	24.3	25.5	1.2	0.0	Consolidation Coal Company	Underground	Coal	Inactive
Clarington Lateral	26.1	26.2	0.1	0.0	Consolidation Coal Company	Underground	Coal	Inactive

TABLE 4.1.2-1 (continued)

Mines Located Within 0.25 Mile of the Rover Pipeline Project

Project Component	Start MP	End MP	Distance Affected a (miles)	Distance from Project b (feet)	Name c	Type	Resource	Status
Clarington Lateral	26.2	26.3	0.1	0.0	Consolidation Coal Company	Underground	Coal	Inactive
Clarington Lateral	26.3	27.6	1.4	0.0	Consolidation Coal Company	Underground	Coal	Inactive
Clarington Lateral	26.3	27.3	0.9	0.0	Consolidation Coal Company	Surface	Coal	Active
Clarington Lateral	27.4	27.5	0.2	0.0	Consolidation Coal Company	Surface	Coal	Active
Clarington Lateral	27.7	27.8	0.1	0.0	Consolidation Coal Company	Surface	Coal	Active
Clarington Lateral	28.1	28.2	0.2	0.0	R & F Coal Company	Surface	Coal	Active
Clarington Lateral	28.2	28.3	0.0	917.3	Consolidation Coal Company	Surface	Coal	Active
Clarington Lateral	28.3	28.3	0.0	0.0	Consolidation Coal Company	Surface	Coal	Active
Clarington Lateral	29.3	29.9	0.6	0.0	Consolidation Coal Company	Surface	Coal	Active
Clarington Lateral	30.1	30.4	0.3	0.0	Consolidation Coal Company	Surface	Coal	Active
Clarington Lateral	30.7	30.7	0.0	0.0	Ensurco Associates Incorporated	Surface	Limestone	Active
Clarington Lateral	30.8	30.9	0.0	0.0	Ensurco Associates Incorporated	Surface	Limestone	Active
Majorsville Lateral	0.6	2.0	1.5	0.0	Consol Energy	Underground	Unknown	Active
Majorsville Lateral	5.3	7.0	1.6	0.0	Consol Energy	Underground	Unknown	Active
Majorsville Lateral	7.1	7.7	0.5	0.0	Consol Energy	Underground	Unknown	Active
Majorsville Lateral	8.2	8.4	0.2	0.0	Hitchman Coal & Coke Company	Underground	Coal	Active
Majorsville Lateral	8.6	8.7	0.1	0.0	Hitchman Coal & Coke Company	Underground	Coal	Active
Majorsville Lateral	9.5	9.7	0.2	0.0	Hitchman Coal & Coke Company	Underground	Coal	Active
Majorsville Lateral	9.8	9.8	0.0	0.0	Hitchman Coal & Coke Company	Underground	Coal	Active

TABLE 4.1.2-1 (continued)

Mines Located Within 0.25 Mile of the Rover Pipeline Project

Project Component	Start MP	End MP	Distance Affected a (miles)	Distance from Project b (feet)	Name c	Type	Resource	Status
Majorsville Lateral	10.0	10.1	0.1	0.0	Hitchman Coal & Coke Company	Underground	Coal	Active
Majorsville Lateral	10.2	10.9	0.7	0.0	Hitchman Coal & Coke Company	Underground	Coal	Active
Majorsville Lateral	11.1	11.2	0.0	0.0	Hitchman Coal & Coke Company	Underground	Coal	Active
Majorsville Lateral	12.4	14.1	1.6	0.0	Cambria Colleries Company	Underground	Coal	Inactive
Majorsville Lateral	14.1	14.4	0.3	0.0	Rail & River Coal Company	Underground	Coal	Inactive
Majorsville Lateral	14.4	16.1	1.7	0.0	Rail & River Coal Company	Underground	Coal	Inactive
Majorsville Lateral	15.2	17.2	2.0	0.0	Rail & River Coal Company	Underground	Coal	Inactive
Majorsville Lateral	17.2	17.6	0.4	0.0	Cambria Mining Company	Underground	Coal	Inactive
Majorsville Lateral	17.6	19.4	1.7	0.0	North American Coal Company	Underground	Coal	Inactive
Majorsville Lateral	19.4	19.6	0.2	0.0	North American Coal Company	Underground	Coal	Inactive
Majorsville Lateral	19.6	20.3	0.7	0.0	North American Coal Company	Underground	Coal	Inactive
Majorsville Lateral	20.9	22.2	1.3	0.0	North American Coal Company	Underground	Coal	Inactive
Majorsville Lateral	22.3	23.2	0.9	0.0	Unknown	Underground	Coal	Active
Majorsville Lateral	22.4	22.6	0.1	0.0	Cravat Coal Company	Surface	Coal	Active
Majorsville Lateral	23.3	23.6	0.3	0.0	Unknown	Underground	Coal	Active
Cadiz Lateral	0.0	0.9	0.9	0.0	Consolidation Coal Company	Surface	Coal	Active
Burgettstown Lateral	0.0	0.4	0.4	0.0	Unknown	Underground	Coal	Inactive

TABLE 4.1.2-1 (continued)

Mines Located Within 0.25 Mile of the Rover Pipeline Project

Project Component	Start MP	End MP	Distance Affected a (miles)	Distance from Project b (feet)	Name c	Type	Resource	Status
Burgettstown Lateral	2.1	2.3	0.3	0.0	Unknown	Underground	Coal	Inactive
Burgettstown Lateral	15.5	15.5	0.0	0.0	Unknown	Surface	Coal	Active
Burgettstown Lateral	16.3	16.6	0.3	0.0	Kaul Clay Company	Underground	Clay	Inactive
Burgettstown Lateral	16.4	16.5	0.1	0.0	Kaul-Oberkirch Company	Underground	Coal	Inactive
Burgettstown Lateral	16.8	16.9	0.0	0.0	Kaul Clay Company	Underground	Clay	Inactive
Burgettstown Lateral	16.9	17.0	0.1	0.0	Kaul Clay Company	Underground	Clay	Inactive
Burgettstown Lateral	16.9	17.0	0.0	0.0	Rutledge Brothers	Underground	Coal	Inactive
Burgettstown Lateral	17.0	17.0	0.0	0.0	Morelli Coal Company	Underground	Coal	Inactive
Burgettstown Lateral	17.0	17.1	0.1	0.0	Kaul Clay Company	Underground	Clay	Inactive
Burgettstown Lateral	17.1	17.1	0.0	0.0	Rutledge Brothers	Underground	Coal	Inactive
Burgettstown Lateral	20.2	20.3	0.1	0.0	S & D Construction Corporation	Surface	Coal	Active
Burgettstown Lateral	25.5	25.7	0.2	1,035.3	The Ohio River Collieries Company	Surface	Coal	Active
Burgettstown Lateral	29.4	29.8	0.4	0.0	North American Coal Company	Underground	Coal	Inactive
Burgettstown Lateral	34.3	34.4	0.1	0.0	Y & O Coal Company	Underground	Coal	Inactive
Burgettstown Lateral	34.4	34.5	0.0	0.0	Y & O Coal Company	Underground	Coal	Inactive
Burgettstown Lateral	34.9	35.6	0.6	0.0	Y & O Coal Company	Underground	Coal	Inactive
Burgettstown Lateral	35.6	35.6	0.0	0.0	Y & O Coal Company	Underground	Coal	Inactive
Burgettstown Lateral	35.6	35.7	0.0	0.0	Y & O Coal Company	Underground	Coal	Inactive
Burgettstown Lateral	35.7	35.8	0.1	0.0	Y & O Coal Company	Underground	Coal	Inactive
Burgettstown Lateral	35.8	36.0	0.1	0.0	Y & O Coal Company	Underground	Coal	Inactive
Burgettstown Lateral	49.6	50.1	0.4	0.0	Unknown	Underground	Coal	Active

TABLE 4.1.2-1 (continued)

Mines Located Within 0.25 Mile of the Rover Pipeline Project

Project Component	Start MP	End MP	Distance Affected a (miles)	Distance from Project b (feet)	Name c	Type	Resource	Status
Burgettstown Lateral	50.2	50.8	0.7	0.0	Unknown	Underground	Coal	Active
Mainlines A and B	2.2	3.1	1.0	0.0	R & F Coal Company	Surface	Coal	Active
Mainlines A and B	3.2	3.4	0.2	0.0	R & F Coal Company	Surface	Coal	Active
Mainlines A and B	15.4	18.2	2.9	0.0	Unknown	Underground	Coal	Active
Mainlines A and B	16.1	16.4	0.2	0.0	Puskarich Mining Incorporated	Surface	Coal	Active
Mainlines A and B	18.4	18.5	0.1	0.0	Muskingum Coal Company	Underground	Coal	Inactive
Mainlines A and B	19.4	19.9	0.6	0.0	Unknown	Underground	Unknown	Active
Mainlines A and B	20.2	21.5	1.3	0.0	Unknown	Underground	Unknown	Active
Mainlines A and B	21.7	22.2	0.5	0.0	Somers Mining Company	Underground	Coal	Inactive
Mainlines A and B	25.5	25.8	0.3	0.0	Puskarich Mining Incorporated	Surface	Limestone	Active
Mainlines A and B	25.9	25.9	0.5	0.0	Puskarich Mining Incorporated	Surface	Limestone	Active
Mainlines A and B	26.0	26.1	0.0	0.0	Puskarich Mining Incorporated	Surface	Limestone	Active
Mainlines A and B	30.3	30.7	0.6	0.0	Red Malcut Incorporated	Surface	Coal	Active
Mainlines A and B	30.8	31.4	0.6	0.0	Red Malcut Incorporated	Surface	Coal	Active
Mainlines A and B	31.0	31.1	0.1	0.0	Markley, George J.	Underground	Coal	Inactive
Mainlines A and B	31.2	31.8	0.5	0.0	Federal Clay Products Company	Underground	Clay, Coal	Inactive
Mainlines A and B	32.1	32.1	0.0	0.0	Strong, W.G.	Underground	Coal	Inactive
Mainlines A and B	32.2	32.7	0.5	0.0	Miller Mining Incorporated	Surface	Coal	Inactive
Mainlines A and B	32.2	32.3	0.5	782.0	Strong, W.G.	Underground	Coal	Inactive
Mainlines A and B	38.8	38.9	0.0	0.0	Countywide Landfill Incorporated	Surface	Coal	Inactive

TABLE 4.1.2-1 (continued)								
Mines Located Within 0.25 Mile of the Rover Pipeline Project								
Project Component	**Start MP**	**End MP**	**Distance Affected a (miles)**	**Distance from Project b (feet)**	**Name c**	**Type**	**Resource**	**Status**
Mainlines A and B	39.3	39.3	0.0	835.7	Countywide Landfill Incorporated	Surface	Coal	Inactive
Mainlines A and B	46.1	46.1	0.0	0.0	Wilmot Mining Company	Surface	Coal	Inactive
Mainlines A and B	51.9	52.8	0.9	1,047.9	Mullet Coal Company	Surface	Coal	Active
Market Segment d	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

a Mathematical discrepancies are due to rounding.
b A distance of 0.0 mile indicates that the mining operation would be crossed by the Rover Project.
c Unknown mines located in proximity to one another could be the same mine crossed at different locations. For the purposes of this report, unknown mines are individually identified.
d No mines were identified within 0.25 mile of the specified Project component.
Sources: OHDNR, 2015a; PASDA, 2015a; USGS, 2014b; WVGS, 2015

4.1.2.2 Oil and Gas Production

A total of 863 active and 22 inactive oil and gas wells were identified within 0.25 mile of the Rover Project. An additional eight wells with an unknown status are also within 0.25 mile of the Rover Project. Table 4.1.2-2 summarizes wells in the Rover Project area by status and nearest Project component. Appendix J provides a complete list of all 893 wells within 0.25 mile of the Rover Project along with their location relative to the Project area, well type (i.e., oil or gas), and status. Of the active wells within 0.25 mile of the Rover Project, the closest would be 2.2 feet from the Burgettstown Lateral at MP BGL 4.0. Several of these wells would be within 100 feet of the Rover Project. One active natural gas storage facility was identified within 0.3 mile of the CGT Lateral route at MP CGT 5.7 (EIA, 2008), and the OHDNR (2015a) database identified three gas storage wells along Mainlines A and B near MP MAB 74.4. The closest of these gas storage wells would be 68.6 feet from the Rover Project.

Unmapped oil and gas wells could also be present along the Rover Project route. Section 4.1.5 identifies measures that Rover would implement when working near active oil and gas wells and in the event a previously unknown well is encountered during construction.

TABLE 4.1.2-2 **Summary of Oil and Gas Wells within 0.25 Mile of the Rover Pipeline Project**				
Component	**Active Wells**	**Inactive Wells**	**Unknown**	**Total**
Berne Lateral	9	1	0	10
Burgettstown Lateral	89	2	0	92
Cadiz Lateral	1	0	0	1
CGT Lateral	45	3	3	51
Clarington Lateral	26	0	0	26
Mainlines A and B	257	3	3	263
Majorsville Lateral	38	0	0	38
Market Segment	9	12	0	21
Seneca Lateral	69	0	0	69
Sherwood Lateral	268	1	2	271
Supply Connector	52	0	0	52
Total	**863**	**22**	**8**	**893**
Sources: OHDNR, 2015a; PASDA, 2015a; USGS, 2014b; WVGS, 2015				

4.1.3 Geologic Hazards

Geologic hazards including seismicity (e.g., earthquakes), surface faults, soil liquefaction, landslides, flash flooding, ground subsidence due to karst topography and mining activities, shallow bedrock, and blasting were evaluated for the Projects. These hazards are discussed in the sections that follow. Conditions necessary for the development of other geologic hazards, including avalanches and volcanism, are not present in the vicinity of the Projects and are therefore not discussed below.

4.1.3.1 Seismicity

The majority of significant earthquakes around the world are associated with tectonic subduction zones, where one crustal plate is overriding another (e.g., the Japanese islands), where tectonic plates are sliding past each other (e.g., California), or where tectonic plates are converging (e.g., the Indian Sub-Continent). Unlike these highly active tectonic regions, the Projects' area are not located in proximity to any tectonic plate boundaries and are relatively seismically quiet except for several fault zones described below. Earthquakes, however, do occur in the area of the Projects, largely due to trailing edge tectonics and residual stress release from past orogenic (i.e., mountain building) events.

The shaking during an earthquake can be expressed in terms of the acceleration due to gravity. Based on USGS seismic hazard mapping, the Rover Project facilities are in areas where the maximum peak horizontal ground accelerations of 4 to 10 percent of the force of gravity (g) have a 2 percent chance of being exceeded in 50 years. Peak horizontal ground accelerations between 2 and 4 percent g have a 10 percent chance of being exceeded in 50 years (Petersen et al., 2014). Peak ground accelerations less than 10 percent g are considered as having little to no potential for damage. In general, modern electric arc-welded steel pipelines have not sustained damage during seismic events except due to either permanent ground deformation or traveling ground-wave propagation greater than or equal to a Modified Mercalli Intensity of VIII (O'Rourke and Palmer, 1994a).

The State of Ohio Hazard Mitigation Plan identifies two seismically active areas (see figure 4.1.3-1). These zones, both of which are located more than 60 miles from the Rover Project area, are in the areas of Lake County and Shelby County and are characterized by poorly known faults that are deeply buried. The faults in these areas developed about 1 billion years ago during mountain building events (OHEMA, 2011). No areas of high incidence of earthquakes were identified within Pennsylvania, West Virginia, or Michigan. Table 4.1.3-1 identifies historic earthquakes that have occurred nearest to the Rover Project area since 1776. The largest magnitude earthquake was a 5.4, which occurred in 1937. Since 1776, 64 earthquakes have occurred in the Rover Project area, the closest of which occurred about 30 miles from the proposed Rover Project (USGS, 2015a).

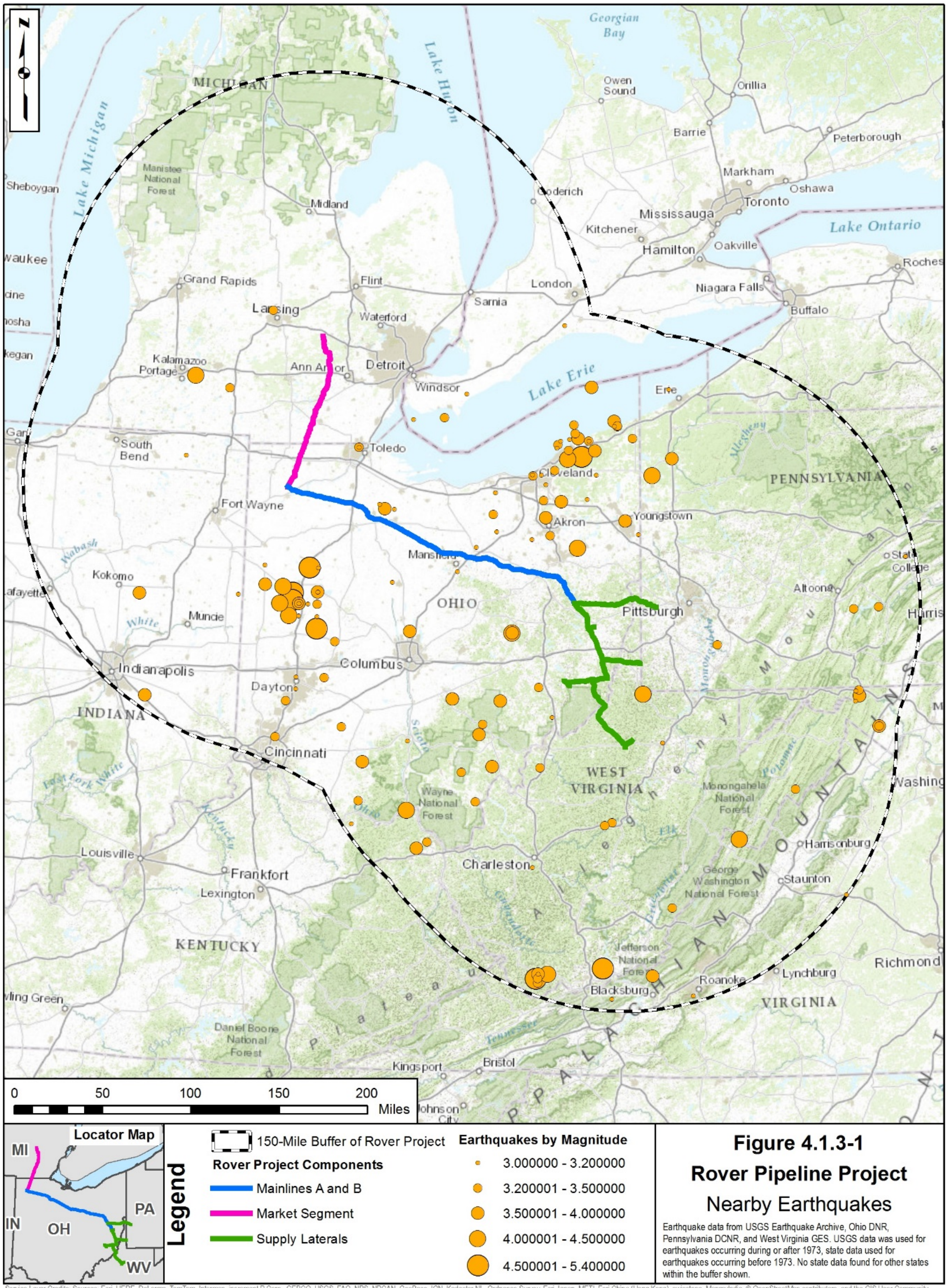
Seismicity in the area of the Panhandle Project is relatively low with the estimated peak ground accelerations of 1 percent g or an earthquake with a 10 percent chance of being exceeded within 50 years (i.e., a 500-year earthquake). Since 1900, three earthquakes, all with a magnitude of less than 5.0 have occurred in the vicinity of the Panhandle Project area. The earthquakes included a 2.6 magnitude earthquake 5.8 miles away in 2015, a 3.6 magnitude earthquake 3.3 miles away in 2000, and a 3.2 magnitude earthquake 9.9 miles away in 1990.

Seismicity within the majority of the Trunkline Project area can be characterized as relatively low with ground accelerations for an earthquake with a 10 percent probability of occurring within 50 years of less than 10 percent g. However, parts of the Trunkline Project located in southern Illinois and western Tennessee are in proximity to the New Madrid fault, and ground accelerations on the order of 25 to 30 percent have been estimated for a 500-year earthquake in this area.

The Panhandle and Trunkline Projects do not require the construction of new facilities that could potentially be affected by earthquake activity, therefore we do not consider impacts associated with seismicity to these Projects to be a concern.

4.1.3.2 Faults

Faulting due to tectonic events over geologic time scale is not known to occur along the Rover pipeline route, but small seismic events have been recorded. For a fault to be considered active, displacement must have taken place during the Holocene Epoch within the last 10,000 years (USGS, 2006). The Bowling Green Thrust Fault located near MP MAB 170.0 is the only mapped fault that would be crossed by the Projects. The exact age of the Bowling Green fault is unknown. A scientific publication by the Ohio Geological Society (OHGS, 1995) states that the fault formed most likely during the late Cretaceous Period. However, it is possible that this fault is younger but due to undisturbed glacial sediments not younger than the Pleistocene. A Quaternary fault is an active fault that has been recognized at the surface and has evidence of movement in the past 1.6 million years. A review of the USGS Quaternary Fault and Fold Database of the United States did not identify any active Holocene-age faults in the vicinity of either the Rover or Panhandle Project facilities. Portions of the Trunkline Project (i.e., the Dyersburg and Joppa Compressor Stations) would be in proximity to the New Madrid seismic zone at a distance of about 47 and 60 miles, respectively (USGS, 2006).



Locator Map
MI
IN
OH
PA
WV
Legend
150-Mile Buffer of Rover Project
Rover Project Components
Mainlines A and B
Market Segment
Supply Laterals
Earthquakes by Magnitude
3.000000 - 3.200000
3.200001 - 3.500000
3.500001 - 4.000000
4.000001 - 4.500000
4.500001 - 5.400000
0 50 100 150 200 Miles
Figure 4.1.3-1
Rover Pipeline Project
Nearby Earthquakes
Earthquake data from USGS Earthquake Archive, Ohio DNR, Pennsylvania DCNR, and West Virginia GES. USGS data was used for earthquakes occurring during or after 1973, state data used for earthquakes occurring before 1973. No state data found for other states within the buffer shown.
Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

TABLE 4.1.3-1

Earthquake Magnitude 3.5 and Greater Occurrence in Proximity to the Rover Pipeline Project

Distance From Project (miles)	Magnitude	Year	Closest Project Component	Source
5.4	4.1	1824	Majorsville Lateral	WVGES
25.2	4.4	1853	CGT Lateral	WVGES
42.8	3.6	1909	Majorsville Lateral	WVGES
38.4	3.6	1963	Burgettstown Lateral	WVGES
41.5	4.5	1964	Sherwood Lateral	WVGES
43.5	3.5	1965	Sherwood Lateral	WVGES
42.8	3.5	1967	Sherwood Lateral	WVGES
38.4	4.6	1969	Sherwood Lateral	WVGES
42.0	3.7	1972	Sherwood Lateral	WVGES
10.9	4.0	1776	Mainline A	Ohio DNR
10.9	4.5	1779	Mainline A	Ohio DNR
34.8	3.5	1834	Mainline A	Ohio DNR
22.2	3.5	1843	Mainline A	Ohio DNR
19.6	3.7	1848	Berne Lateral	Ohio DNR
34.7	3.5	1854	Mainline A	Ohio DNR
14.6	3.8	1873	Mainline A	Ohio DNR
21.3	4.7	1875	Mainline A	Ohio DNR
12.3	4.8	1884	Mainline A	Ohio DNR
9.6	3.8	1885	Mainline B	Ohio DNR
17.4	3.8	1886	Berne Lateral	Ohio DNR
16.9	3.8	1892	Mainline A	Ohio DNR
35.2	4.3	1901	Berne Lateral	Ohio DNR
19.3	3.6	1926	Berne Lateral	Ohio DNR
18.8	3.7	1929	Mainline A	Ohio DNR
21.2	4.2	1930	Mainline A	Ohio DNR
18.4	4.7	1931	Mainline A	Ohio DNR
17.2	4.9	1937	Mainline A	Ohio DNR
17.6	5.4	1937	Mainline A	Ohio DNR
20.3	4.4	1943	Mainline B	Ohio DNR
19.4	4.1	1944	Mainline A	Ohio DNR
11.6	3.9	1952	Berne Lateral	Ohio DNR
9.0	3.5	1955	Market Segment	Ohio DNR
15.7	3.7	1956	Mainline A	Ohio DNR
18.8	3.7	1957	Mainline A	Ohio DNR
2.0	3.7	1967	Mainline B	Ohio DNR
19.6	3.7	1967	Berne Lateral	Ohio DNR
5.4	4.1	1824	Majorsville Lateral	PA DCNR
42.8	3.5	1909	Majorsville Lateral	PA DCNR

TABLE 4.1.3-1 (continued)

Earthquake Magnitude 3.5 and Greater Occurrence in Proximity to the Rover Pipeline Project

Distance From Project (miles)	Magnitude	Year	Closest Project Component	Source
24.8	3.7	1852	Burgettstown Lateral	PA DCNR
38.4	3.6	1963	Burgettstown Lateral	PA DCNR
6.0	4.2	1927	Mainline B	PA DCNR
33.2	3.9	1857	Mainline B	PA DCNR
21.5	4.2	2015	Market Segment	USGS
16.0	3.5	2013	Berne Lateral	USGS
13.4	3.7	2011	Burgettstown Lateral	USGS
31.5	3.8	2010	Mainline A	USGS
12.9	3.7	2007	Mainline B	USGS
24.8	3.5	2006	Mainline B	USGS
43.6	3.8	2004	Mainline A	USGS
24.1	3.6	2003	Mainline B	USGS
28.6	3.9	2001	Mainline B	USGS
21.3	4.5	1998	Burgettstown Lateral	USGS
37.6	3.6	1995	Berne Lateral	USGS
9.7	3.5	1994	Market Segment	USGS
22.6	3.6	1993	Mainline B	USGS
26.2	3.5	1992	Mainline B	USGS
29.0	3.5	1991	Sherwood Lateral	USGS
27.9	3.5	1987	Mainline B	USGS
16.4	4.5	1986	Mainline A	USGS
21.1	5.0	1986	Mainline B	USGS
36.5	3.5	1983	Berne Lateral	USGS
38.5	3.6	1979	Berne Lateral	USGS
42.9	4.7	1976	Sherwood Lateral	USGS
39.9	3.6	1974	Sherwood Lateral	USGS

Sources: WVGS, 2014; OHDGS, 2015; Faill, 2003; USGS, 2015a

4.1.3.3 Soil Liquefaction

Soil liquefaction is a phenomenon often associated with seismic activity in which saturated, non-cohesive soils temporarily lose their strength and liquefy (i.e., behave like viscous liquid) when subjected to forces such as intense and prolonged ground shaking. Areas susceptible to liquefaction may include soils that are generally sandy or silty and are mostly located along rivers, streams, lakes, and shorelines or in areas with shallow groundwater (University of Washington, 2000). Due to the low potential for seismicity in the Project areas, hazards from soil liquefaction are not anticipated.

4.1.3.4 Landslides

Landslides are defined as the movement of rock, debris, or soil down a slope. Slope failure causing a landslide can be initiated by precipitation, seismic activity, slope disturbance due to construction or other activity, or a change in groundwater conditions, such as a seasonal high groundwater table. Construction factors that may increase the potential for slope failure could include trenching along slopes and the burden of construction equipment on unstable surfaces.

Information on landslide incidence and susceptibility was obtained through a review of the digitally compiled Landslide Overview Map of the Conterminous United States (USGS, 1997). Several locations near the Projects were identified as being susceptible to landslides. Red beds, areas made up of red mudstone, can become weakened when wet and could potentially produce landslides. Red beds have been identified in the Dunkard, Monongahela, and Conemaugh bedrock groups in Pennsylvania, West Virginia, and eastern Ohio. About 224 miles along the Rover pipelines have been identified as having a high susceptibility to landslides. Table 4.1.3-2 provides landslide susceptibility and incidence for the Rover Project.

One component of the Panhandle Project, the Panhandle-Rover Interconnect, was identified as having moderate susceptibility to landslides with a low incidence of landslide events. All other facilities associated with the Panhandle and Trunkline Projects have a low susceptibility to landslides with low incidence rate.

Landslides are associated with steep slopes. About 99 miles of the Rover pipeline routes would be constructed in areas where the average slopes are between 15 and 30 percent, and about 69 miles of the pipeline routes have average slopes greater than 30 percent. Table 4.1.3-3 provides areas of steep slopes that would be crossed by the Rover Project. Construction and operation of the Panhandle and Trunkline Projects would occur at previously graded, existing facility sites. Therefore, hazards due to steep slopes are not anticipated for these Projects.

Rover performed an analysis of the expected geologic conditions and hazards along the proposed pipeline routes. The analysis was limited to a desktop review of publicly available information including state-specific soils, bedrock, elevations, landslide susceptibility, and mining location data layers provided by the USGS, OHDNR, PADCNR, WVGES, and the Michigan Department of Technology, Management, and Budget GIS Open Data Portal. These sources were used to determine areas prone to potential hazards from landslides, underground mines, and surface mines (Terracon, 2015a). Rover conducted a geo-hazard evaluation of landslide and mine subsidence hazards that may be present along the Rover Project. As part of the evaluation, a landslide hazard model was developed to rank areas along the Rover Project according to the areas' susceptibility to land sliding. The landslide hazard model considers the aerial photography, physiographic setting, bedrock geology, surficial geology, slopes, steam hydrology, and terrain in determining the potential for land sliding along the Rover Project. Table 4.1.3-4 presents a summary of the landslide hazard susceptibility scores along the Rover Project.

TABLE 4.1.3-2

Landslide Hazards in the Rover Pipeline Project Area

Facility	Start MP	End MP	Crossing Distance (miles) a	Landslide Susceptibility	Landslide Incidence b
SUPPLY LATERALS					
Sherwood Lateral	0.0	53.0	53.0	High	Moderate
CGT Lateral	0.0	5.7	5.7	High	Moderate
Seneca Lateral	0.0	2.8	2.8	High	No data
	2.8	25.6	22.9	High	Moderate
Berne Lateral	0.0	0.3	0.3	High	Moderate
	0.3	3.7	3.4	High	No data
Clarington Lateral	0.0	19.0	19.0	High	Moderate
	19.0	32.6	13.6	High	No data
Majorsville Lateral	0.0	23.6	23.6	High	Moderate
Cadiz Lateral	0.0	2.9	2.9	High	No data
Burgettstown Lateral	0.0	15.9	15.9	High	Moderate
	15.9	42.3	26.5	High	No data
	42.3	51.3	9.0	High	Low
Supply Connector Lines A and B	0.0	9.3	9.3	High	No data
	9.3	18.9	9.6	High	Low
MAINLINES					
Mainlines A and B	18.9	25.5	6.6	High	Low
	25.5	110.3	84.9	N/A	Low
	110.3	119.8	9.5	N/A	Moderate
	119.8	205.5	85.7	N/A	Low
	205.5	209.4	3.9	N/A	Moderate
MARKET					
Market Segment	0.0	6.6	6.6	N/A	Moderate
	6.6	101.2	94.6	N/A	Low

a Mathematical discrepancies are due to rounding.
b No data - information was not provided.
N/A = Information is not available
Source: USGS, 1997

TABLE 4.1.3-3

Summary of Steep Slopes Crossed by the Rover Pipeline Project

Project Component	Crossing Distance (miles) ASR 15 - 30%	Crossing Distance (miles) ASR > 30%
Berne Lateral	0.9	2.5
Sherwood Lateral	24.1	16.2
Burgettstown Lateral	15.9	10.4
Cadiz Lateral	0.4	0.8
CGT Lateral	4.0	0.9
Clarington Lateral	10.7	9.0
Majorsville Lateral	6.6	11.9
Seneca Lateral	14.7	6.2
Supply Connector Lines A and B	7.3	5.6
Mainlines A and B	9.5	4.8
Market Segment	4.8	0.5
Total	**99.0**	**68.7**

ASR = average slope range

Sources: USGS, 2007a, 2007b, 2008

TABLE 4.1.3-4

Landslide Hazard Model Scores Crossed by the Rover Project (Miles) a

Facility b	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	Total Miles
Sherwood Lateral	0.0	0.0	0.1	1.2	4.2	18.4	27.2	0.0	2.9	**54.0**
Seneca Lateral	0.0	0.0	0.0	0.2	4.2	10.4	10.7	0.0	0.9	**26.3**
Majorsville Lateral	0.0	0.0	0.0	0.4	1.5	7.5	12.5	0.0	1.7	**23.6**
Mainline A and B c	0.0	0.0	6.9	4.9	9.6	13.0	5.2	0.0	0.0	**39.6**
Clarington Lateral	0.0	0.0	1.3	5.0	7.6	8.5	8.4	0.1	1.5	**32.4**
CGT Lateral	0.0	0.0	0.0	0.0	0.1	0.7	4.6	0.0	0.4	**5.8**
Cadiz Lateral	0.0	0.0	0.0	0.5	0.7	1.8	0.4	0.0	0.0	**3.5**
Burgettstown Lateral	0.0	0.0	0.9	2.9	16.2	19.4	10.8	0.3	1.2	**51.7**
Berne Lateral	0.0	0.0	0.0	0.1	1.6	0.2	2.4	0.0	0.1	**4.3**
Total Miles	**0.0**	**0.0**	**9.2**	**15.2**	**45.7**	**79.9**	**92.2**	**0.4**	**8.7**	**241.2**

Note: Mathematical discrepancies are due to rounding.

a A score of 1 indicates the lowest chance of a landslide occurring across the miles indicated, and a 9 indicates the highest chance of a landslide occurring.

b The Market Segment is considered to be of low to moderate landslide hazard and is not included in this table. See table 4.1.3-2 for the Market Segment Landslide Incidence ratings.

c Supply Connector Lines A and B are included with the Mainline A and B.

Source: Terracon, 2015b

4.1.3.5 Flash Flooding

The National Weather Service defines a flash flood as a flood caused by heavy or excessive rainfall in a short period of time generally less than 6 hours (NWS, 2010). The potential for flash flooding to occur and significantly impact construction or operation is low but possible in streams along the Rover pipelines. The greatest potential for flash flooding to occur along waterbodies in the area of the Rover Project is associated with high intensity, short-duration storm events. The potential for higher water levels during flash flooding events may be increased by the clearing of vegetation and soil disturbance caused by the construction of the pipeline. Section 4.3.2.6 provides a discussion of the potential for scour to occur along the Project. Information about waterbodies in the vicinity of the Rover Project is presented in section 4.3.2

The work to be conducted as part of the Panhandle and Trunkline Projects would be limited to modifications at existing facilities and no waterbody crossings are associated with these Projects. Therefore, the potential for hazards from flash flooding for these Projects is very low.

4.1.3.6 Ground Subsidence

Common causes of ground subsidence include the presence of karst terrain, underground mining, and significant groundwater or fluid withdrawal, such as that associated with oil-producing regions. Ground subsidence can affect pipelines and aboveground facilities by causing loss of support that could result in bending and/or rupture of pipelines and the weakening of foundations of aboveground facilities. For buried pipelines, the areas of greatest concern are at the edges of the zone of subsidence. This is where permanent differential ground displacements are highest and where the greatest stresses in the pipeline are likely to occur. As part of Rover's geo-hazard evaluation (see section 4.1.3.4), Rover developed a subsidence hazard model that identifies the potential susceptibility of an area to subside due to both underground mines and karst topography. Table 4.1.3-5 presents the summary results of the subsidence model for the Rover Project (Terracon, 2015b).

TABLE 4.1.3-5

Subsidence Hazard Model Score Summary a

	Score 1		Score 2		Score 3	
Facility	**Total Miles**	**% of Pipeline**	**Total Miles**	**% of Pipeline**	**Total Miles**	**% of Pipeline**
Burgettstown Lateral	2.4	5%	5.4	11%	1.2	2%
CGT Lateral	0	0%	0	0%	0	0%
Sherwood Lateral	0	0%	0.3	0%	0	0%
Majorsville Lateral	1	4%	14.1	60%	1.2	5%
Clarington Lateral	5.6	17%	14.8	46%	6.9	21%
Cadiz Lateral	1.1	30%	0	0%	0	0%
Berne Lateral	0	0%	0	0%	0	0%
Seneca Lateral	0	0%	4	15%	0	0%
Mainline A/B	34.9	17%	40.2	19%	0	0%
Market Segment ITC	1.1	1%	0	0%	0	0%

a A score of 1 indicates potential karst subsidence.
A score of 2 indicates a high probability of potential karst subsidence or mine extents.
A score of 3 indicates the potential for karst subsidence and overlapping mine extents.
Source: Terracon, 2015

Karst Topography

Karst features such as sinkholes, caves, and caverns can form as a result of the long-term action of groundwater on soluble carbonate rocks (e.g., limestone and dolostone), and collapse at ground level triggered by rainfall events. The risk of the development of sinkholes along the Rover pipeline routes is relatively low, based on a geologic literature review including USGS digital maps of karst topography (OHDGS, 1999; USGS, 2014a; Weary and Doctor, 2014). According to these maps, the Rover Project would cross 89.4 miles of areas that potentially have karst terrain, most of which are located completely in northwest Ohio. Rover evaluated potential karst conditions along the Rover Project using publicly available sources (Tetra Tech, 2015). Table 4.1.3-6 summarizes the findings of the report.

TABLE 4.1.3-6

Summary of the Karst Topography Investigation for the Rover Project Area

Section	Segment	MP	Probability of Karst Development
Supply Laterals	Burgettstown Lateral	0.0-52.0	Low
	CGT Lateral	0.0-6.0	Low
	Sherwood Lateral	0.0-54.0	Low
	Majorsville Lateral	0.0-24.0	Low
	Clarington Lateral	0.0-33.0	Low
	Cadiz Lateral	0.0-3.0	Low
	Berne Lateral	0.0-4.0	Low
	Seneca Lateral	0.0-26.0	Low
	Supply Connector Line A and B	0.0-128.0	Low
Mainlines	Mainlines A and B	128.0-161.0	High
	Mainlines A and B	161.0-195.0	Moderate
	Mainlines A and B	195.0-210.0	Low
Market Segment	Market Line	0.0-93.0	Low
	Market Line	93.0-100.0	Low

Source: Tetra Tech, 2015

The results were used by Rover to conduct additional analysis in areas of known and probable karst areas, including a more refined desktop aerial photographic analysis and field surveys. The aerial and follow-up field surveys identified five areas that would require monitoring by a geologist during construction. These areas are found along Mainlines A and B in Seneca, Hancock, Wood, and Henry Counties, Ohio:

- MPs 138.70 to 139.20;
- MPs 140.80 to 141.50;
- MPs 143.00 to 143.70;
- MPs 159.22 to 159.30; and
- MPs 159.65 to 159.75.

However, Rover has not indicated if it would have a professional geologist monitor these areas during construction; therefore to adequately assess the impacts on these karst areas, **we recommend that:**

- **Rover should hire a professional geologist to monitor construction of the Project in the five areas that were identified in the January 2016 Field Reconnaissance of Karst Prone Areas Report.**

The Panhandle and Trunkline Projects are not located in areas known to have karst features (National Atlas, 2012).

Mining Hazards

Two types of mining could present ground subsidence hazards to the Projects. Longwall mining proceeds by excavating rectangular panels that vary in size from 500 to 2,000 feet in width and 5,000 to 12,000 feet in length. Longwall mines are designed so that the ceiling of each panel is temporarily supported while excavation is ongoing. When excavation is complete, the supports are withdrawn to deliberately collapse the ceiling. A long-term study of subsidence due to longwall mining operations in the Pittsburgh Coal bed in Pennsylvania, West Virginia, and Maryland by the U.S. Bureau of Mines demonstrated that subsidence began essentially with undermining, and that less than 10 percent took place in the first 30 days, 60 to 90 percent within 60 days, and that subsidence was complete within 1 year (USDOI, 1995). Unanticipated subsidence can occur when intentional collapse of a longwall panel's ceiling is not complete and uniform, as this leaves voids that later fall in. Following collapse of the longwall panel, the surface above the panel generally subsides 3 to 5 feet (PADEP, 2004a). Subsidence above completed longwall panels forms troughs that tend to be elliptical in shape. Downward vertical movement occurs at all areas within the trough, greatest at the center and decreasing outward.

Room and pillar mines are designed to leave columns of coal intact, which are shored up with timbers to provide sufficient support to keep the overburden from falling in. Consequently, the surface above a room and pillar mine should not subside. On occasion, room and pillar mines are closed by removing portions of the remaining pillars in order to extract additional coal, which results in a deliberate and controlled collapse of parts of the mine that can cause surface subsidence. Unanticipated subsidence can occur if the columns of coal and timbers left in place in an abandoned room and pillar mine deteriorate and give way under the weight of the overburden. However, for abandoned room and pillar mines, it "is difficult, if not impossible, to predict if or when failure … might occur" (PADEP, 2010) or to predict the magnitude of surface subsidence, unless accurate mine location and dimension information is available. Surface subsidence due to room and pillar mining with less than 100 feet of cover (vertical distance between the coal seam and the surface) could be as much as 50 percent of the vertical mining height. According to the PADEP, subsidence attributable to the collapse of room and pillar mining usually occurs where the vertical distance between the coal seam and the surface is less than 50 feet (PADEP, 2010).

As stated above in section 4.1.3.4, Rover conducted a desktop review of the Project area to identify and evaluate areas with potential geological hazards, including areas that have, or are likely to have, underground and surface mines. Table 4.1.3-5 provides the summary results of Rover's subsidence hazard evaluation.

4.1.3.7 Shallow Bedrock

Soils with bedrock present within 5 feet of the surface are considered to have shallow depth to bedrock. Areas with shallow bedrock classifications were identified using USGS data (USGS, 2007a, 2007b, 2008). It is not anticipated that blasting would be required for construction of any of the Projects. If shallow bedrock is encountered, other methods of bedrock removal such as ripping, chipping, or grinding would be used to remove bedrock. The Rover Project would traverse 172.0 miles of areas identified to have shallow depth to bedrock (USDA, 2015).

The Panhandle and Trunkline Projects would not cross areas with shallow depth to bedrock. Areas of shallow depth to bedrock that would be crossed by the Rover Project are listed in appendix K and summarized in table 4.1.3-7.

TABLE 4.1.3-7

Areas of Shallow Depth to Bedrock Crossed by the Rover Pipeline Project

Component	Miles Crossed Competent Bedrock	Miles Crossed Weathered Bedrock a	Total Shallow Bedrock Miles Crossed b
Berne Lateral	2.6	0.8	3.4
Burgettstown Lateral	20.6	8.7	29.3
Cadiz Lateral	0.0	0.1	0.1
CGT Lateral	4.5	0.9	5.4
Clarington Lateral	19.3	1.9	21.2
Majorsville Lateral	20.9	0.6	21.5
Seneca Lateral	22.1	1.4	23.4
Sherwood Lateral	22.4	22.6	45.0
Supply Connector Lines A and B	4.5	7.0	11.5
Mainlines A and B	6.7	4.5	11.2
Market Segment	0.0	0.0	0.0
Total	**123.6**	**48.4**	**172.0**

a Weathered bedrock (paralithic) is easier to remove using conventional methods than is competent bedrock (lithic).
b Mathematical discrepancies are due to rounding.
Source: USDA, 2014a

4.1.3.8 Blasting

The Rover Project would cross soils with shallow depth to bedrock; however, Rover intends to use mechanical methods other than blasting in these areas. In the unlikely event that Rover encounters bedrock that cannot be excavated using conventional methods, blasting may be required. Rover has provided a general blasting plan that is provided in appendix G.

The Panhandle and Trunkline Projects would involve only minor construction activities associated with modifications to existing aboveground facilities. Minimal excavation would be required and would be limited to areas that have been previously disturbed. In areas where excavation would occur, none of the soils were identified as having bedrock present in the upper 60 inches of the soil or classified as stony/rocky soils. Therefore, blasting would not be required in these areas.

4.1.4 Paleontological Resources

Paleontological resources, including plant, invertebrates, and vertebrate fossils, may be found in a variety of geologic formations. Potential impacts on paleontological resources associated with the Projects may occur as a result of construction and may include impacts from trenching a pipeline, using heavy equipment, grading, and excavation. We do not anticipate that construction of the Projects would uncover significant paleontological resources, and no known paleontological sites have been identified. However, there is the potential for unanticipated discovery of fossils along the entirety of the Rover pipeline routes especially in areas of shallow bedrock or where bedrock removal is necessary. To minimize impacts on paleontological resources that may be uncovered during pipeline construction, Rover would follow the procedures provided in its Paleontological Discovery Plan. Additional details on how Rover would handle an unanticipated discovery are provided in section 4.1.5.

Due to the work being limited to modifications to existing facilities and ground breaking being limited to shallow excavation occurring on previously disturbed soils, we conclude paleontological resources would not be impacted by the Panhandle and Trunkline Projects.

4.1.5 General Impacts and Mitigation

The overall effect of the Projects on geologic resources would be minor. The primary effect of pipeline construction on geologic resources would be restrictions on mining operations in proximity to the pipelines and disturbances to steep topographic features. As described in section 2.3, all areas disturbed during construction, including those considered rugged terrain, would be graded and restored as closely as possible to pre-construction contours during cleanup and restoration. Restoration would start within 20 days after the completion of pipeline construction. In areas where dual pipelines would be installed, restoration would begin within 20 days of backfilling of the second trench. Panhandle and Trunkline have adopted our Plan and Procedures and would use them to restore land disturbed by modifications to the existing facilities.

There are approximately 60 active mines and 57 inactive mines within 0.25 mile of the Rover Project (there are no mines associated with the Panhandle and Trunkline Projects). Of these mines, Rover's Project would cross 71 underground and 34 surface mines. Rover would establish communication plans and work with mine operators to prevent any impacts on the mining operations or hazards to the pipeline. Construction and operation of the Projects would not result in a significant impact on either current or future mining or oil and gas operations. Any restriction on such operations in the Project areas would be determined through an easement agreement between the applicants and the relevant mine operator. The easement agreement would provide guidance on where excavation could occur within an easement, heavy equipment crossing requirements, notices, and blasting requirements. Additionally, underground mining would be limited to a depth of 300 feet or more within the pipeline easement and would be negotiated with the mine operator. Aboveground mining would not be permitted within the permanent pipeline easement. If possible, Rover would purchase the mineral rights for aboveground facilities where subsurface coal is located.

The nearest active oil or natural gas well to the Projects is 2.2 feet away from the Rover pipeline construction right-of-way. This is an oil well near MP BGL 4.0. Rover would follow measures to minimize hazards when installing the pipeline within 100 feet of oil and gas wells. These measures include the installation of warning signs and safety fences along the work area within 100 feet of any well. Welding activities that would take place within 100 feet of a well would require hot work permits and a fire watch. Rover would also prefabricate the section of the pipeline within 100 feet of a well in order to minimize welding activities required in the area.

There is potential for an unknown abandoned oil or gas well to be discovered during pipeline construction. If an unknown well were encountered during construction, Rover would report the well to the appropriate state agencies and attempt to ascertain the well owner in order to facilitate well closure if needed. If required, Rover would adjust the route to avoid the previously unknown well. Because the Panhandle and Trunkline Projects would take place entirely at existing facilities, potential impacts on mineral resources (i.e., mines and wells) are not expected.

Based on the low probability of localized earth movements or geologic hazards in the vicinity of the Projects, we do not anticipate any impacts attributable to such movements or hazards. Maintained pipelines constructed using modern arc-welding techniques have performed well in seismically active areas of the United States, such as California (O'Rourke and Palmer, 1994b). Only large, abrupt ground displacements have caused serious impacts on pipeline facilities. Due to the limited potential for large seismically induced ground movements in the area of the Projects, there is very little risk of earthquake-related impacts on the pipeline and other Project facilities. The Rover Project would cross the Bowling Green Fault at approximate MP MAB 170; however, there are no mapped faults within the Rover Project known to generate seismic events of magnitude 6 or greater. Several of the facilities that are part of the Trunkline Project are in proximity to the New Madrid Fault Zone; however, due to work being limited to modifications to existing facilities, we do not believe seismicity poses a significant hazard to the Trunkline Project. Conditions necessary for soil liquefaction to occur would likely be present in some portions of the Project areas. However, due to the low potential for strong and prolonged ground shaking associated with a seismic event to occur, the potential for soil liquefaction to occur in the vicinity of the Projects is very low.

Several areas exist along the Rover Project area that have steep slopes and have a high susceptibility for landslide activity. Rover prepared a geo-hazard evaluation of areas of steep slopes and landslides. Mitigation measures recommended in the report include minimizing the clearing of vegetation, avoiding over-steepening or undercutting of slopes, alterations to the natural drainage, and use of BMPs for stormwater drainage and control. The geo-hazard evaluation also included potential mitigation measures for observed hazards relating to steep slopes and landslides, including:

- placing spoils on downslope side of excavation and flattening or reducing slope height should ground movement be observed;
- using soil erosion BMPs such as hay bales, silt fence, and channel control for soil erosions;
- establishing ditches, positive drainage, and surface grading for surface water runoff;
- using sumps, point wells, and vertical and horizontal drains if groundwater seepage is encountered;
- using retraining structures and/or angles as well as consulting a geotechnical engineer for steep, angled, or scalloped bedrock; and
- avoiding blasting and using specialized equipment in areas where there are boulders.

However, Rover has not indicated if it would follow these additional measures; therefore, **we recommend that:**

- **<u>Prior to construction</u>, Rover should file with the Secretary clarification that it has adopted the mitigation measures outlined in its October 2015 Geohazard Evaluation Report.**

Rover would implement BMPs on a site-specific basis as stated in its Plan to address slope stability and construction on steep slopes. The BMPs that would be implemented are based on past working experience and guidance from the FERC's Plan and include:

- burial of the pipeline to a deeper depth;
- installation of drainage systems (French drain) to drain stormwater away from the right-of-way;
- installation of temporary and permanent trench plugs;
- avoiding changes to natural drainage patterns;
- use of trench breakers to prevent water from draining down the trench;

- use of riprap, shoring, jute matting, waddles, reinforced fill, compacted fill, rock lined swales;
- periodic inspection of the right-of-way for the life of the pipelines and inspection after rain events during construction and restoration; and
- periodic monitoring of the pipeline in areas where there is a potential landslide hazard for 2 years following the completion of construction.

Panhandle and Trunkline Projects would use the BMPs provided in the FERC's Plan throughout construction.

Federal regulations administered by the DOT/PHMSA (49 CFR 192.317) require that pipeline "operator(s) must take all practicable steps to protect each transmission line or main from washouts, floods, unstable soil, landslides, or other hazards that may cause the pipeline to move or to sustain abnormal loads." Rover has designed waterbody crossings and aboveground facilities located within flood plains to minimize potential impacts from flash flooding, scouring, and high flow velocities during pipeline construction and operation. High flow mitigation measures during construction include providing equipment to handle increased flow, such as standby pumps at dam-and-pump locations and sizing flume pipes to be able to accommodate storm level flows. A concrete coating would be applied to the pipeline where installed beneath waterbodies to reduce the buoyancy of the pipe and prevent surfacing of the pipeline during a flooding event. Flash flood events in areas cleared of vegetation could cause sedimentation and erosion. Rover's Plan requires the inspection and maintenance of temporary erosion control measures on at least a daily basis until either permanent erosion control measures are installed or restoration is complete. All work areas would typically be final graded and restored to pre-construction contours and natural drainage patterns as closely as possible within 20 days of trenching, weather permitting (the second trench along the dual pipeline section may require more than 20 days, but would be completed as soon as feasible). Remaining vegetation and erosion and control measures, such as trench breakers or slope breakers, would assist in minimizing erosion until vegetation grows back.

Ground subsidence is a potential hazard in several areas along Rover's Project. Karst features such as sinkholes, caves, and caverns can form as a result of the long-term action of groundwater on soluble carbonate rocks (for example, limestone and dolostone). The risk of the development of sinkholes along the proposed pipeline is low; however, there are still several areas where karst hazards may potentially be present along the pipeline route. Rover conducted a desktop analysis of the Project area to identify karst-prone areas. Rover will use the results of this analysis to conduct a more in-depth review of those areas identified with a moderate or high likelihood of containing karst terrain and develop site-specific recommendations and mitigation methods for construction within karst-prone areas. Rover has also developed a general Karst Mitigation Plan to mitigate potential impacts and hazards from karst features (see appendix G). BMPs that may be used by Rover during construction in areas of karst terrain include:

- installing stormwater control measures;
- monitoring sediment/erosion control measures throughout the construction process and after rain events;
- using additional erosion control techniques such as two rows of silt fencing where water flows into a karst feature such as a sinkhole, swallow hole, karst conduit or cave;
- refueling vehicles at least 200 feet from a karst feature opening;
- staging construction waste and debris away from karst terrain;
- adhering to Rover's Spill Procedures to minimize and remediate any inadvertent releases or spills;

- monitoring of unidentified existing wells and springs within karst areas;
- maintaining natural groundwater recharge rates by adhering to Rover's Karst mitigation plan and following the measures put forth in Rover's Plan and Procedures;
- revegetating disturbed areas after construction activities are complete;
- discharging hydrostatic test waters away from areas of known karst terrain;
- contacting geotechnical specialists if karst features are found during construction; and
- monitoring pre- and post-construction of well yield and water quality for all wells located 150 feet from the construction work area or within 2,000 feet of HDD locations. If a well were determined to be impacted by construction, Rover would compensate the landowner with an alternative water source or new comparable well. (No potable springs have been identified within 150 feet of the Project.)

In addition to the standard BMPs for controlling erosion at locations where water may flow into a karst feature, additional measures would be employed by Rover. These measures may include the use of at least two rows of silt fencing, monitoring of sediment and erosion control measures throughout construction and after a rain event, routing of runoff to sediment ponds, routing water away from the karst feature, or containerization of stormwater. Additionally we are recommending in section 4.1.3.6 that Rover hire a professional geologist to monitor construction in the five areas of known or potential karst geology identified in its *January 2016 Field Reconnaissance of Karst Prone Areas* report.. Karst features would not be crossed by the Panhandle or Trunkline Projects, therefore the associated potential increased risk of ground subsidence is not a concern in these areas.

Ground subsidence could also occur due to active or historical mines crossed by Rover's Project. In areas of active mining, Rover would communicate with mine operators to determine when and where planned subsidence would occur. Rover would conduct inspections prior to construction to determine where and what modifications would be required to reduce subsidence hazards to the proposed pipelines. In known subsidence areas, Rover may use grouting, dynamic compaction, geo grid foundations, slanted trench wall design, a thicker-walled pipe, pipe with gentler bends, granular backfill, contraction and extension joints, and/or vertical supports to mitigate potential subsidence hazards. Rover would conduct post-construction monitoring to identify any potential subsidence hazards. In areas where active mining has taken place, inspections would be conducted by trained field engineers. In certain situations, Rover may also use measures such as domain reflectometry to conduct long-term real-time monitoring of subsidence conditions.

Due to the nature of the construction at the Panhandle and Trunkline Project areas, blasting would not be required. Rover also does not anticipate the need for blasting during construction of its Project. Rover would first attempt to remove bedrock by using conventional methods such as ripping; however, blasting may become necessary. Rover would comply with all federal, state, and local regulations for blasting and has developed a Blasting Plan (see appendix G) that describes the blasting protocols and mitigation measures that would be used if blasting would be needed.

As discussed in section 4.1.3.8, general mitigation measures include installation of blasting mats in congested areas, shallow waterbodies, and near structures as well as the use of warning signals, flags, and barricades. Rover would work with landowners to evaluate complaints of damage to personal property potentially caused by blasting activities. Due to the potential for contamination and increased turbidity, Rover would conduct pre- and post-blasting surveys to evaluate the condition of structures, wells, and springs within 150 feet of the proposed construction work areas in which blasting occurred.

To minimize impacts on paleontological resources that may be uncovered during pipeline construction, Rover would follow the procedures provided in its Paleontological Discovery Plan and would notify the Pennsylvania Department of Conservation and Natural Resources, the West Virginia Geological and Economic Survey, the Curator at Orton Geological Museum at Ohio State University, or other contacts at Western Michigan University, depending on where the unanticipated discovery is made. No impacts on paleontological resources are anticipated by the Panhandle and Trunkline Projects due to the work being limited to modifications to existing facilities and ground breaking being limited to shallow excavation occurring on previously disturbed soils.

4.2 SOILS

4.2.1 Existing Conditions

The soils crossed by the Projects were identified and assessed using various data sources including digital soils data such as the Soil Survey Geographic Database (SSURGO) database and published soil surveys, where available. The SSURGO database is a digital version of the original county soil surveys developed by the U.S. Department of Agriculture (USDA) and the NRCS for use with a GIS (USDA, 2014a). It provides detailed soils information for natural resource planning and management. The attribute data within the SSURGO database provides the proportionate extent of the component soils and their properties for each soil map unit. The U.S. General Soil Map was obtained from the NRCS Soil Data Mart and the NRCS Web Soil Survey.

4.2.1.1 Pipeline Facilities

The Rover pipeline would cross approximately 340 different soil series associations, series, or complexes. The Rover Project would primarily affect loam soils, the majority of which are silty loams with a wide variety of characteristics. The soil series types that would be crossed by the Rover pipelines are listed by milepost in appendix K.

4.2.1.2 Aboveground Facilities

Compressor stations along the Rover Project would cross 34 soil series types, the majority of which are moderately well to well drained and have a high potential to be eroded by water. The Rover meter stations would be located on 24 different soil types which display a wide variety of characteristics. Rover’s mainline valves would be constructed within the pipeline right-of-way; therefore, soil types are a subset of those discussed in section 4.2.1.1 and appendix K for the associated pipeline segments. Rover’s contractor yards would temporarily affect 43 soil series types, and the access roads would cross 139 soil series types, the majority of which are not hydric and do not have a high potential to be compacted.

The Panhandle Project consists of modifications to existing facilities in Ohio, Michigan, Indiana, and Illinois. The Panhandle Project would be located on eight different soil types. The soil series textures within these soil types range from silty loam to clay loam, and topography is relatively flat with slopes ranging from 0 percent to 2 percent.

The Trunkline Project consists of modifications to existing facilities in Illinois, Tennessee, and Mississippi. The Trunkline Project would be located on six different soil types. The soils series within these soil types range from gently sloping to relatively flat and consist of a variety of loams including silty, sandy, and silty clay.

4.2.2 Standard Soil Limitations

Several soil characteristics have the potential to affect, or be affected by, construction and operation of the Projects. These include erosion potential by both wind and water, shallow depth-to-bedrock, stony and rocky soils, compaction potential, poorly drained and hydric soils, and prime farmlands and farmlands of statewide importance. Tables 4.2.2-1 and 4.2.2-2 provide a summary of the soil limitations that would be crossed by the Rover Project pipelines and aboveground facilities, respectively. Table 4.2.2-3 provides a summary of the soil types and soil limitations associated with the Panhandle and Trunkline Projects.

4.2.2.1 Erosion by Water and Wind

Erosion is a natural process that can be accelerated by human disturbance. Factors such as soil texture, structure, slope, vegetation cover, rainfall intensity, and wind intensity can influence the degree of erosion. Soils that are most susceptible to erosion by water are typified by bare or sparse vegetation cover, non-cohesive soil particles with low infiltration rates, and moderate to steep slopes. Soils that are typically more resistant to erosion by water include those that occupy low relief areas, are well vegetated, and have high infiltration capacity and permeability. Wind erosion processes are less affected by slope angles than water erosion processes. Wind-induced erosion often occurs on dry soil where vegetation cover is sparse and strong winds are prevalent.

The potential for soils to be eroded by water was evaluated based on the soils' K factor, where available, and slope of the ground surface. The K factor represents a relative quantitative index ranging from 0.02 (low susceptibility) to 0.64 (high susceptibility) that identifies the susceptibility of bare soil to particle detachment and transport by water; it is one of the factors used in the Revised Universal Soil Loss Equation to calculate soil loss (USDA, 2013a).

Construction of the Rover pipelines would affect about 2,598.2 acres of soils that are identified as having a high potential for erosion by water (see table 4.2.2-1). These soils would be restored and returned to pre-construction conditions in accordance with Rover's Plan. The majority of the soils with a high potential for erosion by water, about 70 percent, are associated with the Supply Laterals. These areas are primarily in Pennsylvania, West Virginia, and eastern Ohio. The Rover pipelines would not affect soils with a high potential to be eroded by wind. A soil's susceptibility to wind erosion can be estimated using its wind erodibility group (WEG) number. WEGs are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. Soils with a WEG of 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible (ORDEQ, 2005 A total of 214.2 acres of highly water-erodible soils would be disturbed by construction of the Rover Project's aboveground facilities, of which 36.6 acres would be within the operational footprint of the Project (see table 4.2.2-2). Construction of these aboveground facilities would also affect 1.6 acres of soils with a high potential for erosion by wind.

None of the soils that would be affected by construction of the Panhandle or Trunkline Projects are susceptible to wind erosion. However, the majority of the soils that would be associated with the Trunkline Project are susceptible to water erosion. In total, 129.9 acres of soils associated with the Trunkline Project have been identified as having a high potential to be eroded by water. For the locations associated with the Panhandle Project, three of the eight Project sites are susceptible to erosion by water resulting in a total of 146.5 acres of soils with a high potential to be eroded by water (see table 4.2.2-3).

TABLE 4.2.2-1

Summary of Soil Limitations Crossed by the Rover Pipeline Project (Acres) a

	Prime Farmlands b		Hydric Soils c		Compaction Prone Soils d		High Water Erosion Potential e		High Wind Erosion Potential f		Poor Revegetation Potential g		Shallow Depth to Bedrock h		Rocky Soils i	
Facility	**Constr.**	**Oper.**	**Constr.**	**Oper.**	**Constr.**	**Oper.**	**Constr.**	**Oper.**	**Constr.**	**Oper.**	**Constr.**	**Oper.**	**Constr.**	**Oper.**	**Constr.**	**Oper.**
Sherwood Lateral	342.6	123.8	2.4	1.1	0.0	0.0	611.0	211.3	0.0	0.0	0.0	0.0	803.4	283.4	276.6	91.6
CGT Lateral	21.8	11.4	0.0	0.0	0.0	0.0	65.6	32.7	0.0	0.0	0.0	0.0	65.3	32.7	0.3	0.0
Seneca Lateral	28.2	9.8	0.0	0.0	0.0	0.0	333.8	117.6	0.0	0.0	32.5	32.5	369.3	128.1	261.3	91.0
REX Interconnect	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.0	0.0	0.0	0.0	0.0	0.7	0.4	0.7	0.4
Berne Lateral	2.9	1.7	0.0	0.0	0.0	0.0	52.4	24.7	0.0	0.0	17.4	7.6	16.7	7.8	9.1	4.2
Clarington Lateral	92.6	32.5	0.4	0.2	0.0	0.0	259.0	87.9	0.0	0.0	0.0	0.0	360.0	124.7	248.8	86.4
Majorsville Lateral	64.0	33.7	0.0	0.0	0.0	0.0	163.9	86.1	0.0	0.0	0.0	0.0	193.6	100.8	147.4	77.2
Cadiz Lateral	25.6	9.1	0.0	0.0	0.0	0.0	30.8	10.0	0.0	0.0	18.5	6.2	15.2	5.1	21.9	7.4
Burgettstown Lateral	515.9	188.3	4.3	1.6	4.3	1.6	306.5	115.8	0.0	0.0	0.0	0.0	499.6	184.2	298.7	110.6
Supply Connector Lines A and B	182.3	0.0	0.0	0.0	10.2	0.0	171.5	0.0	0.0	0.0	0.0	0.0	184.1	0.0	62.2	0.0
Mainlines A and B	3,018.0	1,238.4	1,181.4	475.7	1,098.4	441.0	434.9	184.5	0.0	0.0	0.0	0.0	1,538.7	623.5	110.4	47.6
Market Segment	1,607.2	532.2	559.7	190.3	376.1	125.6	167.1	58.6	0.0	0.0	0.0	0.0	172.5	57.9	5.4	1.8
Total	**5,901.1**	**2,180.9**	**1,748.3**	**668.9**	**1,489.0**	**568.2**	**2,598.2**	**930.2**	**0.0**	**0.0**	**68.3**	**46.3**	**4,219.1**	**1,548.6**	**1,442.8**	**518.2**

TABLE 4.2.2-1 (continued)

Summary of Soil Limitations Crossed by the Rover Pipeline Project (Acres) a

Source: USDA, 2014a

a Numbers are rounded to the tenths of a decimal point for presentation purposes. Any mathematical discrepancies are due to rounding.

b Prime farmland soils include prime farmland and farmland of statewide importance, as designated by the NRCS. There are no farmlands of unique importance listed along the Project corridor.

c These acreages represent Rover's proposed Project and do not incorporate the reductions in the wetland acreage impacts resulting from FERC's determination that Rover must reduce its construction right-of-way through wetlands for both single and dual pipeline installation. For more information, see section 4.4.4.

d Compaction prone soils include those soils with a clay loam or finer texture and a drainage class designated as somewhat poor, poor, or very poorly drained.

e High Water Erosion Potential includes soils with slopes > 5% and a K factor > 0.32 as well as soils characterized by all slopes being > 15% (regardless of K factor).

f Wind Erodibility Groups (WEG) are made of soils that have similar properties that affect their susceptibility to wind erosion in cultivated areas. WEGs were obtained from the SSURGO GIS geodatabase. WEGs range from 1 to 8, with 1 being the highest potential for wind erosion, and 8 the lowest. Highly wind erodible soils include those in WEGs 1 or 2.

g The ability of soils within the Project area to support successful revegetation was determined by using the revegetation potential of grasses as recorded in the SSURGO database.

h Shallow soils have bedrock at less than 60 inches below the ground's surface, as recorded in the SSURGO database.

i Rocky soils include those with a cobbley, stony, bouldery, shaly, channery, very gravelly, or extremely gravelly modifier to the textural class of the surface layer and/or that have a surface layer that contains greater than 5% by weight rock fragments larger than 3 inches.

TABLE 4.2.2-2

Summary of Soil Limitations at Aboveground Facilities for the Rover Pipeline Project (Acres) a

Aboveground Facility	Prime Farmland b		Hydric Soils c		Compaction Prone Soils d		High Water Erosion Potential e		High Wind Erosion Potential f		Poor Revegetation Potential g	
	Constr.	Oper.	Constr.	Oper.	Constr.	Oper.	Constr.	Oper.	Constr.	Oper.	Constr.	Oper.
Compressor Stations												
Sherwood Compressor Station	2.3	1.8	0.0	0.0	0.0	0.0	34.5	5.2	0.0	0.0	16.5	0.0
Seneca Compressor Station	0.0	0.0	0.0	0.0	0.0	0.0	25.0	5.6	0.0	0.0	0.0	0.0
Clarington Compressor Station	0.0	0.0	0.0	0.0	0.0	0.0	33.3	4.0	0.0	0.0	8.2	0.1
Majorsville Compressor Station	9.0	3.7	0.0	0.0	0.0	0.0	8.0	0.6	0.0	0.0	6.0	0.6
Cadiz Compressor Station	0.0	0.0	0.0	0.0	0.0	0.0	19.9	7.8	0.0	0.0	20.1	7.8
Burgettstown Compressor Station	1.9	0.0	0.0	0.0	0.0	0.0	16.0	5.4	0.0	0.0	15.9	5.4
Mainline Compressor Station 1	32.7	11.1	0.0	0.0	0.0	0.0	13.2	2.1	0.0	0.0	0.0	0.0
Mainline Compressor Station 2	19.8	11.3	2.9	0.2	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Mainline Compressor Station 3	31.8	12.3	15.9	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Defiance Compressor Station	0.0	0.0	21.7	18.1	24.9	21.3	0.0	0.0	0.5	0.4	0.0	0.0
Compressor Station Total	*97.4*	*40.2*	*40.4*	*23.2*	*24.9*	*21.3*	*151.2*	*30.7*	*0.5*	*0.4*	*66.8*	*14.0*
Meter Stations												
CGT Meter Station	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Berne Meter Station	0.0	0.0	0.0	0.0	0.0	0.0	6.3	1.0	0.0	0.0	0.0	0.0
Madison Meter Station	1.4	0.5	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0
Gulfport Meter Station	0.0	0.0	0.0	0.0	0.0	0.0	8.6	0.4	0.0	0.0	0.2	0.0
Clarington A Meter Station	0.0	0.0	0.0	0.0	0.0	0.0	4.3	3.3	0.0	0.0	0.0	0.1
Majorsville Meter Station	1.4	0.4	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.0

TABLE 4.2.2-2 (continued)

Summary of Soil Limitations at Aboveground Facilities for the Rover Pipeline Project (Acres) a

Aboveground Facility	Prime Farmland b		Hydric Soils c		Compaction Prone Soils d		High Water Erosion Potential e		High Wind Erosion Potential f		Poor Revegetation Potential g	
	Constr.	Oper.	Constr.	Oper.	Constr.	Oper.	Constr.	Oper.	Constr.	Oper.	Constr.	Oper.
ANR Meter Station	1.4	0.3	7.9	2.2	7.9	2.2	0.0	0.0	0.0	0.0	0.0	0.0
Consumers Meter Station	4.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vector Meter Station	11.5	1.8	1.1	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Meter Station Total	*21.2*	*3.8*	*9.0*	*2.2*	*7.9*	*2.2*	*23.3*	*4.8*	*1.1*	*0.0*	*0.2*	*0.1*
Receivers and Tie-Ins												
REX Tie-In	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
CGT Tie-In	0.4	0.1	0.0	0.0	0.0	0.0	0.5	0.3	0.0	0.0	0.0	0.0
Sherwood Tie- In	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.5	0.0	0.0	0.0	0.0
Majorsville Receiver	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Majorsville Launcher	0.3	0.0	0.0	0.0	0.0	0.0	0.9	0.2	0.0	0.0	0.2	0.0
Cadiz Tie-In	2.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mainline B Receiver	1.1	1.0	1.1	1.0	1.1	1.0	0.0	0.0	0.0	0.0	1.1	1.0
Receiver/Tie-In Total	*4.4*	*1.4*	*1.1*	*1.0*	*1.1*	*1.0*	*3.1*	*1.1*	*0.0*	*0.0*	*1.2*	*1.1*
Aboveground Facility Total	*123.0*	*45.4*	*50.5*	*26.5*	*33.9*	*24.5*	*177.6*	*36.6*	*1.6*	*0.4*	*68.2*	*15.1*

Source: USDA, 2014a

Perm. = Permanent Effects; Temp. = Temporary Effects

a Numbers are rounded to the tenths of a decimal point for presentation purposes. Any mathematical discrepancies are due to rounding.

b Prime Farmland includes both prime farmlands and farmlands of statewide importance, as designated by the NRCS. No farmlands of unique importance were identified along the Project corridor.

c These acreages represent Rover's proposed Project and do not incorporate the reductions in the wetland acreage impacts resulting from FERC's determination that Rover must reduce its construction right-of-way through wetlands for both single and dual pipeline installation. For more information, see section 4.4.4.

d High Compaction Potential includes soils identified as having a clay loam or finer texture and a somewhat poor, poor, or very poorly drained drainage class.

e High Water Erosion Potential includes soils with slopes > 5% and a K factor > 0.32 and soils characterized by all slopes being > 15%, regardless of K factor.

f High Wind Erosion Potential for wind erodible soils include those with wind erodibility groups of 1 or 2.

g Poor Revegetation Potential reports soils with a poor revegetation potential for grasses.

TABLE 4.2.2-3

Summary of Soil Types and Limitations Associated with the Panhandle and Trunkline Backhaul Projects

Project / Facility	County	State	Acreage	Soil Type Name	Prime Farmland a	Compaction Potential b	Water Erosion Potential c	Wind Erosion Potential d	Revegetation Potential e	Hydric	Drainage
PANHANDLE BACKHAUL PROJECT											
Edgerton 10 Gate	Lenawee	MI	1.1	Ziegenfuss clay loam	Prime Farmland if Drained	Yes	No	No	High	Yes	Poorly Drained
Rover Interconnect	Defiance	OH	3.4	Paulding clay	Prime Farmland if Drained	Yes	No	No	Low	Yes	Somewhat Poorly Drained
Edgerton Compressor Station	Allen	IN	40.3	Nappanee silty clay loam	Prime Farmland if Drained	Yes	No	No	High	Yes	Somewhat Poorly Drained
Zionsville 3 Gate North and South	Hamilton	IN	1.7	Brookston silty clay loam	Prime Farmland if Drained	Yes	No	No	High	Yes	Poorly Drained
Zionsville Compressor Station	Marion	IN	108.0	Crosby silt loam	Prime Farmland if Drained	Yes	Yes	No	High	Yes	Somewhat Poorly Drained
Montezuma Compressor Station	Parke	IN	36.4	Fox loam	All Areas Prime Farmland	No	No	No	Low	No	Well Drained
Tuscola 6 Gate	Vermillion	IN	2.3	Russell silt loam	All Areas Prime Farmland	No	Yes	No	Low	No	Well Drained
Tuscola Compressor Station	Douglas	IL	36.2	Starks silt loam	Prime Farmland if Drained	Yes	Yes	No	Low	Yes	Somewhat Poorly Drained
TRUNKLINE BACKHAUL PROJECT											
Panhandle - Trunkline Interconnect	Douglas	IL	36.2	Starks silt loam	Prime Farmland if Drained	Yes	Yes	No	Low	Yes	Somewhat Poorly Drained
Bourbon Meter Station	Douglas	IL	14.4	Elburn silt loam	All Areas Prime Farmland	Yes	No	No	High	No	Somewhat Poorly Drained

TABLE 4.2.2-3 (continued)

Summary of Soil Types and Limitations Crossed by the Panhandle and Trunkline Backhaul Projects

Project / Facility	County	State	Acreage	Soil Type Name	Prime Farmland a	Compaction Potential b	Water Erosion Potential c	Wind Erosion Potential d	Revegetation Potential e	Hydric	Drainage
Johnsonville Compressor Station	Wayne	IL	38.2	Wynoose silt loam	Prime Farmland if Drained	Yes	Yes	No	Low	Yes	Poorly Drained
Joppa Compressor Station	Massac	IL	41.2	Stony silt loam	Prime Farmland if Drained	Yes	Yes	No	High	No	Somewhat Poorly Drained
Dyersburg Compressor Station	Dyer	TN	34.7	Grenada silt loam	All Areas Prime Farmland	No	Yes	No	High	No	Moderately Poorly Drained
Independence Compressor Station	Tate	MS	39.6	Providence -Ruston Complex	Not Prime Farmland	No	Yes	No	High	No	Moderately Well Drained

Source: USDA, 2014a

a Prime Farmland Soils includes both prime farmlands and farmlands of statewide importance, as designated by the NRCS. No farmlands of unique importance were identified along the Projects' corridors.

b High Compaction Potential includes soils identified as clay loam or finer texture and somewhat poor, poor, or very poorly drained drainage class.

c Soils with High Water Erosion Potential consist at least partially of slopes > 5% and a K factor > 0.32; or consist entire of slopes > 15%, regardless of K factor. See section 4.2.2.1 for information regarding soils K factor.

d High Wind Erosion Potential for wind erodible soils include those with wind erodibility groups (WEG) of 1 or 2. See section 4.2.2.1 for information regarding WEGs.

e Poor Revegetation Potential reports soils with a poor revegetation potential for grasses.

4.2.2.2 Shallow Depth to Bedrock and Stony-Rocky Soils

Soils with textural classifications including stony, cobbley, gravelly, shale, slate, and droughty in any layer, or with stones larger than 3 inches in the surface layer in greater than 15 percent of the area, may be characterized as stony or rocky soils. Shallow bedrock is considered prevalent where the depth to bedrock is less than 5 feet below the ground surface.

The Rover pipelines would cross about 1,442.8 acres of stony or rocky soils, 88 percent of which are associated with the Supply Laterals in Pennsylvania, West Virginia, and Ohio. The pipeline routes would cross 4,219.1 acres of soils with shallow depth to bedrock, which would be encountered along all of the Rover pipelines. Potential impacts from stony-rocky soils would be minimized on agricultural lands through the removal of rock fragments brought to the surface during construction. Topsoil removed from the trench line would be segregated and stockpiled during construction activities. In residential areas, replacement soil may be used instead of topsoil segregation methods. Prior to topsoil replacement, Rover would screen topsoil for rock fragments greater than 4 inches in diameter. Rock that is too large to be used as trench backfill would be windrowed at the edges of the right-of-way in upland areas where permitted by the landowner, disposed of on landowner property at a mutually acceptable location, or disposed of at a re-use facility. The trench may be backfilled with small rocky substrate, but it would only be filled to the height of the existing bedrock horizon. Neither stony-rocky soils nor soils with a shallow depth to bedrock were identified within the areas that would be excavated for the Panhandle and Trunkline Projects.

4.2.2.3 Compaction Potential

Soil compaction modifies the structure and reduces the porosity and moisture-holding capacity of soils. The degree of compaction was evaluated based on soils characterized as having a soil texture of clay loam or finer, and soils identified as somewhat poorly drained to very poorly drained. During construction, the Rover pipelines would temporarily affect 1,489.0 acres of soils considered to have high compaction potential. All but 14.5 acres of compaction-prone soils that would be affected by pipeline construction are along Mainlines A and B and the Market Segments in Ohio and Michigan. A total of 58.4 acres of compaction-prone soils would be disturbed during construction of the Defiance Compressor Station, ANR Meter Station, and Mainline B Tie-in.

Construction of the Panhandle and Trunkline Projects would affect 193.0 and 130.0 acres, respectively, of soils considered to have a high potential for compaction. These soils are located in Michigan, Ohio, Indiana, and Illinois for the Panhandle Project and at all facilities in Illinois for the Trunkline Project.

4.2.2.4 Poor Revegetation Potential

The revegetation potential of soils is based on several characteristics including topsoil thickness, soil texture, available water capacity, wetness, susceptibility to flooding, soil temperature, and slope. Some soils have characteristics that cause a high seed mortality. These areas may need additional management and may be difficult to revegetate. The clearing and grading of soils with poor revegetation potential could result in a lack of adequate vegetation following construction and restoration of the right-of-way, which could lead to increased erosion, a reduction in wildlife habitat, and adverse visual impacts. Construction of the Rover pipelines would cross 68.3 acres of soils classified as having poor revegetation potential. These are located across the entire Rover Project area. These areas would be restored to pre-construction conditions, with 46.3 of those acres in the permanent pipeline right-of-way. Several of the Rover aboveground facility sites are not well suited for vegetation growth. Construction of aboveground facilities would disturb 83.3 acres of soils with a poor revegetation potential, of which 15.1 acres would be within the operational footprint of those facilities. Four locations associated with the Panhandle

Project have soils with a low revegetation potential. In total, 78.3 acres of soils with low revegetation potential would be affected in Illinois, Indiana, and Ohio by the Panhandle Project. The Trunkline Project would affect about 74.4 acres of soils identified to have a low revegetation potential at the Panhandle-Trunkline Interconnect and the Johnsonville Compressor Station (both facilities are in Illinois).

4.2.2.5 Hydric Soils

The National Technical Committee for Hydric Soils defines hydric soils as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions (GPO, 1994). These soils are typically indicative of areas with a high mean water table and wetlands. However, agricultural lands can contain hydric soils that are no longer saturated due to managed hydrology for crop development. Agricultural lands often employ the use of ditches and drain tiles to allow for the production of crops. As proposed, construction of the Rover pipelines would affect 1,748.3 acres of hydric soils, about 68 percent of which is along Mainlines A and B, and about 32 percent of which is along the Market Segment. As proposed, a relatively small amount of hydric soils (i.e., 7.1 acres) is also present along the Burgettstown Lateral, Clarington Lateral, and Sherwood Lateral components. Rover's aboveground facilities would affect 77.0 acres of hydric soils. As discussed in section 4.4.4, we have determined that Rover should limit the width of the construction right-of way along single pipelines in wetlands to 75 feet, and the construction right-of-way along dual pipeline installation to 95 feet. The resulting decreases in wetland acreage impacts are discussed in section 4.4.4. Following construction, these areas along the pipeline rights-of-way would be restored to pre-construction contours and drainage patterns.

The majority of soils that would be affected by the Panhandle Project are identified as hydric. Two locations, the Montezuma Compressor Station and the Tuscola 6 Gate (both in Indiana), were not identified to contain hydric soils. In total, the Panhandle Project would affect 190.7 acres of hydric soils in Ohio, Michigan, Illinois, and Indiana. Construction of the Trunkline Project would affect 74.4 acres of soils identified as hydric, all of which are in Illinois at the Panhandle-Trunkline Interconnect and the Johnsonville Compressor Station.

4.2.2.6 Prime Farmland and Farmland of Statewide Importance

The USDA defines prime farmland as "land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, and oilseed crops" (USDA, 2014b). This designation includes cultivated land, pasture, woodland, or other lands that are either used for food or fiber crops, or are available for these uses. Urbanized land, built-up land, and open water cannot be designated as prime farmland. Prime farmland typically contains few or no rocks, is permeable to water and air, is not excessively erodible or saturated with water for long periods, and is not subject to frequent or prolonged flooding during the growing season. Soils that do not meet the above criteria may be considered prime farmland if the limiting factor is mitigated (e.g., by draining or irrigating).

The methods for defining and listing farmland of statewide importance are determined by the appropriate state agencies such as the Pennsylvania Department of Agriculture, typically in association with local soil conservation districts or other local agencies. Farmland of statewide importance generally includes areas that almost satisfy the requirements for prime farmland and which grow high yields of crops when managed in accordance with best farming methods.

Construction of the Rover pipelines would temporarily affect 5,901.1 acres of prime farmland and farmland of statewide importance. These farmlands would be crossed in Pennsylvania, West Virginia, Ohio, and Michigan; the largest amount of acreage affected would be in Ohio. Of the prime farmlands that would be crossed by Rover's pipelines, the majority (51 percent) are associated with Mainlines A and B. The locations of prime farmland and farmland of statewide importance that would be crossed by the

Rover pipelines are listed in appendix K. Rover's aboveground facilities would affect 168.4 acres of prime farmland soils, 45.4 acres of which would be permanently converted to industrial land for Project operation (see table 4.2.2-2).

All of the soils in the area of the Panhandle Project are considered to be prime farmland soil or "prime farmland if drained." The Panhandle Project would affect 38.7 acres and 190.7 acres of prime farmland soils and "prime farmland if drained" soils, respectively. The majority of the soils that would be affected during construction of the Trunkline Project are also identified to be prime farmlands or "prime farmlands if drained." About 49.1 acres of soil in the Trunkline Project area is considered to be prime farmlands and 115.6 acres are identified as "prime farmlands if drained" (see table 4.2.1-1). The only location along the Trunkline Project that does not cross prime farmlands or "prime farmlands if drained" is the Independence Compressor Station in Mississippi.

4.2.2.7 Contaminated Soil

As discussed in section 4.8, one brownfield site was identified within 0.25 mile of the Projects. The Kaul Clay brownfield site is about 350 feet south of MP BGL 16.3. An EPA brownfield assessment (EPA, 2012a) identified the presence of volatile organic compounds, semi-volatile organic compounds, petroleum products, and lead at the site. Prior to construction, Rover would identify locations where the potential for contaminated soils could exist. During construction, contaminated soils would be identified by visual and olfactory observation. In the event that unanticipated contamination is encountered during construction, Rover has stated it would stop work and vacate the contaminated area. The workers would then notify the Chief Inspector of the contamination, and any equipment potentially contaminated would be kept onsite. Rover would collect information about the contamination and notify the agencies listed in Rover's Spill Procedures. Only Hazardous Waste Operations-certified personnel would be allowed to enter the contaminated site and work to remediate the area. Rover would then contract with a licensed waste company to provide response, sampling, and disposal of the contaminated soil.

Panhandle and Trunkline would follow the procedures put forth in their Unanticipated Discoveries Plan for Contaminated Media[1] if contamination were to be discovered during construction of the Projects. If an unanticipated discovery of contaminated soil occurred, all work would be stopped at that location. The area would be flagged off; sorbent materials would be deployed, if needed; federal, state, and local agencies would be notified, if warranted; and a plan would be developed for the sampling, cleanup, and recommencement of work. All handling, identification, characterization, storage, transportation, record keeping, and disposal would be done in accordance with all federal, state, and local regulations.

4.2.2.8 Ground Heaving

Ground heaving is the uplifting of soil, typically based on the development and growth of ice lenses underneath the upper soil layer. Ground heaving or frost heaving is based on soil saturation, soil characteristics, and freezing temperatures. The maximum depth of frost penetration within the northwest area of the Projects does not exceed 5 feet in most years, and in the southeast area of the Projects it is about 3 feet (NOAA, 1978). The Rover pipelines would have a typical trench depth of 6.5 feet in the northwest where the 42-inch pipe would be laid and frost penetration is deepest. The likelihood of frost affecting soils below 6.5 feet is low. Additionally, the ground surrounding the buried pipeline would be warmed by natural gas flow in the winter, and aboveground facility foundations would be designed with

[1] The Panhandle and Trunkline Unanticipated Discovery Plans are available on the FERC's eLibrary website, located at http://ferc.gov/docs-filing/elibrary.asp, by searching Panhandle's Docket Number CP15-94-000 (Accession No. 20150423-5012) and Trunkline's Docket Number CP15-96-000 (Accession No. 20150422-5328).

ground heaving potential in mind. In areas that are saturated and water surrounds the pipe, weights would be used to counteract the buoyancy of the pipeline. These weights would also help to prevent effects from ground heaving to the pipeline. Based on these circumstances the risk of ground heaving and associated potential impacts on or from a pipeline from freeze-thaw action is low.

The work that would be performed as part of the Panhandle and Trunkline Projects is limited to modifications at existing facilities with active natural gas flow. Due to the fact that these facilities are generally located south of the Rover Project in areas with lower frost penetration (i.e., less than 4.1 feet) and that the existing flow of natural gas would warm the soils around the facilities, ground heaving is not a concern for the Panhandle and Trunkline Projects.

4.2.3 Contractor Yards

Rover's contractor yards would be located on 82.8 acres of highly water-erodible soils, 2.8 acres of highly wind-erodible soils, 80.4 acres of soils with poor revegetation potential, 78.4 acres of hydric soils, 227.1 acres of prime farmland or farmland of statewide importance, and 27.1 acres of soils with a high compaction potential. These contractor yards would be returned to pre-construction conditions following construction and would not represent new permanent impacts on soil resources. Depending on the condition of the contractor yards prior to their use for the Rover Project, site improvements could be required and could include sediment and erosion control, improved drainage, topsoil segregation on agricultural lands, grading, placement of surface materials (crushed rock), and creation of internal roadways. Shallow depth to bedrock is not of concern at the contractor yard sites, because trenching would not be conducted in these areas. A summary of soil limitations and the acreages that would be affected by the use of contractor yards for the Rover Project are provided in table 4.2.3-1.

Contractor yards for the Panhandle and Trunkline Projects would be within the boundaries of the existing facilities that are proposed for modification. Therefore, soil types crossed would be the same as those for their aboveground facilities.

4.2.4 Access Roads

A total of 73.7 miles of access roads would be used during construction of the Rover Project, which would result in minimal disturbance of soils as most of them are existing paved or unpaved roadways. The majority of the soil associated with unpaved access roads would be 34.4 miles of prime farmlands (mostly located along the Sherwood Lateral) and 34.7 miles of soils with a potential for water erosion. Potential impacts associated with other soil limitations would be relatively minor, except for 2.0 miles of access roads that would cross soils identified to have a poor revegetation potential at various locations along all of the Rover pipeline components. Table 4.2.4-1 identifies soil limitations for both temporary and permanent access roads associated with the Rover Project. Shallow depth to bedrock would not be of concern, because no trenching would take place on the access roads. The majority of potential impacts on soils with limitations would be temporary, and the areas would be restored to pre-construction conditions following construction of the Rover Project. Only 4.0 miles of the total access road miles (73.7 miles) would be composed of new permanent access roads, resulting in a minimal permanent impact on the extent of new impervious surfaces in the general Project area. The Panhandle and Trunkline Projects would not require the use of new temporary or permanent construction roads. Information regarding site-specific justification for permanent access roads can be found in section 4.8 and appendix F.

TABLE 4.2.3-1

Summary of Soil Limitation Impacts for the Rover Pipeline Project Contractor Yards in Acres a

State / County	Acres Affected	Prime Farmland b	Hydric Soils	High Compaction Potential c	High Water Erosion Potential d	High Wind Erosion Potential e	Poor Revegetation Potential f
West Virginia							
Marshall	39.0	0.0	0.0	0.0	0.0	0.0	0.0
Tyler	18.0	17.9	4.4	0.0	7.1	0.0	0.0
West Virginia Subtotal	*56.9*	*17.9*	*4.4*	*0.0*	*7.1*	*0.0*	*0.0*
Ohio							
Ashland	21.3	14.2	1.5	0.0	3.6	0.0	0.0
Crawford	66.8	62.7	14.5	3.4	0.0	0.0	3.4
Defiance	23.7	23.7	4.2	23.7	0.0	0.0	4.2
Harrison	48.0	21.1	0.0	0.0	26.9	0.0	26.9
Jefferson	200.0	5.7	0.0	0.0	18.3	0.0	20.3
Monroe	8.6	7.9	0.0	0.0	0.0	0.0	0.0
Richland	23.0	21.9	0.0	0.0	4.6	0.0	0.0
Tuscarawas	83.4	36.7	12.3	0.0	22.3	0.0	24.9
Ohio Subtotal	*474.7*	*193.8*	*32.6*	*27.1*	*75.7*	*0.0*	*79.7*
Michigan							
Livingston	15.5	13.9	0.0	0.0	0.0	0.7	0.7
Monroe	43.5	1.5	41.4	0.0	0.0	2.1	0.0
Michigan Subtotal	*59.1*	*15.3*	*41.4*	*0.0*	*0.0*	*2.8*	*0.7*
Project Total	**590.7**	**227.1**	**78.4**	**27.1**	**82.8**	**2.8**	**80.4**

Source: USDA, 2014a

Note: No contractor yards are proposed in Pennsylvania. All impacts due to contractor yards would be temporary.

a Numbers are rounded to the tenths of a decimal for presentation purposes. Any mathematical discrepancies are due to rounding.

b Prime farmland soils includes both prime farmlands and farmlands of statewide importance, as designated by the NRCS. No farmlands of unique importance identified along the Project corridor.

c High Compaction Potential includes soils identified as clay loam or finer texture and somewhat poor, poor, or very poorly drained drainage class.

d High Water Erosion Potential includes soils with slopes > 5% and a K factor > 0.32 or if all slopes were identified as > 15% regardless of K factor.

e High Wind Erosion Potential for wind erodible soils include those with wind erodibility groups of 1 or 2.

f Poor Revegetation Potential reports soils with a poor revegetation potential for grasses.

TABLE 4.2.4-1

Summary of Soil Limitations Affected by the Rover Pipeline Project Access Roads (Miles) during Construction and Operation a

Facility	Prime Farmland b		Hydric Soils		Compaction Prone Soils c		High Water Erosion Potential d		High Wind Erosion Potential e		Poor Revegetation Potential f	
	Perm.	Temp.	Perm.	Temp.	Perm.	Temp.	Perm.	Temp	Perm	Temp	Perm.	Temp.
Supply Laterals												
Sherwood Lateral	1.5	11.8	0.0	0.0	0.0	0.0	1.7	13.6	0.0	0.0	0.2	0.0
CGT Lateral	0.1	1.3	0.0	0.0	0.0	0.0	0.2	2.9	0.0	0.0	0.0	0.0
Seneca Lateral	0.0	1.2	0.0	0.0	0.0	0.0	0.5	4.5	0.0	0.0	0.0	0.5
REX Interconnect	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Berne Lateral	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.0	0.0	0.0	0.2
Clarington Lateral	1.2	2.2	0.0	0.0	0.0	0.0	0.4	3.2	0.0	0.0	0.1	0.0
Majorsville Lateral	0.4	5.4	0.0	0.0	0.0	0.0	0.4	3.9	0.0	0.0	0.1	0.0
Cadiz Lateral	0.9	0.0	0.0	0.0	0.0	so	0.3	0.4	0.0	0.0	0.3	0.4
Burgettstown Lateral	0.3	1.4	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0
Mainline and Market Segments												
Mainlines A and B and Supply Connector	1.4	0.7	0.4	0.1	0.4	0.1	0.4	0.3	0.0	0.0	0.0	0.0
Market Segment	1.0	3.6	0.1	0.9	0.1	0.7	0.2	0.8	0.2	0.6	0.0	0.0
Total	**6.8**	**27.6**	**0.5**	**1.0**	**0.5**	**0.8**	**4.5**	**30.2**	**0.2**	**0.6**	**0.8**	**1.1**

Source: USDA, 2014a

Perm. = Permanent Effects; Temp. = Temporary Effects

a Numbers are rounded to the tenths of a decimal point for presentation purposes. Any mathematical discrepancies are due to rounding.

b Prime Farmland includes both prime farmlands and farmlands of statewide importance, as designated by the NRCS. No farmlands of unique importance were identified along the Project corridor.

c High Compaction Potential includes soils identified as having a clay loam or finer texture and a somewhat poor, poor, or very poorly drained drainage class.

d High Water Erosion Potential includes soils with slopes > 5% and a K factor > 0.32 and soils characterized by all slopes being > 15%, regardless of K factor.

e High Wind Erosion Potential for wind erodible soils include those with wind erodibility groups of 1 or 2.

f Poor Revegetation Potential reports soils with a poor revegetation potential for grasses.

4.2.5 General Impact and Mitigation

Construction activities such as clearing, grading, trench excavation, backfilling, and the movement of construction equipment along the rights-of-way would affect soil resources. Clearing removes protective cover and exposes the soil to the effects of wind and rain, which increases the potential for soil erosion and sedimentation of sensitive areas. Grading, spoil storage, and equipment traffic can compact soil, which reduces its porosity and increases runoff potential. Excess rock or fill material brought to the surface during trenching operations could hinder restoration of the rights-of-way.

To minimize soil erosion, Rover would follow BMPs that are outlined in its Plan and Procedures.[2] Rover's BMPs include temporary and permanent slope breakers, topsoil segregation, restoration of soil layering, restoration of surface contours, and revegetation using recommended seed mixes. Panhandle and Trunkline have adopted the FERC's Plan and Procedures and would use the BMPs specified in them to minimize erosion from wind and water during construction of its Projects.

Temporary erosion control devices would be installed prior to construction. These would be inspected regularly to determine whether repair or replacement is necessary and would only be removed following the successful revegetation of an affected area. Rover would also employ permanent erosion control devices such as installing trench breakers at the base of slopes near wetlands and slope breakers across the construction right-of-way where slopes are greater than 5 percent and within 50 feet of a wetland. The Panhandle and Trunkline Projects would not result in direct impacts on waterbodies or wetlands, and would install appropriate erosion control devices to prevent offsite erosion from occurring.

The movement of construction vehicles across the construction area could cause soil compaction. Potential impacts on compaction-prone soils would be mitigated by using methods described in Rover's Plan and state-specific AIMP (see appendix G). Soils with moderate moisture content would typically be more prone to compaction than dry soils. Impacts on compaction-prone soils would be mitigated through the use of timber or board mats through wetland areas. In agricultural and residential areas, Rover would employ topsoil segregation techniques and prevent the mixing of topsoil with subsoil and/or rock. Rover would test both the topsoil and subsoil for compaction at regular intervals. Soil identified to be compacted would be decompacted by deep tilling using a paraplow or similar method. Additionally, compaction tests would be conducted on undisturbed areas of the same soil type and conditions to approximate pre-construction soil compaction. In order to minimize impacts on agricultural lands, Rover has developed state-specific AIMPs for Ohio and Michigan. For agricultural lands in West Virginia and Pennsylvania, Rover would follow the standard upland construction measures described in its Plan. Following construction, agricultural practices within the pipeline rights-of-way would be allowed to resume. Rover would restore all disturbed agricultural areas associated with construction in accordance with its state-specific AIMPs and the Rover Plan. Typical mitigation measures include topsoil segregation, soil decompaction, and repair/replacement of irrigation and drainage structures damaged by construction (see table 4.8.1-3). Agricultural lands and specialty crops are discussed in more detail in sections 4.8.4 and 4.8.5.1, respectively. Impacts on and mitigation for prime farmlands and statewide important farmlands are discussed in section 4.2.2.6. Soil compaction at the Panhandle and Trunkline facilities would be mitigated generally through the use of timber mats and specifically by post-construction ripping of the soil in agricultural areas to decompact the soil as needed.

---

[2] Rover's application, including Rover's Project Specific Upland Erosion Control, Revegetation and Maintenance Plan and Rover's Project Specific Wetland and Waterbody Construction and Mitigation Procedures are available on the FERC's eLibrary website, located at http://ferc.gov/docs-filing/elibrary.asp, by searching Docket Number CP15-93-000.

In order to minimize and mitigate potential impacts on soils with poor revegetation potential, Rover would follow several procedures during construction, such as:

- restoring the rights-of-way with lime, fertilizer, and seed;
- selecting the proper seed mix using guidance from appropriate agencies and sources;
- preparing the seedbed to ensure effective seed application;
- using a seed drill equipped with a cultipacker or use of broadcast or hydroseeding methods at double the recommended seeding rate;
- using mulch including straw, hay, wood fiber hydromulch, erosion control fabric, or functional equivalent; and
- commencing cleanup following the backfilling of the trench, and completion of final grading, topsoil replacement, and installation of permanent erosion control within 20 days after backfilling of the trench. These operations would be completed within 10 days of backfilling of the trench in residential areas. In areas where dual pipelines would be installed, Rover would complete these operations within 20 days of backfilling the most recently disturbed trench.

The Panhandle and Trunkline Projects would use NRCS seed mix and soil enhancement recommendations to ensure revegetation post-construction. Soils considered to have a poor to moderate revegetation potential would receive soil amendments to aid the revegetation process.

In areas of shallow depth to bedrock, Rover would employ subsoil protection techniques. These techniques may include using rock to backfill the trench only up to the top of the existing bedrock profile and only using rocks of 4 inches or less. In agricultural and residential areas, Rover would segregate the topsoil and remove excess rock from the top 12 inches of topsoil. The Panhandle and Trunkline Projects would not affect soils with a shallow depth to bedrock.

Hydric soils are most often associated with wetlands. Rover plans to employ the following BMPs and techniques when crossing wetlands. Additional information and details can be found in Rover's Procedures, and our discussion in sections 2.3.2.1 and 4.4.2 of this EIS. To protect and minimize impacts on wetlands, Rover would:

- limit the typical workspace of single pipeline installation to 75 feet wide in wetlands;
- limit the typical workspace for dual pipeline installations to 95 feet wide in wetlands;
- limit equipment operation to those necessary for construction of the pipeline;
- minimize the clearing of vegetation and removal of stumps;
- stabilize upland areas and assemble the pipeline outside of saturated wetlands;
- minimize the amount of time the trench is open and that topsoil is segregated;
- avoid using soil from outside of the wetland, rocks, stumps, or brush to fill the trench; and
- inspect the right-of-way periodically both during and after construction as well as make repairs to erosion control devices and restoration features.

Panhandle and Trunkline would use the BMPs provided in the FERC's Plan and Procedures to mitigate any affects construction of these Projects would have on hydric soils. In addition, timber mats would be used to prevent rutting and compaction of the soils, where appropriate.

Potential impacts on agricultural and prime farmlands would be minimized by implementing the BMPs that are provided in Rover's AIMPs for Ohio and Michigan and the general methods in Rover's Plan for Pennsylvania and West Virginia. During construction of the Panhandle and Trunkline Projects, topsoil would be segregated in areas of cultivated or rotated croplands, pasture, residential areas, hay fields, and at the request of a landowner or land management agency. Upon completion of construction, the segregated topsoil would be returned to the disturbed area.

Rover would use mitigation methods including topsoil segregation, stone removal, and compliance with re-seeding recommendations. Rover would also compensate landowners for damages caused on or off the right-of-way by construction activities. Rover would mitigate for impacts on agricultural lands by use of the following measures:

- employment of Agricultural Inspector/Drainage Specialists for monitoring specific to each part of Project construction;
- repair of any impacts on subsurface drains;
- segregation of at least 12 inches of topsoil, removal of rock greater than 4 inches, and subsoil decompaction by ripping to a depth of at least 18 inches;
- prevention of soil erosion and restoration of soil conservation practices after the completion of construction;
- burial of the pipe to at least 48 inches in agricultural and pasture land and to at least 60 inches where the pipeline would cross surface drains, diversions, grassed waterways, open ditches, and streams;
- landowner compensation for lost production and/or crop damages; and
- if crop yields in restored areas are not similar to or greater than those on adjacent undisturbed croplands, Rover would develop and implement restoration measures in conjunction with appropriate agency personnel and landowners.

In agricultural areas where soils become saturated before topsoil segregation occurs, the AI would either stop work or allow construction to proceed as long as rutting does not cause a mixing of the topsoil and subsoil. In areas where rutting would mix the top soil with subsoil, other measures would be used such as the use of mats, low ground weight equipment, dewatering with portable pumps, and disking to enhance evaporation. We further discuss impacts on agricultural land in section 4.8.4.

Topsoil is the uppermost layer of soil, typically has the highest concentration of organic materials, and generally has greater biological productivity than subsurface soils. The micro-organisms and other biological material typically found in topsoil provide necessary nutrients to vegetation. It also has the highest concentration of plant root and seeds. Topsoil preservation is important especially for restoration of natural vegetation and cropland, especially in areas where topsoil is limited in extent or depth. Topsoil would be segregated across the width of the construction workspace in agricultural areas, including improved pastures, residential areas, and in areas where requested by the landowner. In unsaturated wetlands, up to 12 inches of topsoil would be segregated over the pipeline trench. Topsoil segregation would not be possible in wetlands with saturated soils or standing water.

Topsoil would be removed to a minimum depth of 12 inches or the total depth of topsoil if less than 12 inches. Topsoil would be stockpiled in a manner that prevents mixing with subsurface soil. Silt fences and other barriers would be installed to prevent erosion and siltation from the stockpiles from migrating into nearby wetlands and waterbodies.

The Panhandle and Trunkline Projects would segregate topsoil in areas of cultivated or rotated croplands, pasture, residential areas, hay fields, and at the request of landowner or land management agency. Upon completion of construction, the segregated topsoil would be returned to the disturbed area.

4.2.6 Conclusions

Construction activities associated with the Projects could adversely affect soil resources by causing erosion, compaction, and introduction of excess rock or fill material to the surface, which could hinder restoration. However, the applicants would implement the mitigation measures contained in Rover's Plan and CMPs (Rover) and the FERC's Plan (Panhandle and Trunkline) to control erosion, enhance successful revegetation, and minimize any potential adverse impacts on soil resources. Specifically, soil impacts would be mitigated through measures such as topsoil segregation, temporary and permanent erosion controls, and post-construction restoration and revegetation of construction work areas. Additionally, Rover would implement its Spill Procedures and state-specific AIMPs during construction and operation to prevent, and if necessary, contain and clean up, accidental spills of any material that may contaminate soils. Panhandle and Trunkline would follow the procedures put forth in its Spill Prevention and Response Plan (SPAR Plan).

Impacts of Rover's Project during post-construction operations are expected to be minimal. Permanent impacts from the Rover Project would occur as a result of the conversion of non-industrial land use to industrial land use at aboveground facilities for operational purposes. However, as no additional ground would be excavated during operation of Rover's aboveground facilities, no impacts are expected during operations. Impacts on soils from the Panhandle and Trunkline Projects are expected to be minimal due to construction consisting of modifications to existing facilities and the implementation of the BMPs and procedures in the FERC's Plan and Procedures.

Based on the overall soil conditions present in the Projects' area(s) and the applicants' proposed construction and operation methods, we conclude that construction and operation of the Projects would not significantly alter the soils of the region.

4.3 WATER RESOURCES

The Rover Project would include construction and operation of new aboveground and pipeline facilities in four states: Pennsylvania, West Virginia, Ohio, and Michigan. The Panhandle Project would include modifications and upgrades at existing aboveground facilities in Illinois, Indiana, Ohio, and Michigan. The Trunkline Project would include modifications and upgrades at existing aboveground facilities in Mississippi, Tennessee, and Illinois.

4.3.1 Groundwater Resources

4.3.1.1 Existing Groundwater Resources

The USGS defines an aquifer as a formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to yield significant quantities of water to wells and springs (USGS, 2015b). The primary water-yielding aquifers, or principal aquifers, in the Projects' area(s) can be grouped into four types: sand and gravel aquifers, sandstone aquifers, carbonate-rock aquifers, and sand and carbonate-rock aquifers. Sand and gravel aquifers are the shallowest type of principal aquifer. Unconsolidated sand and gravel aquifers of alluvial origin underlie portions of the Trunkline Project area (USGS, 2015b). Sandstone aquifers have relatively lower transmitting capacity when compared to unconsolidated sand and gravel aquifers but extend over large, regional areas of the United States, including portions of the Rover Project area (USGS, 2003b, 2015b). Most carbonate-rock aquifers consist of limestone and are susceptible to dissolution by slightly acidic groundwater (USGS, 2015b). Carbonate-rock aquifers underlie parts of the Rover and Panhandle Projects (USGS, 2003b). Interbedded sandstone and carbonate-rock aquifers consist of carbonate rocks interbedded with almost equal amounts of water-yielding sandstone (USGS, 2015b); this aquifer type underlies parts of the Projects' area(s) (USGS, 2003b). Portions of all of the Projects would also be underlain by rocks classified as 'other' by the USGS. These include areas that are designated as a 'minor aquifer' or 'not a principal aquifer.' These areas are characterized by low permeability deposits and rocks, thick unsaturated zones, or aquifers that supply little water (USGS, 2015b).

Pennsylvania

Groundwater resources that underlie the Rover Project area in Pennsylvania originate from Pennsylvanian-age sandstone aquifers (USGS, 2003b). These aquifers generally run northeast/southwest and underlie most of western Pennsylvania, the eastern half of Ohio, and the entire northernmost and western portions of West Virginia. These aquifers are also present throughout central Michigan (USGS, 2003b). In Pennsylvania, these aquifers typically yield between 5 and 60 gpm but can exceed yields of 600 gpm (PSU, 2007). The depth to groundwater in this area is generally less than 100 feet, and in some areas, less than 40 feet (Battelle, 2013). Table 4.3.1-1 lists the principal aquifers in Pennsylvania that would be crossed by the Projects.

More than half of the groundwater pumped from aquifers in Pennsylvania is used for public consumption (PSU, 2007). In Washington County, geologic aquifer formations that are generally within 300 feet of the ground surface serve as drinking water resources (Battelle, 2013). In 2010, the majority of groundwater withdrawals made in Washington County were used for domestic supply, livestock, and mining activities (USGS, 2015c).

West Virginia

Groundwater resources in the Rover Project area within West Virginia also originate from Pennsylvanian-age sandstone aquifers (USGS, 2003b). In West Virginia, these aquifers can yield from 5 to 400 gpm. Coal seams can also yield water in this region and in the surrounding states with large coal deposits (Battelle, 2013; Trapp and Horn, 1997). The chemical quality of the upper, freshwater portions of these aquifers is generally suitable, or can be treated to become suitable, for municipal supplies and other purposes (Trapp and Horn, 1997). Table 4.3.1-1 lists the principal aquifers in West Virginia that would be crossed by the Projects.

The Sherwood Lateral and Majorsville Lateral would cross a surficial aquifer that runs adjacent to the Ohio River. Surficial aquifers are shallow aquifers that are typically less than 50 feet below the ground's surface. Surficial aquifers near major rivers and streams yield nearly two orders of magnitude more water than those aquifers found deeper below the ground's surface (Battelle, 2013). Potential well yields along this surficial aquifer range from 100 to 1,000 gpm. Yields from wells that are bored or excavated horizontally can be greater than 1,000 gpm (Trapp and Horn, 1997). No other surficial aquifers in West Virginia would be crossed by the Projects.

More than 50 percent of West Virginia's overall population, and more than 90 percent of its rural population, depend on groundwater for drinking water supplies (WVDEP, 2014a). In 2010, the primary uses for groundwater state-wide were for industry, public supply, and domestic supply (USGS, 2015c).

TABLE 4.3.1-1

Principal Aquifers Crossed by the Rover Pipeline Project

Project Component a	State(s)	Aquifer Type	Start MP	End MP	Average Yield (gpm)
Berne Lateral	OH	Pennsylvanian-age sandstone	0.0	4.2	15
Burgettstown Lateral	PA, WV, OH	Pennsylvanian-age sandstone	0.0	51.7	15
Cadiz Lateral	OH	Pennsylvanian-age sandstone	0.0	3.4	15
CGT Lateral	WV	Pennsylvanian-age sandstone	0.0	5.7	15
Clarington Lateral	OH	Pennsylvanian-age sandstone	0.0	32.9	15
Mainlines A and B	OH	Pennsylvanian-age sandstone	18.6	58.2	15
		Mississippian-age sandstone and carbonate-rock	58.2	116.4	15
		Other b	116.4	122.6	N/A
		Silurian-Devonian-age carbonate-rock	122.6	200.3	100-500
		Other b	200.3	209.6	N/A
Majorsville Lateral	WV, OH	Pennsylvanian-age sandstone	0.0	23.8	15
Market Segment	OH, MI	Other b	0.0	61.1	N/A
		Mississippian-age sandstone and carbonate-rock	61.1	65.3	15
		Other b	65.3	72.6	N/A
		Mississippian-age sandstone and carbonate-rock	72.6	78.6	15
		Other b	78.6	79.8	N/A
		Mississippian-age sandstone and carbonate-rock	79.8	80.1	15
		Other b	80.1	87.9	N/A
		Mississippian-age sandstone and carbonate-rock	87.9	99.4	15
		Other b	99.4	100.0	N/A
Seneca Lateral	OH	Pennsylvanian-age sandstone	0.0	25.7	15
Sherwood Lateral	WV, OH	Pennsylvanian-age sandstone	0.0	54.0	15

Sources: Lush et al., 2006; OHEPA, 2012; PSU, 2007; Trapp and Horn, 1997; USGS, 1992, 1995, 2003b.

N/A - Not Applicable

a Rover's aboveground facilities are located along the pipeline corridor, and the resources crossed would be the same. Therefore, aboveground facilities are not included in this table.

b "Other" aquifer types include aquifers designated by the USGS as a "minor aquifer," "not a principal aquifer," or a "confining unit."

Ohio

Groundwater resources in Ohio include the Pennsylvanian-age sandstone aquifers, Mississippian-age sandstone and carbonate-rock aquifers, and Silurian-Devonian-age carbonate-rock aquifers. In addition, portions of Projects' area(s) within Ohio would overlie rocks designated as "other" (USGS, 2003b). Tables 4.3.1-1 and 4.3.1-2 list the principal aquifers in Ohio that would be crossed by the Projects.

TABLE 4.3.1-2

Principal Aquifers Crossed by the Panhandle and Trunkline Backhaul Projects

Project Component	County, State	Aquifer Type	Average Yield (gpm)
PANHANDLE BACKHAUL PROJECT			
Edgerton 10 Gate	Lenawee, MI	Other **a**	N/A
Edgerton Compressor Station	Allen, IN	Silurian-Devonian-age carbonate rock	5 - 15
Montezuma Compressor Station	Parke, IN	Other **a**	N/A
Panhandle-Rover Interconnect	Defiance, OH	Other **a**	N/A
Tuscola 6 Gate	Vermillion, IN	Other **a**	10
Tuscola Compressor Station	Douglas, IL	Mississippian-age sandstone and carbonate rock	10
Zionsville 3 Gate	Hamilton, IN	Silurian-Devonian-age carbonate rock	5 - 15
Zionsville Compressor Station	Marion, IN	Other **a**	N/A
TRUNKLINE BACKHAUL PROJECT			
Bourbon Meter Station	Douglas, IL	Other **a**	N/A
Dyersburg Compressor Station	Dyer, TN	Mississippi embayment system sand and gravel	200 – 1,000
Independence Compressor Station	Tate, MS	Mississippi embayment system sand and gravel	100 - 300
Johnsonville Compressor Station	Wayne, IL	Other **a**	N/A
Joppa Compressor Station	Massac, IL	Mississippi embayment system sand and gravel	50 - 500
Panhandle-Trunkline Interconnect	Douglas, IL	Mississippian sandstone and carbonate rock	10

Sources: USGS, 1992; USGS, 1995; USGS, 1998; USGS, 2003b
N/A - Not applicable
a "Other" aquifer types include aquifers designated by the USGS as a "minor aquifer," "not a principal aquifer," or a "confining unit."

Pennsylvanian-age sandstone aquifers underlie the eastern half of the state of Ohio (USGS, 2003b). In this area, these aquifers are approximately 500 feet thick (USGS, 1995). Mississippian-age sandstone and carbonate rock aquifers generally run in a north to south direction through the center of the state of Ohio (USGS, 2003b). In Ohio, rocks that make up the Mississippian-age sandstone and carbonate rock aquifers range in thickness from 500 to 1,000 feet. Both the Pennsylvanian and Mississippian aquifers consist mostly of limestone and sandstone (USGS, 1995). Typical yield for these aquifers is approximately 15 gpm, but some of the thicker water-bearing units can yield from 50 to 100 gpm. In southeast Ohio, sandstone aquifers contain large amounts of shale deposits, which can limit well production potential to 5 gpm.

Silurian-Devonian-age carbonate rock aquifers, which underlie the majority of Ohio, are composed primarily of dolomites and limestone (USGS, 1995). Depth to the top of these aquifers in Ohio ranges from less than 100 feet to more than 400 feet below the ground's surface (USGS, 1995). Carbonate aquifers in western Ohio can yield from 100 to 500 gpm. Higher yields occur in areas that are fractured or have karst terrain (OHEPA, 2012).

A sand and gravel surficial aquifer system, typically associated with buried valley aquifers, is present throughout Ohio and is crossed by the Rover Project in the eastern part of the state. This surficial aquifer system is primarily of glacial origin and contains Ohio's most productive water-bearing formations (USGS, 1995; OHEPA, 2014a). It is composed of unconsolidated deposits at or near the land's surface and alluvium deposited along present or buried stream and river channels. The majority of deposits in this system are less than 100 feet thick, but they can be up to 600 feet thick. Water production from individual wells constructed in these aquifers in Ohio vary, but yields of 100 gpm or less are most common (OHEPA, 2014a; OHDNR, 2015b). Wells with the highest yields are completed along waterbodies and in outwash plains. This system accounts for more than 50 percent of the groundwater withdrawn in Ohio (USGS, 1995). Depth to the water table could be less than 10 feet below the ground's surface in these areas (NRCS, 2015).

The quality of water obtained from these aquifers within the Project area is generally adequate or can be treated and made adequate for most uses (USGS, 1995). Nearly half of Ohio's residents, businesses, and industries rely on groundwater as their primary source of drinking water (OHEPA, 2014b). In 2010, the primary uses for groundwater state-wide were for public supply, industry, and domestic supply (USGS, 2015c).

Michigan

Groundwater resources in the Projects' area(s) within Michigan are derived from Mississippian-age sandstone and carbonate rock aquifers as well as rocks designated as "other" by the USGS (USGS, 1992). The sandstone and carbonate rock aquifers are some of the most productive aquifers in Michigan with yields in the Projects' area(s) ranging from 70 to more than 1,400 gpm. Much of the water contained within these aquifers is saline, but the majority of the portion that would underlie the Projects contains freshwater. Primary uses for groundwater derived from these aquifers in Michigan are for industry and public supply.

Surficial aquifers formed by glaciofluvial or meltwater deposits are located throughout Michigan. They are exposed at land surface and are readily recharged by infiltrating precipitation. These surficial aquifers store and transmit water to hydraulically connected lower bedrock aquifers and discharge water to local streams and rivers. Glacial aquifers are the most abundant and widespread source of well water in Michigan and surrounding states (USGS, 1992). These aquifers have a broad range of yields, from 10 to 1,400 gpm, with yields between 200 and 500 gpm being the most common (Lusch, no date). The primary uses for groundwater in 2010 that would underlie the Projects were for domestic and public supply and industry (USGS, 2015c). The Mississippian aquifer is generally overlain by and hydraulically connected with this surficial aquifer system, and as such, recharge to the Mississippian aquifer is through infiltration (downward leakage) from the surficial aquifer system to the Mississippian bedrock aquifer. Tables 4.3.1-1 and 4.3.1-2 list the principal aquifers in Michigan that would be crossed by the Projects.

Illinois

The Projects' area(s) in Illinois are underlain by the Mississippian aquifer, the Mississippi embayment sand and gravel aquifer system, and "other" rock types (USGS, 2003b), as well as a large surficial aquifer system (USGS, 1995). Table 4.3.1-2 list the principal aquifers in Illinois that would underlie the Projects.

The Mississippian aquifer is located in the western and east-central parts of Illinois. In this area, the aquifer is overlain by thick rock deposits that act as confining units that impede downward movement of freshwater into the aquifers. This aquifer is typically only used for groundwater supplies in areas where it is less than 200 feet below the land surface (USGS, 1995).

The Mississippi embayment aquifer system consists of six aquifers made up of poorly consolidated to unconsolidated, sand, silt, and clay (USGS, 1998). This system is a major source of freshwater for the area it underlies. The McNairy-Nacatoch aquifer is part of this system and underlies the Joppa Compressor Station component of the Trunkline Project in Massac County, Illinois. Of the aquifers that make up the Mississippi embayment aquifer system, the McNairy-Nacatoch aquifer is among the most widely used for water supply. It is located at depths from less than 50 feet to more than 400 feet below the ground's surface. The primary source of recharge to this aquifer is from precipitation on outcrop areas. Wells in the McNairy-Nacatoch aquifer commonly yield from 500 to 1,000 gpm, and the water is generally suitable for most uses (USGS, 1995). In 2010, residents of Massac County reported using groundwater for public and domestic supply, industry, thermoelectric power generation, livestock, and irrigation, with irrigation and industry being the most common uses (USGS, 2015c).

The same surficial sand and gravel aquifer system that underlies the majority of Ohio and Indiana also underlies almost the entire state of Illinois (Massac County, Illinois is not underlain by a surficial aquifer). Within the Projects' area(s), this system ranges in thickness from less than 100 up to 600 feet, and individual wells typically do not have the potential to yield more than 500 gpm (USGS, 1995).

In Illinois, groundwater is commonly used for public supply, domestic supply, irrigation, and livestock. In Wayne County, Illinois, where the Johnsonville Compressor Station is located, the mining industry is a large user of groundwater supplies. In Massac County, Illinois, where the Joppa Compressor Station is located, groundwater is also widely used by general industry and for thermoelectric power generation (USGS, 2015c). Depth to the water table within the Projects' area(s) could occur at depths of less than 10 feet (NRCS, 2015).

Indiana

Groundwater resources in the Panhandle Project area of Indiana are derived from the Silurian-Devonian aquifer. Portions of the Project overlie areas designated as "other" by the USGS (USGS, 1995; 2003b). Depth to the Silurian-Devonian aquifer system in this area ranges from 100 to more than 400 feet below the ground's surface. Water obtained from the portion of the aquifer system in this state generally have high levels of total dissolved solids and iron, which can exceed the EPA secondary drinking water standards. However, with the exception of use as drinking water in certain areas, the water is generally adequate, or can be treated to become adequate, for most purposes (USGS, 1995). Table 4.3.1-2 lists the principal aquifers in Indiana that underlie the Panhandle Project components.

Panhandle's Tuscola valve site and Montezuma Compressor Station are located over surficial aquifers (USGS, 1995). In 2010, the majority of groundwater withdrawn in Indiana was used for public supply. Groundwater in the state is also commonly used for domestic supply, irrigation, industry, and livestock (USGS, 2015c). Depth to the water table could occur at depths of less than 10 feet within the Indiana Project area (NRCS, 2015).

Tennessee

The Trunkline Project area in Tennessee overlies the Mississippi embayment aquifer system (USGS, 2003b). The middle Claiborne aquifer is a major source of groundwater in western Tennessee and is the most widely used aquifer within the Mississippi embayment aquifer system (USGS, 1995, 1998). Thickness of the middle Claiborne aquifer in the Trunkline Project area is greater than 200 feet. The quality of groundwater drawn from the Mississippi embayment aquifer system in this area is generally suitable for most uses (USGS, 1995). Table 4.3.1-2 lists the principal aquifer in Tennessee that underlie the Trunkline Project component.

The Mississippi embayment aquifer system is overlain by the Mississippi River Valley alluvial aquifer in this area. This surficial aquifer is present only along the Mississippi River. It consists of sediments that range from clay to coarse gravel and reaches a maximum thickness of about 100 feet. The Mississippi River Valley alluvial aquifer can produce wells that yield several thousand gpm (USGS, 1995). In 2010, Dyer County, Tennessee groundwater withdrawals were primarily used for irrigation and public supply (USGS, 2015c). Depth to the water table could occur at a depth of less than 10 feet in the Tennessee Project area (NRCS, 2015).

Mississippi

The Trunkline Project area in Mississippi also overlies the Mississippi embayment aquifer system (USGS, 2003b). In Tate County, Mississippi, where the Independence Compressor Station is located, this system is approximately 2,000 feet thick. The Middle Claiborne aquifer is part of the Mississippi embayment aquifer system and is widely used for groundwater supplies. This aquifer has a thickness of approximately 200 feet in this area. The Trunkline Project does not overlie a surficial aquifer in this state (USGS, 1998). Table 4.3.1-2 lists the principal aquifer in Mississippi that underlies the compressor station.

Groundwater is an important source of water for people living in Mississippi (USGS, 1998). In 2010, the majority of groundwater withdrawals made in Tate County were used for irrigation, public supply, and domestic supply (USGS, 2015c). The depth to the water table in the Trunkline Project area in Mississippi could occur less than 10 feet below the ground's surface (NRCS, 2015).

4.3.1.2 Sole Source Aquifers

The EPA defines a sole source aquifer (SSA) or principal source aquifer area as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. The EPA guidelines also stipulate that these areas can have no alternative drinking water source(s) that could physically, legally, and economically supply all those who depend upon the aquifer for drinking water (EPA, 2012b). Based on a review of the EPA's designated SSA mapping, none of the Projects would cross any designated SSAs (EPA, 2007). The closest SSA to the Projects is the Pleasant City Aquifer, which is more than 10 miles from the Rover Project.

4.3.1.3 State-designated Aquifers

In addition to the EPA's SSA program, individual states may enact regulations protecting significant aquifer recharge areas, critical areas where excessive use of groundwater poses a threat to the long-term integrity of a water-supply source, or preservation areas to protect natural resources including public water supply sources. Currently, no state-designated aquifers have been identified in the Projects' area(s) (Meredith et al., 2001; MIDEQ, 2015a; OHEPA, 2015a; PADCNR, 2015a; WVDEP, 2015a).

4.3.1.4 Wellhead and Aquifer Protection Areas

Under the Safe Drinking Water Act (SDWA), as amended in 1986, each state is required to develop and implement a Wellhead Protection Program (WHPP) in order to identify the land and recharge areas contributing to public supply wells, and prevent the contamination of drinking water supplies. The SDWA also requires the development of a broader-based Source Water Assessment Program (SWAP), which includes the assessment of potential contamination to both groundwater and surface water through a watershed approach. Twenty wellhead protection areas (WHPA) would be crossed by the Rover Project (see table 4.3.1-3). The Panhandle and Trunkline Projects would not overlie any WHPAs.

TABLE 4.3.1-3

Wellhead Protection Areas Crossed by the Rover Pipeline Project

Project Facility	County, State	Crossing Location (MP) a	Protected Water Supply
Burgettstown Lateral	Washington, PA	0.0	Cherry Valley Reservoir/ Pennsylvania-American Water Company
Mainline A	Defiance, OH	204.2	Jewell Café
Mainlines A and B	Ashland, OH	82.2	Jeromesville Village
Mainlines A and B	Ashland, OH	87.3	Ashland County Service Center
Mainlines A and B	Crawford, OH	126.0	The Oak's Cafe
Mainlines A and B	Richland, OH	101.1	Five Points Country Market Public Water Supply
Mainlines A and B	Seneca, OH	130.8	Bloomville Village Public Water Supply/ Republic Village/Melmore United Methodist Church
Mainlines A and B	Tuscarawas, OH	36.5	TCMSD-Wilkshire Hills Public Water Supply
Mainlines A and B (MLV-04)	Tuscarawas, OH	36.8	TCMSD-Wilkshire Hills Public Water Supply
Majorsville Lateral	Marshall, WV	11.5	McMechen Municipal Water Supply
Market Segment	Lenawee, MI	42.5	Grand Court Adrian
Market Segment	Lenawee, MI	42.8	Adrian (Well 1-4)
Market Segment	Lenawee, MI	43.1	Farm Credit Associates
Market Segment	Lenawee, MI	43.1	Merrillat Industries
Market Segment	Livingston, MI	86.1	Step by Step Early Learning Center
Market Segment	Livingston, MI	86.4	Pinckney - Dells Well 1
Market Segment	Livingston, MI	87.4	Pinckney Elementary School
Whitmore Lake Contractor Yard	Livingston, MI	N/A	20th Century Building Company
Whitmore Lake Contractor Yard	Livingston, MI	N/A	Go Getters LLC - Always Unique Childcare
Whitmore Lake Contractor Yard	Livingston, MI	N/A	WJ Maxey Boys Training School

Sources: MIDTMB, 2015; OHEPA, 2015a; PADEP, 2004b; WVDHHR, 2015b

MLV – mainline valve

N/A – Not applicable

TCMSD – Tuscarawas County Metropolitan Sewer District

a Project milepost at which the Project facility would first enter the WHPA.

Pennsylvania

Pennsylvania's WHPP is a comprehensive program designed to protect a well, spring, or infiltration gallery used by a public water system from contamination. Responsibilities for the state's WHPP are shared among many stakeholders, including public water suppliers, state and local government, landowners, facility operators, local agencies, and the public (PADEP, 2002). WHPAs in the state are divided into three zones. Zone 1 is the protective zone immediately surrounding a well, spring, or infiltration gallery with a 100- to 400-foot radius, depending on site-specific source and aquifer characteristics. Zone II is the zone encompassing the portion of the aquifer through which water is diverted to a well or flows to a spring or infiltration gallery. Zone II is a 0.5-mile radius around the source, unless a more detailed delineation is approved. Zone III is the zone beyond Zone II that contributes surface water and groundwater to Zones I and II (Pennsylvania Code, 2009). The Rover Project would cross one WHPA in Pennsylvania (see table 4.3.1-3).

One public water supplier (the Pennsylvania-American Water Company) was identified within the Rover Project area for this state (see table 4.3.1-3). Rover contacted the company regarding any delineated or approved WHPAs at the supplier's location, but to date the company has not responded. Therefore, to be conservative, a Zone II WHPA was assumed around the site. There are no recorded public wells within 0.5 mile of the Rover Project in Pennsylvania; therefore, we have assumed that there are no Zone I or Zone II WHPAs that would be crossed (with the exception of the previously mentioned Zone II WHPA associated with the Pennsylvania-American Water Company). There is one public water well located about 8 miles to the southeast of the Burgettstown Lateral in Pennsylvania. Based on the location of this well, and the fact that it is within the same HUC-12 watershed as the Rover Project, we assumed that the area between MPs BGL 0.0 and BGL 4.2 is located within a Zone III WHPA.

West Virginia

The West Virginia WHPP consists of three major parts: delineating a wellhead area from which water could flow to the source within a 5-year time of travel; conducting a survey of past and present activities performed on all properties within the WHPA to identify potential sources of contamination; and developing and implementing long- and short-term drinking water replacement strategies as well as plans to reduce or eliminate potential threats (WVDHHR, 2015b). One WHPA would be crossed by the Rover Project, specifically the Majorsville Lateral, in West Virginia (see table 4.3.1-3) (WVDHHR, 2015a).

Ohio

Ohio's SWAP program is designed to reduce a community's water costs and better ensure a safe and high quality supply of drinking water by taking steps to avoid chemical spills in the areas surrounding a wellfield or upstream from a surface water intake. The designation of WHPAs, or Drinking Water Protection Areas as they are called in Ohio, is done through an assessment of the area around the well or intake that will be protected, creating an inventory of all the facilities or activities within the area that could potentially cause contamination, performing a contamination susceptibility analysis, and creating a plan outlining activities to protect the SWAP area (OHEPA, 2015a). In Ohio, eight WHPAs would be crossed by Mainlines A and B and one would be crossed by Mainline A only (see table 4.3.1-3).

Michigan

In Michigan, WHPAs are delineated based on a 10-year time of travel model that estimates how long it would take a particle of water to travel through the WHPA and into a well. WHPA delineations are submitted for approval to the Michigan Department of Environmental Quality (MIDEQ, 2006a). Ten WHPAs would be crossed by the Rover Project in Michigan; seven would be crossed by the Market

Segment, and three are within the Whitmore Lake Contractor Yard site (MIDTMB, 2015) (see table 4.3.1-3).

4.3.1.5 Water Supply Wells and Springs

According to information obtained during field surveys as well as publicly available geospatial data, 119 public or private water supply wells would be within 150 feet of the Rover Project (USGS, 2015d). It is West Virginia state policy that the locations of public and private wells is not made available to the public; therefore, wells within 150 feet of the Project in West Virginia were identified by Rover exclusively during field surveys (WVDHHR, 2015b). Table 4.3.1-4 lists wells within 150 feet of the Rover Project by milepost and Project component. There are no wells within 150 feet of the Panhandle or Trunkline Projects, and there were no springs identified within 150 feet of any of the three Projects' area(s).

TABLE 4.3.1-4

Water Supply Wells Within 150 Feet of the Proposed Rover Project

Project Component	County, State	Approximate Milepost	Distance from Centerline (feet)	Direction from Construction	Type
Supply Laterals					
Berne Lateral	Noble, OH	2.5	14	North	Domestic
	Noble, OH	2.5	47	North	Domestic
Burgettstown Lateral	Washington, PA	1.0	113	East	Unknown
	Washington, PA	1.0	108	East	Unknown
	Washington, PA	1.0	114	East	Unknown
	Washington, PA	1.0	108	East	Unknown
	Jefferson, OH	19.0	52	South	Unknown
	Jefferson, OH	19.0	90	South	Unknown
	Jefferson, OH	19.0	45	South	Unknown
	Jefferson, OH	19.0	82	South	Domestic
	Jefferson, OH	20.2	76	North	Unknown
	Jefferson, OH	26.8	105	North	Unknown
	Jefferson, OH	30.3	104	North	Domestic
	Jefferson, OH	30.3	105	North	Domestic
Cadiz Lateral	None Identified				
CGT Lateral	Doddridge, WV	5.8	49	South	Unknown
Clarington Lateral	Monroe, OH	0.5	62	East	Domestic
	Belmont, OH	2.0	62	West	Domestic
	Belmont, OH	7.9	198	East	Domestic
	Belmont, OH	8.0	144	East	Domestic
	Belmont, OH	8.5	175	East	Domestic
	Belmont, OH	8.5	177	East	Domestic
	Belmont, OH	8.5	175	East	Domestic
	Belmont, OH	8.5	176	East	Domestic
	Belmont, OH	11.3	183	East	Domestic

TABLE 4.3.1-4 (continued)

Water Supply Wells Within 150 Feet of the Proposed Rover Project

Project Component	County, State	Approximate Milepost	Distance from Centerline (feet)	Direction from Construction	Type
Majorsville Lateral	Marshall, WV	1.6	41	South	Domestic
	Marshall, WV	4.5	7	North	Domestic
	Marshall, WV	7.6	25	South	Domestic
	Marshall, WV	11.5	40	South	Unknown
Seneca Lateral	Noble, OH	1.2	27	North	Domestic
	Noble, OH	1.2	6	South	Domestic
	Monroe, OH	3.7	129	North	Domestic
	Monroe, OH	8.3	89	South	Domestic
	Monroe, OH	9.9	221	North	Domestic
	Monroe, OH	11.2	147	North	Domestic
	Monroe, OH	14.4	4	North	Domestic
Sherwood Lateral	Tyler, WV	17.6	121	East	Domestic
	Tyler, WV	30.8	184	East	Domestic
	Tyler, WV	30.8	179	East	Domestic
	Tyler, WV	30.8	186	East	Domestic
	Tyler, WV	30.8	181	East	Domestic
	Monroe, OH	40.7	92	West	Domestic
	Monroe, OH	40.7	97	West	Domestic
	Monroe, OH	40.7	97	West	Domestic
	Monroe, OH	40.7	92	West	Domestic
Supply Connectors A and B	Harrison, OH	1.6	221	West	Domestic
	Harrison, OH	9.2	42	East	Domestic
	Harrison, OH	9.2	39	East	Domestic
	Harrison, OH	9.2	47	East	Domestic
	Harrison, OH	9.2	45	East	Domestic
	Harrison, OH	9.3	60	West	Domestic
	Harrison, OH	9.3	56	West	Domestic
	Harrison, OH	9.3	61	West	Domestic
	Harrison, OH	9.3	57	West	Domestic
	Harrison, OH	13.2	165	West	Domestic
Mainlines					
Mainlines A and B	Carroll, OH	22.3	63	West	Domestic
	Carroll, OH	22.4	243	West	Domestic
	Wayne, OH	55.4	144	North	Domestic
	Wayne, OH	58.7	124	North	Domestic
	Wayne, OH	69.3	66	North	Domestic
	Wayne, OH	69.3	72	North	Domestic
	Wayne, OH	69.3	74	North	Domestic
	Wayne, OH	69.3	67	North	Domestic
	Crawford, OH	118.3	177	North	Domestic

TABLE 4.3.1-4 (continued)					
Water Supply Wells Within 150 Feet of the Proposed Rover Project					
Project Component	**County, State**	**Approximate Milepost**	**Distance from Centerline (feet)**	**Direction from Construction**	**Type**
	Seneca, OH	142.5	221	North	Domestic
	Seneca, OH	148.0	225	North	Domestic
	Wood, OH	182.5	199	South	Domestic
	Henry, OH	185.6	194	North	Domestic
Market Segment					
	Fulton, OH	11.9	147	North	Domestic
	Lenawee, MI	36.0	133	East	Domestic
	Lenawee, MI	37.5	11	West	Domestic
	Lenawee, MI	47.3	33	West	Domestic
	Lenawee, MI	48.0	56	West	Domestic
	Lenawee, MI	48.1	96	West	Domestic
	Lenawee, MI	55.0	80	West	Domestic
	Lenawee, MI	62.3	Unknown	East	Domestic
	Washtenaw, MI	62.3	18	West	Domestic
	Washtenaw, MI	62.4	43	West	Domestic
	Washtenaw, MI	67.9	252	East	Domestic
	Washtenaw, MI	68.0	165	East	Domestic
	Washtenaw, MI	71.5	47	West	Domestic
	Washtenaw, MI	71.5	24	West	Domestic
	Washtenaw, MI	71.5	133	East	Domestic
	Washtenaw, MI	71.6	239	West	Domestic
	Washtenaw, MI	75.1	175	East	Domestic
	Washtenaw, MI	75.6	170	East	Domestic
	Washtenaw, MI	75.7	153	East	Domestic
	Washtenaw, MI	80.3	111	West	Domestic
	Washtenaw, MI	81.0	192	West	Domestic
	Washtenaw, MI	81.1	196	East	Domestic
	Livingston, MI	84.6	22	East	Domestic
	Livingston, MI	84.6	169	West	Domestic
	Livingston, MI	84.7	82	East	Domestic
	Livingston, MI	85.0	143	East	Domestic
	Livingston, MI	85.1	159	East	Domestic
	Livingston, MI	85.2	115	East	Domestic
	Livingston, MI	85.3	110	East	Domestic
	Livingston, MI	85.4	172	East	Domestic
	Livingston, MI	85.5	166	West	Domestic
	Livingston, MI	85.4	111	East	Domestic
	Livingston, MI	85.4	157	East	Domestic
	Livingston, MI	85.4	18	West	Domestic
	Livingston, MI	85.5	233	East	Domestic

TABLE 4.3.1-4 (continued)

Water Supply Wells Within 150 Feet of the Proposed Rover Project

Project Component	County, State	Approximate Milepost	Distance from Centerline (feet)	Direction from Construction	Type
	Livingston, MI	85.5	163	West	Domestic
	Livingston, MI	85.5	216	West	Domestic
	Livingston, MI	85.8	104	West	Domestic
	Livingston, MI	88.4	7	East	Domestic
	Livingston, MI	88.5	160	South	Domestic
	Livingston, MI	88.5	161	South	Domestic
	Livingston, MI	88.8	20	North	Domestic
	Livingston, MI	89.1	171	West	Domestic
	Livingston, MI	89.8	54	East	Domestic
	Livingston, MI	90.0	205	West	Domestic
	Livingston, MI	91.2	137	West	Domestic
	Livingston, MI	95.4	184	West	Domestic
	Livingston, MI	95.4	273	West	Domestic
	Livingston, MI	96.0	189	West	Domestic
	Livingston, MI	96.3	117	West	Domestic
	Livingston, MI	97.7	48	West	Other

Sources: Rover field surveys, MIDTMB, 2015; OHEPA, 2015b; PAGS, 2015

Of the total wells, 107 are domestic wells, and 1 has a well type (i.e., domestic or public) listed as "other" in the Michigan Geographic Data Library (MIDTMB, 2015). Rover did not provide information on the well type for the remaining 11 wells. Because we are unable to confirm whether Rover would be within 150 feet of a public water supply well, **we recommend that:**

- **<u>Prior to construction</u>, Rover should file information identifying the type of all wells located within 150 feet of the Project area without an identified well type and documentation of consultation with appropriate resource agencies for all public water supplies.**

4.3.1.6 Contaminated Groundwater

Sites with known hazardous contamination were identified through a search of federal and state hazardous waste site databases. No areas of contaminated groundwater were identified underlying the proposed Projects. As described below, there are four contaminated sites are within 1.5 miles of proposed Project facilities (EPA, 2014a-f, 2015a-b; MIDEQ, 2003; MIDTMB, 2015; OHEPA, 2015d; OHGRIP, 2015; PADEP, 2004b; PASDA, 2015b; WVGIS, 2015).

The Reilly Tar and Chemical Corporation (Dover Plant) Superfund Site is just north and adjacent to the proposed Dover Contractor Yard in Tuscarawas County, Ohio. Coal tar refinery operations that took place at this site between 1932 and 1956 contaminated an underlying shallow, perched aquifer and surrounding soils. Remediation activities at the site began in 1990 and continued through 2000. Remedial actions included the installation of a groundwater recovery trench to capture, treat, and dispose of contaminated groundwater from the perched zone aquifer. Treated groundwater collected from this trench is piped and discharged to the Dover Publicly Owned Treatment Works, and long-term monitoring of the groundwater continues. Completion of the EPA's second 5-year review in 2010 found the remedy at the site to be protective in the short-term, because there were no unacceptable levels of human or ecological exposure to site contaminants. However, as cleanup goals for the site have not been fully met, the remedy cannot be considered protective in the long-term. Sampling and monitoring of the perched zone aquifer and associated groundwater plume are ongoing, and the EPA plans to complete its third 5-year review of the site in 2015 (EPA, 2015b).

The Rasmussen's Dump and Speigelberg Landfill Superfund sites are about 1.5 miles northwest of the proposed Whitmore Lake Contractor Yard in Livingston County, Michigan. Due to the distance of these sites from the contractor yard and the successful cleanup of the sites, we do not anticipate that contaminated groundwater would be encountered in these areas as a result of Project activities.

The Kaul Clay site is located in Pennsylvania about 350 feet south of MP BGL 16.3. This site was identified to contain volatile organic compounds, semi-volatile organic compounds, petroleum products, and lead through an EPA brownfield assessment. Assessment of the site was completed in 2012 (EPA, 2015c), but as of February 2016 cleanup activities had not started. The Kaul Clay site would not be crossed by Project facilities; therefore, no impacts associated with the disturbance of contaminated groundwater are expected.

4.3.1.7 Groundwater General Impact and Mitigation

Potential impacts on groundwater would be primarily associated with excavation and backfilling activities associated with pipeline installation and construction and modification of aboveground facilities. The Rover pipeline trench would be excavated to a depth to allow a minimum of 3 feet of soil cover between the top of the pipe and the ground's surface. Depending on the diameter of the pipe and minimum cover requirements, trench depths would be between 5 and 15 feet below the ground's surface. Construction and modifications of aboveground facilities would also require some excavation, primarily for foundation installation and the removal or modification of existing underground pipes. In areas where groundwater is near the surface, excavations may intersect the water table. This could cause increases in turbidity to the affected groundwater and fluctuations in ground water levels.

When feasible, water from the trench would be dewatered to a well-vegetated upland location. All dewatering activities would be done using energy-dissipation/filtration devices in a manner that would not cause erosion or silt-laden waters to enter nearby sensitive features (e.g., waterbodies). The applicants would also monitor dewatering activities to ensure deposition of sand, silt, and/or sediment into sensitive features is not occurring. If deposition does occur, the applicants would stop dewatering activities and make adjustments to prevent reoccurrence. Dewatering structures would be removed as soon as practicable following dewatering activities.

Shallow groundwater could also sustain minor, indirect impacts due to near-surface soil compaction caused by heavy construction vehicles, as well as changes in overland water flow and recharge caused by clearing, grading, and trenching of the right-of-way. Rover would follow its Spill Procedures to avoid impacts from accidental spills, including prohibiting fuel storage, refueling, and equipment maintenance in WHPAs during construction unless approved by the appropriate authority. Similarly, Panhandle and Trunkline would follow their respective SPAR Plans to protect groundwater against potential spill-related impacts.

Contractor yards may require modifications prior to their use. Depending on the condition of the site, surface grading, fill placement, drainage improvements, and the creation of temporary roads within the yard(s) may be required. Some excavation could be necessary to implement these modifications. No trenching would be required at the sites. Where feasible, Rover chose previously disturbed or industrial sites for use as contractor yards to minimize the need for additional ground disturbance. Modifications at contractor yards could lead to similar minor, indirect, and localized impacts on groundwater caused by soil compaction and changes in overland water flow and recharge. In addition, should excavation be required in areas of shallow groundwater, construction could intersect the water table. Due to the Dover Contractor Yard's close proximity to the Reilly Tar and Chemical Corporation's Superfund Site, excavation activities have the potential to intersect the shallow aquifer underlying the site, should they be required. Although contaminated groundwater at the site has been the focus of cleanup activities for more than 20 years, the potential for residual contamination exists. While the Whitmore Contractor Yard site does encompass three WHPAs, Rover would implement its Spill Procedures to avoid and mitigate impacts related to accidental spills. Contractor yards would be restored to their original condition following construction; therefore, any impacts on groundwater would be temporary. No contractor yards are required for the Panhandle and Trunkline Projects; instead, the applicants would use the existing compressor station sites for equipment and materials storage during construction.

Should contaminated groundwater be encountered during construction, Rover has agreed to stop work and vacate the contaminated area. The workers would then notify the Chief Inspector of the contamination, and any equipment potentially contaminated would be kept onsite. Rover would collect information about the contamination and notify the agencies listed in the Spill Procedures. Only Hazardous Waste Operations-certified personnel would be allowed to enter the contaminated site and work to remediate the area. Rover would then contract with a licensed waste company to provide response, sampling, and disposal of the contaminated groundwater.

Panhandle and Trunkline would follow the procedures put forth in their respective Unanticipated Discoveries Plan for Contaminated Media if contaminated groundwater were to be discovered during construction of the Projects. If such a discovery occurs, all work would be stopped; the area would be flagged off; sorbent materials would be deployed, if needed; federal, state, and local agencies would be notified, if warranted; and a plan would be developed for the sampling, cleanup, and recommencement of work. All handling, identification, characterization, storage, transportation, record keeping, and disposal would be done in accordance with all federal, state, and local regulations.

Rover would avoid or further minimize potential impacts on groundwater resources by using construction techniques described in its Plan and Procedures, such as using temporary and permanent trench plugs and decompacting soils, where necessary. Panhandle and Trunkline would adhere to our Plan and Procedures during construction and restoration activities. After construction activities are complete, the applicants would restore the ground surface as closely as practicable to original contours and revegetate any previously vegetated, exposed soils to ensure restoration of pre-construction overland flow and recharge patterns.

Accidental Spills of Hazardous Materials

Construction of the Projects would necessitate the use of heavy equipment, associated fuels, lubricants, and other potentially hazardous substances that, if spilled, could affect shallow groundwater and/or unconsolidated aquifers. The Projects would cross both confined and unconfined aquifers. A confined aquifer is below the ground's surface with layers of impermeable material both above and below the aquifer. An unconfined aquifer is an aquifer with its upper-most surface (i.e., the water table) at atmospheric pressure. Unconfined aquifers are generally closer to the ground's surface than confined aquifers and therefore more susceptible to contamination (USGS, 2015e). Accidental spills or leaks of hazardous materials associated with vehicle fueling, vehicle maintenance, and construction materials storage would present the greatest potential contamination threat to groundwater resources. Soil contamination resulting from these spills or leaks could continue to add pollutants to the groundwater long after a spill occurs. Implementation of proper storage, containment, and handling procedures would minimize the chance of such releases. Rover's Spill Procedures and Panhandle and Trunkline's SPAR

Plans address the preventative and mitigation measures that would be implemented to avoid or minimize the potential impacts of hazardous material spills during construction. Measures outlined in Rover's Spill Procedures and Panhandle and Trunkline's SPAR Plans include, but are not limited to:

- regular inspection of containers and tanks for leaks;
- prohibition of fueling, lubricating activities, and hazardous material storage in or adjacent to sensitive areas;
- use of secondary containment for storage of petroleum products;
- implementation of emergency response procedures, including spill reporting procedures; and
- use of standard procedures for excavation and off-site disposal of any media contaminated by spillage.

We have reviewed Rover's Plan, Procedures, and Spill Procedures as well as Panhandle and Trunkline's SPAR Plans and find that these protocols adequately address the storage and transfer of hazardous materials and the response to be implemented in the event of a spill.

As discussed in section 2.5.2, Rover would employ EIs to ensure compliance with its Spill Procedures and other specifications during construction and restoration. The EIs would have the authority to stop work and order corrective actions for activities that violate the environmental conditions of our Certificate and other permit authorizations. Panhandle and Trunkline would employ contractor superintendents who would oversee all aspects of construction.

Water Use and Quality

As stated in section 4.3.1.5, 119 water supply wells are within 150 feet of the Rover Project route. Rover has agreed to perform pre- and post-construction monitoring for well yield and water quality for private wells within 150 feet of the proposed construction workspace. In addition, in areas of karst terrain, Rover would perform pre- and post-construction monitoring for well yield and water quality for private wells within 2,000 feet of proposed HDD locations (see Rover's Karst Mitigation Plan, appendix G). In these areas, Rover would monitor wells for changes in yield and turbidity that cannot be attributed to naturally occurring conditions (e.g., seasonal changes in groundwater levels). Should it be determined that the integrity of any water supply well was impacted during construction, either water quantity or quality, Rover would provide an alternative water source to the well's owner until the well can be repaired or replaced (at Rover's expense).

Rover did not indicate whether the results of pre- and post-construction monitoring evaluations would be provided to affected landowners. In addition, Rover did not provide a timeline for the implementation of post-construction evaluations. Therefore, **we recommend that:**

- **Rover should provide affected landowners with copies of applicable pre- and post-construction evaluation reports for all wells within 150 feet of the proposed construction work area (and within 2,000 feet of HDD locations in areas of karst terrain). Post-construction evaluations should be performed <u>as soon as practicable</u> following the completion of construction in the area of applicable well(s).**

No wells have been identified within 150 feet of the Panhandle and Trunkline Projects, and these Projects would not cross karst terrain. Therefore, impacts on wells associated with these Projects is not anticipated to occur. As all work would take place on industrial use land within the boundaries of existing facilities, impacts on septic systems and associated leach fields are also not anticipated to occur.

Rover would avoid impacts on septic systems and the associated leach fields, where possible. If impacts cannot be avoided, Rover would work with the landowners to repair or relocate the existing septic system.

Access Roads and Additional Temporary Workspace

The Rover Project would require the use of new temporary and permanent access roads as well as additional temporary workspace. Rover has proposed to minimize the potential impacts from construction of access roads and additional temporary workspace on groundwater using the same measures it would employ during pipeline and aboveground facility construction. Although some clearing and grading activities may be associated with the access roads and additional temporary workspace, trenching and drilling would not take place in these areas, thereby reducing the potential for impact. Construction and operation of new access roads would also lead to a decrease in pervious ground surface in the areas where the roads are located. Decreases in pervious surface can lead to increased runoff and lowered water infiltration rates, which can subsequently reduce groundwater recharge rates. However, because the potential impacts on groundwater recharge rates due to access road construction and operation would be localized and predominantly temporary in nature, we conclude these impacts would not be significant.

Panhandle and Trunkline would use existing public roads to access work areas during construction, and all work areas would be limited to lands currently owned or leased by the applicants. Panhandle and Trunkline would adhere to the FERC's Plans and Procedures during construction and would restore the areas pre-construction contours following construction activities. For these reasons, we do not expect the construction or use of access roads and additional temporary workspace associated with the Panhandle and Trunkline Projects to impact groundwater resources.

Blasting

Blasting could affect groundwater quality by temporarily changing groundwater levels and increasing groundwater turbidity near the construction right-of-way. The Panhandle and Trunkline Projects are not within areas of shallow or exposed bedrock. Further, all work for these two Projects would be done at existing facilities, which precludes the use of blasting. Rover also does not anticipate that blasting would be required for its Project. However, the Rover Project would cross areas of shallow or exposed bedrock where Rover is currently proposing to use mechanical methods to excavate the trench. In the unlikely event that blasting would be required, Rover would comply with the measures outlined in its Blasting Plan (see appendix G).

We anticipate that impacts on groundwater resources from blasting would not occur, as the applicants have stated that they do not anticipate the need for blasting. However, should blasting be required, we expect that impacts on nearby wells and springs (such as increases in turbidity) from blasting would be temporary and would likely dissipate shortly after blasting or after a well has been flushed several times. Potential impacts from blasting are also discussed in section 4.1.

Operation Impacts

The Rover pipeline would be a fixed belowground structure, coated in accordance with DOT standards and hydrostatically tested prior to the commencement of operation in order to avoid initial leaks. Rover would conduct monitoring in accordance with DOT requirements during operations to minimize potential impacts of corrosion and leaks. Areas that are permanently converted from vegetated land to filled, industrial-use land would experience a localized reduction in groundwater infiltration at the site. However, this relatively small reduction of pervious surface is not expected to affect overall groundwater recharge rates in the area. Potential spill-related impacts on groundwater from the inadvertent release of petroleum products or other chemicals used at the aboveground facilities would be minimized and mitigated (if a release occurs) through the use of Rover's Spill Procedures and Panhandle and Trunkline's SPAR Plans (see appendix G). In accordance with these plans, all chemicals would be stored in approved containment structures. Therefore, no significant impacts on groundwater resources are anticipated to occur during operation of the Projects.

Conclusion

No long-term impacts on groundwater are anticipated from construction or operation of the Projects, because disturbances would be temporary and/or minor, erosion controls would be implemented, natural ground contours would be restored, and the right-of-way revegetated, as applicable. Implementation of Rover's Plan, Procedures, Spill Procedures, and Karst Mitigation Plan would limit impacts from construction on groundwater resources. Temporary, minor, and localized impacts could result during trenching activities in areas with shallow groundwater (depth less than 10 feet below the ground surface) crossed by the Projects.

The Panhandle and Trunkline Projects would not involve pipeline installation, and all work would be done at existing industrial-use sites. Further, no karst terrain is associated with these Projects, and there are no wells within 150 feet.

The greatest threat posed to groundwater resources for all Projects would be a hazardous material spill or leak into groundwater supplies. We have reviewed Rover's Spill Procedures along with Panhandle and Trunkline's SPAR Plans and conclude that these plans adequately address strategies and methods to prevent or limit such contamination should a spill occur. We do not anticipate any significant impacts on aquifers by the proposed Projects.

4.3.2 Surface Water Resources

Surface waters support multiple public uses including drinking water, recreation, fish and wildlife habitat, navigation, and industrial and agricultural production. In the Rover Project area, depending on these uses, surface waterbodies are regulated at the federal level by the COE and EPA and at the state level by various state agencies including the PADEP, WVDEP, WVDNR, OHEPA; and MIDEQ. Working in and around surface waters may require permits or certifications for water quality, water discharge or withdrawal, and waterbody crossings. The discharge of fill material into waterbodies (e.g., backfilling) is regulated by Section 404 of the CWA, which requires a permit be obtained before such activities occur, unless the activity is exempt from Section 404 regulation (e.g., certain farming and forestry activities) (EPA, 2016).

4.3.2.1 Existing Surface Water Resources

The Projects would cross 22 watersheds. The names of watersheds crossed and their drainage areas within the Projects' area(s) are provided in table 4.3.2-1. The Rover Project would cross various waterbodies, but the Panhandle and Trunkline Projects would not since they are limited to modification at existing facilities.

Rover identified surface water resources in the Project area during field surveys conducted between June 2014 and February 2016. During Rover's waterbody field surveys, man-made drainage features were identified that are generally narrow, linear aquatic features created for agricultural purposes or to serve as roadside drainage.

TABLE 4.3.2-1

Watersheds Crossed by the Proposed Projects

Watershed Name	Project Facility(s) a	Drainage Area b (acres)
ROVER PIPELINE PROJECT		
Cedar-Portage	Mainlines A and B	612,496
Huron	Market Segment	587,690
Little Muskingum-Middle Island	Berne Lateral, CGT Lateral, Seneca Lateral, Sherwood Lateral	1,161,521
Lower Maumee	Mainlines A and B	689,821
Mohican	Mainlines A and B	643,203
Raisin	Market Segment	680,355
Sandusky	Mainlines A and B	1,164,998
Tiffin	Market Segment	497,659
Tuscarawas	Burgettstown Lateral, Cadiz Lateral, Supply Connectors A and B, Mainlines A and B	1,660,549
Upper Grand	Market Segment	1,126,456
Upper Ohio	Burgettstown Lateral	1,271,375
Upper Ohio-Wheeling	Clarington Lateral, Majorsville Lateral, Seneca Lateral	967,167
Walhonding	Mainlines A and B	800,577
Wills	Berne Lateral, Seneca Lateral	546,127
PANHANDLE BACKHAUL PROJECT		
Auglaize	Edgerton Compressor Station	1,065,834
Middle Wabash-Little Vermillion	Montezuma Compressor Station, Tuscola 6 Gate	1,463,558
Raisin	Edgerton 10 Gate	695,667
Tiffin	Panhandle-Rover Interconnect	500,500
Upper Kaskaskia	Tuscola Compressor Station	1,004,393
Upper White	Zionsville 3 Gate, Zionsville Compressor Station	1,762,521
TRUNKLINE BACKHAUL PROJECT		
Coldwater	Independence Compressor Station	1,234,444
Lower Ohio	Joppa Compressor Station	600,163
North Fork Forked Deer	Dyersburg Compressor Station	612,035
Skillet	Johnsonville Compressor Station	671,320
Upper Kaskaskia	Panhandle-Trunkline Interconnect, Bourbon Meter Station	1,004,393

Source: USDA, 2014c

a Aboveground facilities for the Rover Project are located along the Rover pipeline routes and within the same watersheds. Therefore, Rover aboveground facilities are not included in this table.

b Represents the watershed's total drainage area for all counties in which the Project would be located.

Appendix L lists the 864 waterbody and 139 drainage feature crossings that would occur within the pipeline right-of-way during construction of the Rover Project. These include 365 perennial waterbody crossings and 17 perennial drainage crossings; 312 intermittent waterbody crossings and 33 intermittent drainage crossings; 181 ephemeral waterbody crossings and 89 ephemeral drainage crossings; and 6 lake/pond crossings. In addition to the waterbody and drainage crossings that would occur along the trench line, another 160 waterbodies and 43 man-made drainage features would be within Rover's construction right-of-way (but would not be crossed by the pipeline) (see appendix L).

Pipeline Facilities

Of the 864 waterbody crossings that would take place within the permanent right-of-way, 677 would be minor waterbody crossings (waterbodies less than 10 feet wide), 179 would be intermediate crossings (waterbodies 10 to 100 feet wide), and 8 would be major waterbody crossings (waterbodies greater than 100 feet wide). Rover provided site-specific crossing plans for all the waterbodies that would be crossed by the pipelines using the HDD method (see appendix G).

Within the permanent right-of-way, the Supply Lateral pipelines would require 571 waterbody crossings and 40 drainage crossings, the Mainline A and B pipelines would require 230 waterbody and 67 drainage crossings, and the Market Segment pipeline would require 63 waterbody and 31 drainage crossings.

Aboveground Facilities and Contractor Yards

Rover's proposed aboveground facility and contractor yard sites would require one crossing of an ephemeral drainage feature at the Clarington Compressor Station in Monroe County, Ohio (as described in appendix L).

Access Roads and Cathodic Protection System

There would be 54 waterbodies and 12 drainage features crossed by access roads (see table 4.3.2-2). Only five of these waterbodies are associated with a proposed new access road.

The Panhandle and Trunkline Projects would use existing, public roads to access work areas.

Rover would install and maintain a current cathodic protection system to help protect the pipeline from external corrosion. At this time Rover has not identified the locations or size of these facilities; any cathodic protection beds Rover would require that would be outside of any approved workspace would fall under the variance process described in section 2.5.4.

TABLE 4.3.2-2

Waterbody and Drainage Feature Crossings at the Proposed Rover Access Roads

Associated Facility	Location (County and State)	Approximate Milepost	Waterbody or Drainage Name	Flow Type	Number of Crossings	Road Type
CGT Lateral	Doddridge County, WV	0.0	Unnamed tributary to Morgans Run	Perennial	1	Existing Permanent
CGT Lateral	Doddridge County, WV	3.1	Unnamed waterbody	Intermittent	1	Existing Temporary
CGT Lateral	Doddridge County, WV	3.1	Unnamed waterbody	Ephemeral	2	Existing Temporary
Clarington Lateral	Belmont County, OH	5.1	Unnamed waterbody	Intermittent	1	Existing Temporary
Clarington Lateral	Belmont County, OH	16.3	Unnamed ditch	Ephemeral	3	Existing Temporary
Clarington Lateral	Belmont County, OH	20.4	Unnamed tributary to Wheeling Creek	Perennial	1	Existing Temporary
Clarington Lateral	Belmont County, OH	21.6	Unnamed waterbody	Perennial	1	Existing Permanent
Clarington Lateral	Belmont County, OH	22.3	Unnamed waterbody	Perennial	1	Existing Temporary
Clarington Lateral	Belmont County, OH	24.7	Unnamed tributary to Crabapple Creek	Ephemeral	2	Existing Temporary
Clarington Lateral	Harrison County, OH	30.3	Unnamed ditch	Ephemeral	1	Existing Temporary
Clarington Lateral	Harrison County, OH	30.7	Unnamed waterbody	Perennial	1	Existing Temporary
Majorsville Lateral	Marshall County, WV	2.6	Unnamed tributary to Wheeling Creek	Intermittent	1	Existing Temporary
Majorsville Lateral	Belmont County, OH	10.6	Unnamed ditch	Ephemeral	1	New Temporary
Majorsville Lateral	Belmont County, OH	18.3	Unnamed waterbody	Intermittent	1	Existing Temporary
Majorsville Lateral	Belmont County, OH	18.3	Unnamed waterbody	Ephemeral	1	Existing Temporary
Majorsville Lateral	Belmont County, OH	18.3	Unnamed waterbody	Perennial	1	Existing Temporary
Majorsville Lateral	Belmont County, OH	18.8	Unnamed ditch	Ephemeral	1	Existing Temporary
Seneca Lateral	Monroe County, OH	5.1	Unnamed tributary to South Fork	Perennial	1	Existing Temporary
Seneca Lateral	Monroe County, OH	5.1	Unnamed tributary to South Fork	Intermittent	1	Existing Temporary
Seneca Lateral	Monroe County, OH	17.6	Unnamed tributary to East Fork	Intermittent	1	Existing Temporary
Seneca Lateral	Monroe County, OH	19.6	Ackerson Run	Perennial	1	Existing Temporary

TABLE 4.3.2-2 (continued)

Waterbody and Drainage Feature Crossings at the Proposed Rover Access Roads

Associated Facility	Location (County and State)	Approximate Milepost	Waterbody or Drainage Name	Flow Type	Number of Crossings	Road Type
Seneca Lateral	Monroe County, OH	19.6	Unnamed waterbody	Intermittent	1	Existing Temporary
Sherwood Lateral	Doddridge County, WV	1.0	Englands Run	Perennial	1	Existing Temporary
Sherwood Lateral	Doddridge County, WV	1.0	Unnamed tributary to Englands Run	Intermittent	2	Existing Temporary
Sherwood Lateral	Doddridge County, WV	1.5	Unnamed tributary to Morgans Run	Perennial	1	Existing Permanent
Sherwood Lateral	Doddridge County, WV	2.0	Unnamed tributary to Morgans Run	Ephemeral	3	Existing Temporary
Sherwood Lateral	Doddridge County, WV	3.4	Unnamed ditch	Ephemeral	1	Existing Temporary
Sherwood Lateral	Doddridge County, WV	4.3	Unnamed ditch	Ephemeral	1	Existing Temporary
Sherwood Lateral	Doddridge County, WV	8.6	Unnamed tributary to Camp Mistake Run	Ephemeral	1	New Temporary
Sherwood Lateral	Tyler County, WV	10.2	Unnamed tributary to Jefferson Run	Ephemeral	1	Existing Temporary
Sherwood Lateral	Tyler County, WV	12.0	Erosion gully	Ephemeral	1	Existing Temporary
Sherwood Lateral	Tyler County, WV	12.8	Unnamed tributary to Middle Island Creek	Ephemeral	1	Existing Temporary
Sherwood Lateral	Tyler County, WV	12.8	Unnamed tributary to Ross Run	Ephemeral	1	Existing Temporary
Sherwood Lateral	Tyler County, WV	14.4	Unnamed tributary to Purgatory Run	Ephemeral	1	Existing Temporary
Sherwood Lateral	Tyler County, WV	15.6	Fosters Run	Intermittent	1	Existing Temporary
Sherwood Lateral	Tyler County, WV	15.6	Unnamed tributary to Fosters Run	Intermittent	1	Existing Temporary
Sherwood Lateral	Tyler County, WV	17.9	Fosters Run	Perennial	1	New Temporary
Sherwood Lateral	Tyler County, WV	22.2	Gorrell Run	Perennial	1	Existing Temporary
Sherwood Lateral	Tyler County, WV	22.2	Unnamed tributary to Gorrell Run	Intermittent	1	Existing Temporary
Sherwood Lateral	Tyler County, WV	22.4	Gorrell Run	Perennial	1	Existing Temporary
Sherwood Lateral	Tyler County, WV	23.7	Unnamed waterbody	Ephemeral	1	Existing Permanent
Sherwood Lateral	Tyler County, WV	23.7	Unnamed ditch	Ephemeral	1	Existing Permanent

TABLE 4.3.2-2 (continued)						
Waterbody and Drainage Feature Crossings at the Proposed Rover Access Roads						
Associated Facility	**Location (County and State)**	**Approximate Milepost**	**Waterbody or Drainage Name**	**Flow Type**	**Number of Crossings**	**Road Type**
Sherwood Lateral	Tyler County, WV	25.8	Unnamed waterbody/erosion gully	Ephemeral	4	Existing Temporary
Sherwood Lateral	Tyler County, WV	28.0	Unnamed waterbody	Intermittent	1	Existing Temporary
Sherwood Lateral	Tyler County, WV	29.1	Unnamed tributary to Badger Run	Ephemeral	1	Existing Permanent
Sherwood Lateral	Tyler County, WV	29.8	Unnamed waterbody	Ephemeral	1	Existing Temporary
Sherwood Lateral	Tyler County, WV	29.8	Unnamed waterbody	Intermittent	2	Existing Temporary
Sherwood Lateral	Tyler County, WV	30.1	Unnamed waterbody	Ephemeral	1	Existing Temporary
Sherwood Lateral	Tyler County, WV	33.0	Unnamed tributary to Paden Fork	Ephemeral	1	Existing Temporary
Supply Connector A and B	Henry County, OH	7.1	Clear Fork	Perennial	1	Existing Temporary
Supply Connector A and B	Henry County, OH	14.9	Unnamed tributary to Conotton Creek	Intermittent	1	Existing Temporary
Mainlines A and B	Wood County, OH	174.1	Unnamed ditch	Intermittent	1	New Permanent
Mainline A	Defiance County, OH	208.9	Unnamed waterbody	Perennial	1	Existing and New Permanent
Market Segment	Washtenaw County, MI	62.9	Unnamed waterbody	Perennial	1	Existing Temporary
Market Segment	Livingston County, MI	98.8	Unnamed tributary to Red Cedar River	Perennial	1	Existing Temporary
Source: Rover field surveys						

4.3.2.2 Public Watersheds

Public watersheds are surface waters used for public water supplies. The applicants used publicly available data and their field survey data to obtain information regarding public watersheds in the areas of the Projects.

Rover identified six waterbodies that would be crossed within 3 miles upstream of potable water supply surface water intakes in Ohio (see table 4.3.2-3). No waterbodies in Pennsylvania or Michigan would be crossed within 3 miles upstream of a potable surface water intake. (MIDTMB, 2015; PADEP, 2004b; PAGS, 2015). Based on correspondence between Rover and the West Virginia Department of Health and Human Resources (WVDHHR), West Virginia state policy prohibits the release of locational data for surface water intakes (WVDHHR, 2015a), and there have otherwise been no potable water supply surface water intakes identified within 3 miles downstream of proposed waterbody crossings in West Virginia.

TABLE 4.3.2-3

Public Watersheds Crossed by the Proposed Rover Pipeline Project

State/ County a	Water Supply	Nearest Crossing Location (MP)	Basis for Classification as a Public Water Supply Watershed
Ohio			
Hancock	East Branch Portage River	MAB 155.1	Located within 3 miles upstream of the Fostoria City public water supply system (PWS)
Jefferson	Ohio River	BGL 15.8	Located within 3 miles upstream of the Toronto PWS
Monroe	Woodsfield Reservoir 2	SEL 11.8	Located within 3 miles upstream of the Woodsfield Village PWS
Monroe	Sunfish Creek	SEL 11.8	Located within 3 miles upstream of the Woodsfield Village PWS
Monroe	Woodsfield Reservoir 1	SEL 11.8	Located within 3 miles upstream of the Woodsfield Village PWS
Richland	Black Fork Mohican River	MAB 109.0	Located within 3 miles upstream of the Shelby Water Treatment Plant

Sources: MIDTMB, 2015; OHEPA, 2015a; PADEP, 2004b; PAGS, 2015; WVDHHR, 2015a

BGL = Burgettstown Lateral

MAB = Mainlines A and B

SEL = Seneca Lateral

a No public watersheds were identified as being crossed by the Rover Project in Michigan, West Virginia, or Pennsylvania.

4.3.2.3 Water Classifications

Section 303(d) of the CWA requires that each state review, establish, and revise water quality standards for all surface waters within each state. State classification systems develop monitoring and mitigation programs to ensure that water standards are attained as designated. Waters that fail to meet their designated use are considered as impaired and are listed under a state's Section 303(d) list of impaired waters. The state water classifications are described below, the location of these waterbodies are described in section 4.3.2.4, and the potential impacts and associated mitigation for these waterbodies are described in section 4.3.2.6.

No waterbodies would be crossed by the Panhandle or Trunkline Projects. Therefore, water quality standards for states that would be crossed exclusively by either of these Projects (i.e., Indiana, Illinois, Mississippi, and Tennessee) are not discussed below.

Pennsylvania

Pennsylvania Code Title 25, Chapter 93, establishes water quality standards for each waterbody based on their use. Waterbody uses include: aquatic life, water supply, recreation, fish consumption, special protection, and navigation. Surface waters of Pennsylvania are classified as: coldwater fisheries, warmwater fisheries, migratory fisheries, and trout-stocked. Select waterbodies are further classified as high quality (HQ) or exceptional value (EV) and given special protection.

In order to be classified as a HQ surface water, the waterbody must have at least 1 year of water quality data that exceed parameters outlined in Pennsylvania Code Title 25 Chapter 93.4(b), support a high-quality aquatic community with a benthic macroinvertebrate score of 83 percent or more, or is classified as Class A wild trout stream.

In order to be classified as an EV surface water, the waterbody must meet the criteria for a HQ waterbody and at least one of the following:

- a surface water of exceptional recreational significance;
- designated as a wilderness trout stream;
- a surface water of exceptional ecological significance;
- located in an outstanding national, state, regional or local resource water;
- located in a national wildlife refuge, state game propagation and protection area, designated state park natural area, state forest natural area, national natural landmark, federal wilderness area, or national recreational area; or
- a federal or state wild river. (Pennsylvania Code, 2012).

West Virginia

Water quality standards for West Virginia surface waters are detailed in the WVDEP's *Requirements Governing Water Quality Standards Rule* (Title 47 Code of State Rules [CSR] 2). Under this rule, waters are categorized as public water supply (Category A), propagation and maintenance of fish and other aquatic life (Category B), water contact recreation (Category C), agricultural and wildlife uses (Category D), and water supply industrial/water transport/cooling and power (Category E). Select waters are further classified as HQ and/or outstanding national resource waters, which are afforded additional protection.

In order to be classified as a HQ surface water in West Virginia, the waterbody's quality must be equal to or better than minimum levels necessary to achieve the national water quality goal uses. West Virginia HQ waters may include, but are not limited to the following:

- streams designated as HQ waters under the *West Virginia Natural Stream Preservation Act*;
- streams listed in the West Virginia HQ Streams, Fifth Edition, prepared by the Wildlife Resources Division of the WVDEP; or
- streams or stream segments that receive annual stockings of trout but that do not support year-round trout populations.

Outstanding national resource waters include, but are not limited to:

- all streams and rivers within the boundaries of Wilderness Areas designated under the *U.S. Wilderness Act (16 U.S.C. §1131 et seq.)*;
- all federally designated rivers under the *Wild and Scenic Rivers Act (16 U.S.C. §1271 et seq.)*;
- all streams and other bodies of water in state parks, national parks, or national forests that are HQ waters or naturally reproducing trout streams;
- waters designated under the *National Parks and Recreation Act of 1978 (16 U.S.C. 1)* as amended; or
- pursuant to Subsection 7.1 of 60 CSR 5, those waters whose unique character, ecological or recreational value, or pristine nature constitutes a valuable national or state resource (WVDEP, 2015b).

Ohio

Water quality standards for Ohio surface waters are detailed in the OHEPA's *Chapter 3745-41 of the Ohio Administrative Code*. In accordance with these standards, each Ohio surface water is assigned one or more aquatic life habitat use designations, and each may be assigned one or more water supply use designations and/or one recreational use designation. Use designations include: aquatic life habitat, nuisance prevention (this designation will be phased out over time and replaced with a limited resource water use designation), water supply, and recreation. Each use designation is supported by statewide chemical-specific water quality criteria (OHEPA, 2015c).

Michigan

Water quality standards for Michigan surface waters are detailed in the MIDEQ's *Part 4 Rules* (of *Part 31, Water Resources Protection, of Act 451 of 1994*). These standards are the minimum water quality requirements by which Michigan surface waters are managed. In accordance with the Part 4 Rules, all state surface waters are designated and protected for the following uses:

- agriculture;
- navigation;
- industrial water supply;
- warmwater fishery;
- other indigenous aquatic life and wildlife;
- partial body contact recreations; and
- fish consumption.

In addition, all state surface waters are designated and protected for total body contact recreation from May 1 to October 31 (MIDEQ, 2006b).

4.3.2.4 Sensitive Waterbodies

There are 263 proposed waterbody crossings of sensitive surface waterbodies (or segments of waterbodies) for the Rover Project. Crossing widths range from less than 1 foot to 1,825 feet, with a total length of sensitive waterbodies crossed of about 8,112 feet (1.5 miles). There would be 4 sensitive waterbody crossings in Pennsylvania, 18 in West Virginia, 207 in Ohio, 2 in both West Virginia and Ohio at the states' common border, and 32 in Michigan. Appendix L lists sensitive waterbody crossings proposed by the Rover Pipeline Project along with the basis for their sensitivity. Waterbodies considered sensitive include, but are not limited to:

- waters that do not meet the water quality standards associated with the state's designated beneficial uses;
- surface waters that have been designated for intensified water quality management and improvement;
- waterbodies that contain threatened or endangered species or critical habitat;
- waters that support fisheries of special concern (e.g., trout streams);
- waterbodies that are designated as an outstanding resource water; or

- waterbodies on or designated to be added to the Nationwide Rivers Inventory and similar state lists.

Impaired Waterbodies and Contaminated Sediments

The majority of the sensitive waterbodies that would be crossed are considered sensitive because they are listed on their respective state's Section 303(d) List of Impaired Waters for not meeting water quality standards. The Rover Project would require a total of 233 impaired waterbody crossings (as listed on a state's 303(d) list of impaired waters)[3]. Of these aquatic features, 1 is in Pennsylvania, 21 are in West Virginia, 182 are in Ohio, and 29 are in Michigan (WVDEP, 2012; MIDEQ, 2014; OHEPA, 2014c; PADEP, 2014). Sediments within impaired waters are often contaminated by the same pollutants. Rover would minimize the potential for adverse impacts associated with the disturbance of contaminated sediments by using BMPs to control soil erosion and sedimentation, working with the appropriate state and federal government agencies regarding the potential to encounter contaminated sediments, and developing mitigation measures with the agencies if contaminated sediment is confirmed. Neither the Panhandle nor Trunkline Projects are near any state-listed impaired waterbodies.

Waterbodies that Support Fisheries of Special Concern

Rover consulted with federal and state agencies to identify waterbodies that may contain federally or state-listed threatened, endangered, or candidate species and their habitats, coldwater fisheries, and other fisheries resources that could be considered fisheries of special concern. Consultations determined that 23 crossings of waterbodies classified as fisheries of special concern would be required by the Rover Project, including 3 crossings of Approved Trout Waters in Pennsylvania, 17 crossings of waterbodies designated as Coldwater Habitat in Ohio, and 3 crossings of streams designated as Exceptional Warmwater Habitat in Ohio. The occurrence of federally or state-listed threatened, endangered, or candidate species is limited to a subset of these 23 waterbody crossing as described in section 4.7. Section 4.6.2.2 discusses waterbodies containing fisheries of special concern.

Nationwide Rivers Inventory and State-listed Scenic Rivers

The Nationwide Rivers Inventory is a listing of free-flowing river segments that possess one or more "outstandingly remarkable" natural or cultural values judged to be of more than local or regional significance (River Network, 2015). One river, the Tuscarawas River (MP MAB 42.2), is listed on the Nationwide Rivers Inventory.

States designate certain rivers as Scenic Rivers under the Scenic River Act. Under this Act, rivers are classified for their wild, scenic, and recreational values. These values are determined based on certain criteria, including the waterbody's length, adjacent forest cover, biological characteristics, water quality, present use, and natural conditions (OHDNR, 2015c). The Sandusky River and Maumee River (MPs MAB 142.2 and MB 200.4, respectively) are classified as Ohio Scenic Rivers.

Traditional Navigable Waters

Traditional navigable waters are regulated by the COE and include waters historically or currently being used for commercial navigation, including commercial waterborne recreation, as well as waters susceptible to being used in the future for commercial navigation (NARA, 2014). The Rover

[3] All applicable state 303(d) lists are current as of 2014 except for that of West Virginia. West Virginia's 2014 303(d) list is under review by the EPA; therefore, its federally approved 2012 303(d) list was used for this analysis.

Project would cross one traditional navigable water, the Ohio River, at three separate locations (see appendix L).

Flood Hazard Zones

The Projects would cross four Federal Emergency Management Agency (FEMA) identified flood hazard zone designations: A, AE, C, and X. According to FEMA, Zone A and AE areas have a 1 percent annual chance of a flood event. These areas are known as the base flood or 100-year flood. Zones C and X are areas of minimal flooding. Zone C may be characterized by ponding or local drainage problems, and Zone X is outside the 500-year floodplain and protected by levee from a 100-year flood (FEMA, 2015). The Rover pipeline route falls within Zone A and AE areas, and the Panhandle and Trunkline Project areas are within Zone X areas, except for Trunkline's Joppa Compressor Station, which is within Zone C (see appendix L). An estimated 148 acres of land in Zone AE and 286 acres of land in Zone A would be impacted during construction of the Rover Project.

Flowage Easements

A flowage easement is privately owned land on which the federal government has acquired certain perpetual rights, which usually include the right to flood, or overflow, the land with water (Kunzler, 1996). Federal rights associated with a flowage easment can also include the right to prohibit construction or maintenance of any structure for human habitation as well as the right to approve all other structures constructed on flowage easement land, except wire fencing. Regulations can vary between flowage easements as well as between individual properties within the same easement (COE, 2016).

The COE identified six flowage easements that would be crossed by the Rover Project: the Beach City Dam, Bolivar Dam, Charles Mill Dam, Dover Dam, Mohicanville Dam, and Tappan Dam Flowage Easements. All of the flowage easements crossed by the proposed Rover Project are in Ohio, and total approximately 13.3 miles (see table 4.3.2-4). There are no flowage easements associated with the Panhandle or Trunkline Projects.

Section 14 of the Rivers and Harbors Act of 1899 and codified in 33 USC 408 (commonly referred to as "Section 408") authorizes the COE to grant permission for the alteration or occupation or use of a COE civil works project if the Secretary of the Army determines that the activity will not be injurious to the public interest and will not impair the usefulness of the project. As such, Rover applied to the COE for a Section 408 permit on April 22, 2016. As of the date of the publication of this EIS, the COE has not made a determination regarding Rover's permit application.

TABLE 4.3.2-4

Federal Flowage Easements Crossed by the Proposed Rover Project

Project Facility	Flowage Easement	Maximum Crest Elevation (ft)	Location: County(s) a	Location: State	Location: Enter MP	Location: Exit MP	Distance Crossed (miles) b c
Mainline A and B	Bolivar Dam	962	Tuscarawas, Stark	Ohio	33.9	38.4	3.1
Mainline A and B	Beach City Dam	977	Stark	Ohio	47.4	49.1	1.3
Mainline A and B	Mohicanville Dam	963	Wayne, Ashland	Ohio	77.7	84.4	1.9
Mainline A and B Burgettstown Lateral	Dover Dam	916	Carroll, Tuscarawas, Stark	Ohio	21.6	42.4	5.6
Mainline A and B	Charles Mill Dam	1,022	Ashland, Richland	Ohio	95.0	96.0	1.0
Supply Connector A and B	Tappan Dam	909	Harrison	Ohio	4.7	7.4	0.5
						Total	**13.3**

a Includes only the counties in which the flowage easement is crossed by the Project area.
b Estimated distance is based on the distance crossed along each land parcel within the flowage easement.
c Mathematical discrepancies are due to rounding.
Source: COE, 2005

4.3.2.5 Waterbody Construction Procedures

As described above, 864 waterbody crossings and 139 drainage crossings would take place within the Rover pipelines' permanent rights-of-way. Rover would cross all waterbodies according to state-designated timing windows as discussed in section 4.6.2.1.

Open-cut Crossing Method (Wet)

In its application, Rover proposed to cross nearly all waterbodies with the open-cut crossing method. Wet open-cut crossing methods are described in section 2.3.2.2 and Appendix L provides a list of waterbodies that would be crossed (and by which method). In the draft EIS, we recommended that Rover instead use dry-ditch crossing methods for all sensitive waterbodies where it was proposing open-cut methods to further minimize potential impacts on sensitive fisheries resources and water and sediment quality. Rover subsequently provided comments on the draft EIS indicating that the sensitive waterbodies crossed include those on state CWA 303(d) lists, and may not contain threatened or endangered species, critical habitat, or waters that support fisheries of special concern, waters that are designated as an outstanding resource water, and waterbodies on the Nationwide Rivers Inventory and/or similar state lists. Rover requested that FERC revise its recommendation to use dry-ditch methods and restrict it only to 30 sensitive waterbodies that are coldwater fisheries or exceptional warmwater habitat. Crossing waterbodies that support fishery resources by dry crossing methods can reduce short-term impacts on these resources, however open-cut crossing methods are acceptable for waterbodies designated sensitive by impairments in the water column. Therefore we have revised **our recommendation such that:**

- **<u>Prior to construction</u>, Rover should confirm that it will use dry-ditch crossing methods for all waterbodies designated as coldwater fisheries or exceptional warmwater habitat except those already proposed as an HDD.**

Dry-Ditch Crossing Methods

While Rover was not proposing to use dry-ditch crossing methods prior to our draft EIS, Rover subsequently proposed the use of dry-ditch crossing methods for 19 coldwater fishery perennial waterbody crossings. In addition, Rover proposed to use dry-ditch crossing methods for 11 ephemeral or intermittent tributaries to coldwater fishery and exceptional warmwater perennial waterbodies if flow was present in those waterbodies at the time of construction (these 30 waterbodies also encompass the waterbodies along the Rover pipeline route that support federally listed species). If there were no flow present in these ephemeral and intermittent tributaries, Rover would use open-cut methods. Dry-ditch methods are designed to isolate the pipeline corridor from the surface water during active trenching, pipeline installation, and backfilling to reduce the magnitude and duration of turbidity and sedimentation that may be associated with wet open-cut methods. As discussed above, we are continuing to recommend that Rover cross certain waterbodies of importance (coldwater and exceptional warmwater fisheries) with dry-ditch crossing methods to minimize potential impacts.

Horizontal Directional Drill

Rover would use the HDD method to cross all major waterbodies (i.e., waterbodies greater than 100 feet wide at the proposed crossing location) and several sensitive waterbodies. Rover's 30 HDDs would cross 45 waterbodies as described in section 2.3.2.2. In some instances, one HDD would cross multiple waterbodies.

Waterbodies within Workspaces

As discussed in section 4.3.2.1, 160 waterbody crossings and 43 drainage crossings along the proposed pipeline routes would be within the construction workspaces, but not crossed by the pipelines (see appendix L). Rover would adhere to its Procedures to minimize impacts on waterbodies and drainages within the construction rights-of-way, to the extent possible. If Rover cannot avoid impacting a waterbody, it would limit impacts on the installation of temporary equipment crossings (such as matting) and/or clearing of adjacent vegetation. Rover would maintain a 15-foot vegetation buffer between the waterbody and the workspace. Rover would also install sediment and erosion control devices along these waterbodies. We have reviewed Rover's proposed mitigation measures and find them acceptable.

Public Watersheds and Reservoirs

Rover would cross six waterbodies within 300 feet upstream of their use as a potable public water supply in Ohio (see table 4.3.2-3). Rover would implement protective measures such as its Procedures, Karst Mitigation Plan, and Spill Procedures to avoid impacts on drinking water sources. Therefore, we do not anticipate any impacts on public watersheds or associated public water supplies due to the proposed Projects.

Hydrostatic Testing and Dust Control

Rover would verify the integrity of its pipeline before placing it into service by conducting hydrostatic testing. These tests would be conducted in accordance with DOT regulations to ensure that the system is capable of withstanding 125 percent of the maximum allowable operating pressure (MAOP). This testing involves cleaning each test segment prior to hydrostatic testing, filling the pipeline with water, pressurizing it, and then checking for pressure losses due to pipeline leakage. The amount of water required to pre-clean the test segments would vary depending on the length and diameter of each segment. Rover proposes to withdraw about 266 million gallons of test water from 36 waterbodies and from various municipal supplies to fill and pressurize the segments (see table 4.3.2-5). Rover would not add chemicals to the test water, and the test water would only contact new, unused pipe. The testing would occur at 50 test segments (see table 4.3.2-6). Hydrostatic test water would be held for a minimum of 8 hours and may be transferred between test segments to minimize the total volume of test water needed. Following testing, hydrostatic test water would be discharged through an energy-dissipating device into an upland vegetated area at a rate no greater than 2,000 gpm. All discharge of hydrostatic test water (including water used for pre-cleaning) would be done in accordance with Rover's Procedures and any applicable state requirements. Rover has stated that no desiccant or chemical additives would be used to dry the pipe after testing is complete. For hydrostatic testing within compressor stations, Rover would use water trucked in from municipal sources and haul the water off site for disposal. Volumes would range from 21,000 to 63,000 gallons depending on the size of the compressor station.

Panhandle and Trunkline would also hydrostatically test their pipes before installation to ensure their integrity and that they are free from leaks. Panhandle anticipates needing a maximum of 400,000 gallons of water for hydrostatic testing of its proposed Project, while Trunkline anticipates needing a maximum of 490,000 gallons. All water used for hydrostatic testing for both Projects would be obtained from municipal sources and would be transported to the Project sites by truck. Testing activities (including water discharge) would be done in accordance with DOT pipeline safety regulations, the FERC's Plans and Procedures, and all other applicable permit requirements. Estimated volumes of water that would be required for hydrostatic testing at each of the Panhandle and Trunkline Project components is provided in table 4.3.2-5. Following testing for both Projects, water would be discharged to well-vegetated upland areas at a rate of approximately 450 gpm. Panhandle and Trunkline may also pre-clean segments prior to testing to remove any dirt or debris. Pre-cleaning would be done using relatively small amounts of municipal water trucked to the site. No chemicals would be added to water used to pre-clean the test segments. This water would be hauled offsite for disposal.

Rover would minimize potential impacts on aquatic wildlife (i.e., impingement and entrainment) during hydrostatic test water withdrawals to the extent practicable by maintaining base flows, floating the intake structure above the bed of the waterbody, and affixing a screen to the outside of the intake structure.

Rover, Panhandle, and Trunkline would have water trucks available at each active construction site for dust control activities, if necessary. The applicants would obtain all appropriate permits and authorizations required prior to conducting any dust control activities. Given the length of the proposed Rover pipeline and that weather conditions would play a large role, it is impossible to predict precisely how much water would be needed for dust suppression. Rover provided a Fugitive Dust Control Plan that details dust suppression measures that would be employed. This Plan states that both municipal sources and "other approved sources" would be used to control dust, but Rover does not identify the individual municipal sources or the "other approved sources." Because use of certain water sources could result in adverse impacts such as those on sensitive or even federally listed threatened or endangered species**, we recommend that:**

- **<u>Prior to construction</u>, Rover file with the Secretary, for the review and written approval by the Director of Office of Energy Projects (OEP), a revised Fugitive Dust Control Plan that identifies by name and approximate intake location (if applicable) each water source that will be used to obtain water used for dust suppression activities.**

TABLE 4.3.2-5

Hydrostatic Test Water Sources and Volumes for the Projects

Project Component	Source	Milepost a	Hydrostatic Testing Volume (gallons) b
ROVER PIPELINE PROJECT			
Pipeline Segments c			
Berne Lateral	Unnamed tributary to South Fork	0.0	504,633
Burgettstown Lateral	Ohio River	0.0	3,514,864
		13.4	2,822,214
	Hale Run	23.9	7,406,664
Cadiz Lateral	Brushy Fork	0.0	638,375
CGT Lateral	Flint Run	0.0	691,773
Clarington Lateral	Cat Run	0.0	6,489,436
	Wheeling Creek	17.8	207,4425
Mainlines A and B	Conotton Creek	18.8	5,888,015
		26.9	9,478,495
	Sandy Creek	35.2	516,160
		39.3	449,415
	Lake at Prairie Lane Road	40.0	516,160
		67.1	7,413,824
	Sugar Creek	47.2	2,230,724
		67.8	3,412,616
	Jerome Fork	77.3	6,406,601
		85.9	13,062,125
	Black Fork Mohican River	104.1	17,278,141
		125.5	717,507
	Sandusky River	127.9	10,197,158
		142.0	20,491,253
	Maumee River	170.3	21,702,126
		200.2	6,656,046
	Crabapple Creek	23.6	3,348,900
Majorsville Lateral	Little Grave Creek	0.0	1,008,901
		8.3	188,030
	Stone Coal Run	10.2	682,437
		16.1	879,347
Market Segment	Municipal Town of Morenci, MI	0.0	10,219,689
		27.8	10,416,123
	Silver Lake	56.4	9,293,739
		82.3	6,196,021
REX Interconnect	South Fork Creek	0.0	68,816
Seneca Lateral	South Fork Creek	0.0	1,992,572
		5.4	7,334,555

TABLE 4.3.2-5 (continued)

Hydrostatic Test Water Sources and Volumes for the Projects

Project Component	Source	Milepost a	Hydrostatic Testing Volume (gallons) b
Sherwood Lateral	Buckeye Creek	0.0	544,532
	Englands Run	0.9	1,790,280
	Nutter Fork	7.7	860,766
	Purgatory Run	10.9	650,273
		13.4	399,416
		14.9	667,785
	Sancho Creek	17.4	3,301,044
	Ohio River	29.8	2,031,105
	Alum Run	36.8	930,661
		40.3	1,567,766
	Sunfish Creek	46.2	954,009
		49.8	675,470
Supply Connector Lines A and B	Clear Fork	0.0	5,032,699
		7.2	8,483,462
Pipeline Segments Total			*230,077,148*
Horizontal Directional Drill Sites			
Burgettstown Lateral			
Ohio River HDD	Ohio River	16.4	349,353 d
Clarington Lateral			
Captina Creek HDD	Municipal	6.0	137,974 d
Interstate 70 HDD	Municipal	18.9	161,617 d
Supply Connectors A and B			
HWY 151 HDD	Municipal	16.3	178,696 d
Mainlines A and B			
Indian Fork HDD	Atwood Lake Overflow	24.8	547,662 d
Sandy Creek HDD	Creek at MP 35.7	35.7	215,254 d
I-77 HDD	Municipal	39.6	225,840 d
Tuscarawas River HDD	Tuscarawas River	42.7	616,826 d
Stream at HWY 241 HDD	Municipal	53.5	273,125 d
Prairie Lane HDD	Unidentified	68.3	284,417 d
Norfolk Southern Railroad HDD	Unidentified	68.9	238,544 d
S Columbus Rd HDD	Municipal	71.5	293,592 d
US HWY 30 HDD	Municipal	76.6	280,183 d
I-71 HDD	Municipal	91.9	187,024 d
HWY 42 HDD	Black Fork Mohican River	94.6	179,966 d
Black Fork HDD	Black Fork River	95.9	266,774 d
CR12 HDD	Silver Creek	135.3	247,013 d
Honey Creek HDD	Unnamed tributary to Wolf Creek	140.3	232,898 d

TABLE 4.3.2-5 (continued) **Hydrostatic Test Water Sources and Volumes for the Projects**			
Project Component	**Source**	**Milepost a**	**Hydrostatic Testing Volume (gallons) b**
Sandusky River HDD	Sandusky River	142.1	242,778 **d**
I-75 HDD	Municipal	170.2	465,795 **d**
State HWY 109 HDD	Municipal	190.9	361,344 **d**
Maumee River HDD	Maumee River	200.7	320,411 **d**
Majorsville Lateral			
Ohio River HDD	Municipal	12.0	57,802 **d**
Market Segment			
State Road 52 HDD	Raisin River	62.1	183,848 **d**
Interstate 94 HDD	Municipal	74.7	143,267 **d**
Portage River HDD	Municipal	84.5	152,795 **d**
Sherwood Lateral			
Highway 50 HDD	Buckeye Creek	1.5	122,753
Road / Middle Island Creek HDD	Purgatory Run	13.4	105,143 **d**
Middle Island Creek HDD	Middle Island Creek	23.7	134,665 8 **d**
Ohio River HDD	Ohio River	35.0	282,279 **d**
Horizontal Directional Drill Site Total			*7,354,973* **d**
Class 3 Pipe			
Clarington Lateral	Wheeling Creek	17.8	2,074,425
Majorsville Lateral	Stone Coal Run	10.2	682,437
Burgettstown Lateral	Ohio River	13.4	2,822,214
Mainlines A and B	Sandy Creek	35.2	516,160
		39.3	449,415
	Sugar Creek	47.2	2,230,724
	Lake at Prairie Lane Road	67.8	3,412,616
	Jerome Fork	85.9	13,062,125
	Black Fork Mohican River	125.5	717,507
Market Segment	Silver Lake	82.3	6,196,021
Class 3 Pipe Total			*32,163,644*
Rover Pipeline Project Total			**265,595,765**
PANHANDLE BACKHAUL PROJECT			
Edgerton Compressor Station	Municipal	--	90,000 **e**
Montezuma Compressor Stations	Municipal	--	130,000 **e**
Tuscola Compressor Station	Municipal	--	50,000 **e**
Zionsville Compressor Station	Municipal	--	130,000 **e**
Panhandle Backhaul Project Total			**400,000**

TABLE 4.3.2-5 (continued)

Hydrostatic Test Water Sources and Volumes for the Projects

Project Component	Source	Milepost a	Hydrostatic Testing Volume (gallons) b
TRUNKLINE BACKHAUL PROJECT			
Bourbon Meter Station	Municipal	--	25,000
Dyersburg Compressor Station	Municipal	--	150,000 e
Independence Compressor Station	Municipal	--	90,000 e
Johnsonville Compressor Station	Municipal	--	135,000 e
Joppa Compressor Station	Municipal	--	90,000 e
Trunkline Backhaul Project Total			**490,000**
ESTIMATED TOTAL (ALL PROJECTS)			**269,710,765**

a Approximate milepost at the beginning of the test segment.
b The amount of water used to pre-clean test segments would vary according to the size of each segment and is not represented in this table.
c Does not include sections of pipeline that would be installed using an HDD.
d Includes water used to hydrostatically test pipeline segments that would be installed using an HDD and water used to create the drilling fluid.
e Estimated volumes of required water is a range. This number reflects the highest number in the range.

TABLE 4.3.2-6

Proposed Hydrostatic Test Water Segments for Rover's Pipeline Facilities

Pipeline Project Component	Test Segment No.	Start MP	End MP	Water Source
Supply Laterals				
Berne Lateral	B-1	0.0	3.8	Unnamed tributary to South Fork
Burgettstown Lateral	B-1	0.0	13.4	Ohio River
	B-2	13.4	23.9	Ohio River
	B-3	23.9	51.7	Hale Run
Cadiz Lateral	C-1	0.0	3.4	Brushy Fork
CGT Lateral	C-1	0.0	5.8	Flint Run
Clarington Lateral	C-1	0.0	17.8	Cat Run
	C-2	17.8	23.6	Wheeling Creek
	C-3	23.6	32.9	Crabapple Creek
Majorsville Lateral	M-1	0.0	8.3	Little Grave Creek
	M-2	8.3	10.2	Little Grave Creek
	M-3	10.2	16.1	Stone Coal Run
	M-4	16.1	23.6	Stone Coal Run
REX Interconnect	R-1	0.0	0.2	South Fork Creek

TABLE 4.3.2-6 (continued)

Proposed Hydrostatic Test Water Segments for Rover's Pipeline Facilities

Pipeline Project Component	Test Segment No.	Start MP	End MP	Water Source
Seneca Lateral	S-1	0.0	5.4	South Fork Creek
	S-2	5.4	25.6	South Fork Creek
Sherwood Lateral	S-1	0.0	0.9	Buckeye Creek
	S-2	0.9	7.7	Englands Run
	S-3	7.7	10.9	Nutter Fork
	S-4	10.9	13.4	Purgatory Run
	S-5	13.4	14.9	Purgatory Run
	S-6	14.9	17.4	Purgatory Run
	S-7	17.4	29.8	Sancho Creek
	S-8	29.8	36.8	Ohio River
	S-9	36.8	40.3	Alum Run
	S-10	40.3	46.2	Alum Run
	S-11	46.2	49.8	Sunfish Creek
	S-12	49.8	52.3	Sunfish Creek
Supply Connector Lines A and B	1-1	0.0	7.2	Clear Fork
	1-2	7.2	18.8	Clear Fork
Mainlines				
Mainlines A and B	2-1	18.8	26.9	Conotton Creek
	2-2	26.9	40.0	Conotton Creek
	2-3	35.2	36.0	Sandy Creek
	2-4	39.3	39.9	Sandy Creek
	3-1	40.0	67.1	Lake at Prairie Lane
	3-2	967.15.7	77.3	Lake at Prairie Lane Road
	3-3	47.2	50.3	Sugar Creek
	3-4	67.8	72.6	Sugar Creek
	4-1	77.3	85.9	Jerome Fork
	4-2	85.9	104.1	Jerome Fork
	4-3	104.1	127.9	Black Fork Mohican
	4-4	125.5	126.5	Black Fork Mohican
	5-1	127.9	142.0	Sandusky River
	5-2	142.0	170.3	Sandusky River
	6-1	170.3	200.2	Maumee River
	6-2	200.2	209.4	Maumee River
Market Segment	7-1	0.0	27.8	Municipal Town of Morenci, MI
	7-2	27.8	56.4	Municipal Town of Morenci, MI
	8-1	56.4	82.3	Silver Lake
	8-2	82.3	100.1	Silver Lake

Water for Horizontal Directional Drilling

As discussed in section 2.3.2.2, Rover would use the HDD method at 30 locations along the proposed pipeline route. Throughout the process of drilling and enlarging the hole, a slurry made of non-toxic/non-hazardous bentonite clay and water, referred to as drilling mud, would be circulated through the drilling tools to lubricate the drill bit, remove drill cuttings, and hold the hole open. Rover has proposed to use water from nearby waterbodies to create the slurry (see table 4.3.2-5). Rover may also use municipal water to create a slurry or purchase slurry. In addition, Rover would require additional water for hydrostatic testing of the individual HDD segments prior to pullback into the reamed hole and has proposed to use the same water sources proposed for the slurry (or municipal water sources). Following testing, the hydrostatic test water would be discharged in accordance with the BMPs described in Rover's Procedures. At HDD sites that would use water obtained from a surface waterbody to create a slurry and/or hydrostatically test the HDD segment, water would be obtained from the waterbody via a cleared path between the HDD entry or exit pit and the water source.

In accordance with Rover's Plan, methods and locations for the collection, containment, and disposal of drill cuttings and fluids would be determined throughout the construction process. The disposal of drilling mud would not result in adverse environmental impacts and would be subject to all applicable landowner or land management agency approval and permit requirements.

4.3.2.6 General Impacts and Mitigation

Pipeline construction could impact surface waters associated with creation of a right-of-way, specific crossing methods, water use, and potential spills. Clearing and grading of streambanks, in-stream trenching, trench dewatering, and backfilling could result in modification of aquatic habitat, increased sedimentation, turbidity, decreased dissolved oxygen concentrations, releases of chemical and nutrient pollutants from sediments, and introduction of chemical contaminants such as fuel and lubricants.

One potential impact on surface waters could result from the temporary increase in sediments mobilized downstream during in-stream construction. The extent of the impact would depend on sediment loads, stream velocity, turbidity, bank composition, and sediment particle size. These factors would determine the density and downstream extent of sediment migration. In-stream construction could cause the dislodging and transport of channel bed sediments and the alteration of stream contours. Changes in the stream bottom contours could alter stream dynamics and increase downstream erosion or deposition. Turbidity resulting from resuspension of sediments from in-stream construction and erosion of cleared right-of-way areas could reduce light penetration and photosynthetic oxygen production. In-stream disturbance could also introduce chemical and nutrient pollutants from sediments. Resuspension of deposited organic material and inorganic sediments could cause an increase in biological and chemical use of oxygen, potentially resulting in a decrease of dissolved oxygen concentrations in the affected area. Lower dissolved oxygen concentrations could cause temporary displacement of motile organisms, such as fish, and may kill non-motile organisms within the affected area.

The clearing and grading of streambanks could expose soil to erosional forces and would reduce riparian vegetation along the cleared section of the waterbody. The use of heavy equipment for construction could cause compaction of surface soils, an effect that could result in increased runoff into surface waters in the immediate vicinity of the proposed construction right-of-way. Increased surface runoff could transport sediment into surface waters, resulting in increased turbidity levels and increased sedimentation rates in the receiving waterbody. Disturbances to stream channels and streambanks could also increase the likelihood of scour after construction.

Refueling of vehicles and storage of fuel, oil, or other hazardous materials near surface waters could create a potential for contamination. If a spill were to occur, immediate downstream users of the water could experience degradation in water quality. Acute and chronic toxic effects to aquatic organisms could also result from such a spill.

None of the applicants anticipate the need for blasting along the Project route or within streams; therefore, any associated impacts on water resources (e.g., injury or death aquatic organisms, displacement of organisms during blast-hole drilling operations, and temporary increases in stream turbidity) would not occur. Although it does not plan to conduct blasting activities along the pipeline route, Rover developed a Blasting Plan to minimize potential adverse impacts on the environment, nearby water sources, structures, and utilities, should blasting be required (see appendix G).

Seasonal and flash flooding hazards are a potential concern where the pipeline would cross or be near major streams and small watersheds. Additional discussion regarding flooding and flash floods is also provided in section 4.1.3. Although flooding itself does not generally present a risk to pipeline facilities, bank erosion and/or scour could expose the pipeline or cause sections of pipe to become unsupported. All pipeline facilities are required to be designed and constructed in accordance with DOT's regulations in 49 CFR 192. These regulations include specifications for installing the pipeline at a sufficient depth to avoid possible scour at waterbody crossings. The trench would be sufficiently deep to provide for a minimum of 5 feet of cover over the pipeline at waterbodies.

To address these general impacts, Rover would implement several mitigation measures within floodplains to minimize potential impacts from flood events. These measures include:

- adherence to its Spill Procedures to minimize the likelihood of the occurrence of any spills and the extent of impacts if a spill were to occur;
- clearing only the vegetation needed for safe construction of the pipeline;
- installing and maintaining erosion and sediment control structures;
- installing concrete pipe coating or concrete weights on pipe within waterbodies and/or floodplains to prevent possible floating of the pipe;
- restoring floodplain contours and waterbody banks to their pre-construction condition; and
- conducting post-construction monitoring to ensure successful revegetation.

Operation of aboveground facilities would result in a minor increase in impervious surfaces. Rover would implement appropriate stormwater management measures in accordance with federal and state requirements. With implementation of these measures, the impacts from increased stormwater runoff are expected to be minor.

Open-cut Crossings

Rover proposes to cross the majority of waterbodies and drainages using the open-cut method. Section 2.3.2.2 provides a description of waterbody crossing methods. Construction-related impacts associated with the use of open-cut crossings would be limited primarily to temporary periods of increased turbidity during the crossing and the resultant sedimentation. Increases in turbidity could affect aquatic flora and fauna, but any impacts would be temporary and limited to the duration of construction activities. Sedimentation would occur when the sediments suspended during Project construction resettle. Sedimentation can cause smothering of aquatic biota and habitat degradation. Mobile organisms would be expected to avoid the area during construction and would therefore not be impacted by construction activities. Less mobile and sessile organisms would not be able to avoid the construction area and could be adversely impacted by changes in water quality. Rover would minimize impacts on waterbodies, watersheds, and nearby reservoirs during construction by implementing the construction and mitigation procedures contained in its Procedures, which include:

- constructing the crossing as close to perpendicular to the waterbody as site conditions allow;
- maintaining adequate flow rates throughout construction to protect aquatic life and prevent the interruption of existing downstream uses;
- requiring construction across waterbodies to be completed as quickly as possible;
- requiring temporary erosion and sediment control measures to be installed across the entire width of the construction right-of-way after clearing and before ground disturbance;
- requiring maintenance of temporary erosion and sediment control measures throughout construction until streambanks and adjacent upland areas are stabilized;
- requiring bank stabilization and reestablishment of bed and bank contours and riparian vegetation after construction; and
- implementing Rover's Spill Procedures if a spill or leak occurred during construction.

Given the impacts on fisheries that could occur as a result of the open-cut method, we have recommended that Rover use dry-ditch methods instead of open-cut methods for all crossings of waterbodies designated as coldwater fisheries or exceptional warmwater habitat except those being crossed by an HDD (see section 4.3.2.5).

During construction, the open trench may accumulate water, either from the seepage of groundwater or from precipitation. Where necessary, Rover would dewater the trench in a manner that would not result in silt-laden water entering waterbodies or wetlands and would not cause erosion, as described in Rover's Procedures. This process would prevent heavily silt-laden water from flowing into any adjacent waterbodies or wetlands.

Long-term impacts associated with pipeline operations and maintenance would be relatively minor. Rover would stabilize streambanks within 24 hours of completion of construction and revegetate following installation of the pipeline. Post-construction vegetation maintenance would be limited to the permanent right-of-way pursuant to Rover's Procedures.

Dry-Ditch Crossings

In response to our recommendation in the draft EIS, Rover is proposing to cross all perennial waterbodies that support coldwater fisheries or exceptional warmwater habitat using dry-ditch methods. In addition, Rover would use dry-ditch methods to cross ephemeral or intermittent tributaries to these perennial coldwater fishery and exceptional warmwater waterbodies if flow was present in them at the time of construction. Section 2.3.2.2 provides a description of waterbody crossing methods. Temporary construction-related impacts associated with the use of dry crossing methods would be limited primarily to short periods of increased turbidity before installation of the pipeline during the assembly of the upstream and downstream dams and following installation of the pipeline when the dams are removed and flow across the restored work area is re-established.

Horizontal Directional Drill Crossings

The potential impacts on waterbodies associated with the use of HDD crossing methods are considered minimal when compared to other crossing methods, because the waterbody and its banks would not be disturbed by clearing or trenching; rather, the pipe would be installed below the feature. There is the risk of an inadvertent release of drilling fluids; this is commonly known as a frac-out. Rover would continuously monitor drilling operations for signs of a frac-out. In the event that a frac-out occurs, Rover would employ measures set forth in its HDD Contingency Plan to control the release and avoid or minimize associated environmental impacts (see appendix G). Workspaces required to accommodate the HDD would be on both sides of the waterbody and would include appropriate erosion and sedimentation control devices designed to prevent the migration of any soil towards the adjacent waterbody. In addition, a 10-foot-wide access path between the HDD entry or exit pit and the source of water used to create the slurry and/or hydrostatically test the HDD pipe segment would be required in some areas.

Access Roads

Some of the temporary and permanent access roads required for the Rover Project would be newly constructed or require improvements to the existing road, such as widening, the addition of gravel to accommodate the movement of equipment and materials, replacement/installation of culverts, and removal of overhanging vegetation. Rover would minimize potential impacts on waterbodies and drainages by installing and maintaining erosion control devices, where appropriate.

Five new access roads would be constructed across waterbodies. Rover would install equipment bridges or bridges with flumes as depicted in appendix D. No new temporary or permanent access roads would be required for the Panhandle or Trunkline Projects. Construction and operation of new access roads, along with some of the modifications to existing access roads, would increase the amount of impervious surface in the immediate areas of the access roads. A reduction of pervious surface can lead to increases in stormwater runoff and the resultant effects on surface water quality. However, because any increases in impervious surface due to the construction and operation of access roads would be localized and predominantly temporary in nature, we do not expect impacts on surface waters to be significant.

Hydrostatic Testing and Dust Control

As discussed in section 4.3.2, Rover estimates that approximately 266 million gallons of water would be needed for hydrostatic testing. The majority of these withdrawals would take place within surface waterbodies. Panhandle estimates that a maximum of 400,000 gallons of water would be needed for hydrostatic testing of its Project, while Trunkline estimates a maximum of 490,000 gallons would be needed. Panhandle and Trunkline would use water obtained from municipal sources and trucked to the sites for their hydrostatic testing activities.

The withdrawal of large volumes of water from surface water sources could temporarily affect the recreational and biological uses of the resource if the diversions constitute a large percentage of the source's total flow or volume. Water withdrawals could also result in temporary loss of habitat, change in water temperature and dissolved oxygen levels, and entrainment or impingement of fish or other aquatic organisms. In section 4.3.2.5 we are recommending that Rover submit for our approval a revised Fugitive Dust Control Plan that identifies each water source along with the approximate location of withdrawal that would be used for dust suppression. Additionally, Rover would minimize the potential effects of water withdrawals from surface water sources by adhering to the measures in its Procedures. Rover would maintain base flows during all withdrawals, screen intake hoses, regulate the rate of withdrawal of test water to prevent the entrainment of fish and other aquatic organisms, and discharge test waters in a manner that would not cause erosion or cause silt-laden water to enter wetland or waterbody.

The Projects would have water trucks present during construction for dust control, if needed. It is unknown how much water would be used as this would depend on the conditions at the time of construction. The applicants would obtain all appropriate permits and authorizations required prior to conducting any dust control activities and we are recommending that they submit a list of water intake locations for our approval. Therefore, we conclude that impacts on surface waters from withdrawal of test and dust control water would be minimized and not significant. Section 4.6 further discusses the potential impacts from water withdrawal on aquatic species. Additionally, Rover would acquire the necessary permits and approvals from federal and state agencies.

Hazardous Material Spills

Accidental spills and leaks of hazardous materials associated with equipment trailers; the refueling or maintenance of vehicles; and the storage of fuel, oil, and other fluids can have immediate effects on aquatic resources and could contaminate a waterbody downstream of the release point. Rover would implement its Procedures, and Panhandle and Trunkline would adhere to the FERC's Procedures, both of which avoid or minimize impacts associated with spills or leaks of hazardous liquids by restricting the location of refueling and storage facilities (at least 100 feet from a wetland or waterbody) and by requiring containment and cleanup in the event of a spill or leak.

Additionally, implementation of the measures in Rover's Spill Procedures and Panhandle and Trunkline's SPARs would minimize the potential for surface water impacts associated with an inadvertent spill of hazardous materials. These plans include the use of secondary containment structures for petroleum products, weekly inspection of hazardous waste containers and drums, and the on-site presence of supplies that would be used for rapid containment and recover should a release occur (e.g., absorbent materials, barrier materials, DOT-approved containers). Rover's Spill Procedures and the other applicants' SPARs also specify measures to contain, clean up, and report a spill. Implementation of the measures outlined by the applicants would adequately address the storage and transfer of hazardous materials and petroleum products, and the appropriate response in the event of a spill.

4.3.2.7 Extra Workspaces within 50 Feet of Waterbodies

As discussed in section 2.3, our Procedures stipulate that all extra workspaces should be at least 50 feet from waterbodies. Rover has identified certain areas where site-specific conditions do not allow for a 50-foot setback. Appendix E identifies these locations and the reasons why Rover stated the extra workspaces are justified. Based on our review, we find that all of Rover's requests are justified. Section 2.3 provides additional discussion on this topic.

4.3.3 Conclusion

No long-term impacts on surface waters are anticipated as a result of the proposed Projects, and temporary impacts would not be significant based on proposed construction methods, proposed mitigation, and adherence to our recommendations. The Rover pipeline would not permanently affect the designated water uses, since it would be buried beneath the bed of all waterbodies. Rover would implement its erosion controls and would restore the streambanks and streambed contours as close as practical to pre-construction conditions. Further, we have recommended that Rover use dry-ditch methods instead of open-cut methods for all crossings of coldwater fisheries and exceptional warmwater habitat, except those being crossed by an HDD (see section 4.3.2.5). The Panhandle and Trunkline Projects would not cross any waterbodies, have adopted the FERC's Plan and Procedures, and developed SPARs to avoid impacts on waterbodies in areas adjacent to construction workspace.

Standard operation and maintenance of the Projects would not cause impacts on any surface waters; unexpected maintenance activities could involve pipe excavation and repair in or near waterbodies in the future. For maintenance activities if needed, the applicants would employ protective measures similar to those proposed for use during construction in accordance with all permits. As a result, any impacts derived from maintenance would be expected to be temporary to short-term and similar to those discussed above for the initial construction period.

4.4 WETLANDS

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions (Environmental Laboratory, 1987). Examples of wetlands include swamps, marshes, and bogs. Wetlands serve important biological, physical, and chemical functions, including providing wildlife food, habitat, recreation opportunities, flood control, and water quality improvement.

In the Rover Project area, wetlands are regulated at both the federal level (COE) and at the state level by the MIDEQ, the OHEPA, the WVDEP, and the PADEP. The COE's jurisdiction in the Rover Project area within Michigan has been delegated to the MIDEQ. Under Section 404 of the CWA, the COE is authorized to issue permits for activities that would result in the discharge of dredge or fill material into waters of the United States such as wetlands. Michigan, Ohio, West Virginia, and Pennsylvania are required by Section 401 of the CWA to certify that proposed dredging or filling of waters of the United States meets state water quality standards.

The Panhandle and Trunkline Projects would not affect wetlands, therefore these Projects are not discussed below.

4.4.1 Existing Wetland Resources

Rover identified and delineated wetlands in the Rover Project area during field surveys conducted along 100 percent of the pipeline route. Wetland boundaries were delineated using the methods described in the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) (COE, 2012a), Eastern Mountains and Piedmont Region (Version 2.0) (COE, 2012b), and Midwest Region (Version 2.0) (COE, 2010). Surveyed areas consist of a 400-foot-wide corridor along the proposed pipeline route that includes the construction and permanent rights-of-way, temporary workspaces for the pipeline and aboveground facilities, and a 50-foot-wide corridor along proposed access roads.

On February 20, 2015, Rover submitted Joint Permit applications to the COE Detroit District Office and MIDEQ Lansing and Jackson District Office. In addition, Wetland Delineation Reports were submitted to the COE Pittsburgh District (Ohio, West Virginia, and Pennsylvania), the COE Huntington District (Ohio and West Virginia), the COE Detroit District (Michigan), and the MIDEQ Lansing and Jackson Districts. As part of its application for a Department of the Army Nationwide Permit Number 12, Rover requested jurisdictional determinations for the waterbodies and wetlands identified within the Rover Project work areas. In June 2015, Rover submitted addendum reports to the corresponding COE District Offices (Huntington, Pittsburgh, and Buffalo) and the MIDEQ to identify waters of the United States surveyed within the Project area between November 1, 2014 and May 12, 2015. On April 20, 2016, the COE Huntington District issued a preliminary jurisdictional determination.

Appendix M identifies the location, National Wetlands Inventory (NWI) classification, crossing length, and acreage of each wetland that would be crossed or otherwise affected by the Rover Project.

4.4.1.1 Pipeline Facilities

The pipeline facilities associated with the Rover Project consist of nine Supply Laterals, Mainlines A and B, and the Market Segment. The Supply Laterals include Sherwood Lateral, CGT Lateral, Seneca Lateral, Berne Lateral, Clarington Lateral, Majorsville Lateral, Cadiz Lateral, Burgettstown Lateral and the Supply Connector Lines A and B. About 24 percent of the pipeline route would be collocated with or adjacent to existing rights-of-way for other linear facilities. Overall, about 60 percent of the pipeline route would be within agricultural land.

The pipeline facilities and extra workspaces would affect a total of 159.68 acres of wetlands during construction, including 0.92 acre in Pennsylvania, 1.47 acres West Virginia, 89.69 acres in Ohio, and 67.62 acres in Michigan. Of those impacts, 70.89 acres (0.44 acre in Pennsylvania, 0.68 acre in West Virginia, 43.12 acres in Ohio, and 26.65 acres in Michigan) would be associated with operation of the Rover Project.

4.4.1.2 Aboveground Facilities

As described in section 2.0, aboveground facilities associated with the Rover Project include 10 new compressor stations, 21 new meter stations, 6 new tie-in facilities, 77 mainline valves, and 11 pig launcher and receiver facilities. Of the aboveground facilities, only the construction of the Defiance Compressor Station would affect wetlands; specifically, 0.33 acre of emergent wetland would be impacted. Of this, 0.17 acre would be permanently filled for operation of the facility. The remaining 0.16 acre would be restored to pre-construction conditions.

4.4.1.3 Contractor Yards

Rover proposes to use 13 contractor yards on a temporary basis for equipment, pipe sections, construction material, and supply storage, as well as temporary field offices, parking, pipe preparation, and pre-assembly staging areas. Where feasible and available, Rover would lease previously disturbed or existing areas for this purpose. There would be no wetlands affected by contractor yards.

4.4.1.4 Access Roads

In addition to public roads, Rover proposes to use 231 private access roads along the pipeline route (1 in Pennsylvania, 73 in West Virginia, 134 in Ohio, and 23 in Michigan) to construct the pipeline (see maps in appendix B). Of these 231 roads, 145 are existing roads, 37 would be a combination of existing and new roads, and 49 would be newly constructed. Rover proposes to maintain 59 of the 231 roads permanently for Project operation.

No new permanent access roads would be installed across wetlands, although potential trimming of branches may occur to allow construction equipment to use existing roads though forested wetlands. Existing access roads across wetlands have existing bridges already in place.

4.4.1.5 Wetland Types

Wetland types were assigned based on the NWI classification hierarchy described in Classification of Wetlands and Deepwater Habitats in the United States (Cowardin et al., 1979). Wetlands crossed by the Rover Project are classified as palustrine (freshwater wetland) and are defined by their dominant vegetation layer (emergent, scrub-shrub, or forested), as described below.

4.4.1.6 Palustrine Forested Wetlands

Palustrine forested wetlands in the Rover Project area are dominated by trees and shrubs at least 20 feet tall with a tolerance to a seasonally high water table (Cowardin et al., 1979). Forested wetlands typically have a mature tree canopy with a diverse range of understory and herbaceous community structure and species. Wetland tree species identified in in the area of the pipeline include maples, ash, elm, oaks, and pine.

4.4.1.7 Palustrine Scrub-Shrub Wetlands

Palustrine scrub-shrub wetlands identified in the area of the Rover Project are typically shrub swamps at the transition between herbaceous (emergent) and forested habitats. Palustrine scrub-shrub wetlands are dominated by shrubs and saplings less than 20 feet tall (Cowardin et al., 1979). Scrub-shrub wetlands may represent a relatively stable climax community or a successional stage leading to a forested wetland. Shrub species identified in delineated wetlands include willows, dogwoods, elms, buttonbush, arrowwood, and a variety of sedges and grasses including reed canary grass (an invasive species).

4.4.1.8 Palustrine Emergent Wetlands

Palustrine emergent wetlands are characterized by erect, rooted, herbaceous plants suited to growing in wet conditions (Cowardin et al., 1979). The wetlands along the route are typical marshes and wet meadows, commonly associated with isolated depressions, lakes, shallow slow flowing rivers, and ponds. Vegetation observed during field investigations include reed canary grass, lamp rush, rice cutgrass, cattails, sensitive fern, spotted touch-me-not, late goldenrod, spotted trumpetweed, common boneset, and a variety of sedges.

4.4.1.9 State Wetland Classifications

Pennsylvania

None of the wetlands crossed by the Rover Project in Pennsylvania are classified as wetlands of EV, which are given special protection in the state of Pennsylvania by the PADEP.

West Virginia

No wetlands of EV have been identified in the Rover Project area in West Virginia.

Ohio

Rover did not identify any wetlands of EV in Ohio. However, during our ongoing agency consultations, the COE Huntington District indicated that the Project would impact Category 3 wetlands. Category 3 wetlands are determined by the OHEPA's Ohio Rapid Assessment Methods for Wetlands. These wetlands are defined as those that have superior habitat or superior hydrological or recreational functions and typically have high levels of diversity, high proportion of native species, and/or high functional values (OHEPA, 2001).

Michigan

The Michigan Natural Heritage Program (MINHP) identified inundated shrub swamp, bog, and prairie fen as having the potential to occur within the Rover Project area, but did not identify any areas where they would be impacted by the Project. The MINHP indicated that these wetland types are assigned the following status:

- Inundated Shrub Swamp (S3) – Rare or uncommon in state (on the order of 21 to 100 occurrences);
- Bog (S4) – Apparently secure in state, with many occurrences; and
- Prairie fen (S2) – Imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation from the state.

4.4.2 Wetland Construction Procedures

Construction of the Rover Project would impact a total of 160.01 acres of wetland within the Rover Pipeline right-of-way and extra workspaces. Construction would be conducted in accordance with Rover's Procedures and as described in section 2.3.2.1.

The pipeline construction right-of-way width would vary depending on the type of wetland and the size of the pipeline. Table 4.4.2-1 outlines the varying construction right-of-way widths proposed by Rover.

TABLE 4.4.2-1

The Rover Pipeline Project Construction Rights-of-Way Widths

Construction Right-of-Way Width	Pipeline Diameter	Wetland Type
75 feet	Single 24-inch	All wetlands
75 feet	Single 30-, 36-, or 42-inch	Forested wetlands
120 feet	Dual 42-inch	Non-forested
100 feet	Single 30-, 36-, or 42-inch	Non-forested
95 feet	Dual 42-inch	Forested

Rover would determine the construction method based on soil stability and other related conditions such as saturation at the time of construction; however, Rover anticipates that the open-cut trenching method would likely be used for non-saturated wetlands.

Where soils are stable and not saturated at the time of crossing, the pipeline would be installed using methods similar to those in uplands. Trees would be cut to grade, but stumps would only be removed from the trenchline and from the working side of the trench where necessary for safety. In accordance with Rover's Procedures, Rover would segregate and then replace up to 12 inches of topsoil from the trench where the hydrologic conditions permit. In order to prevent excessive rutting in wetlands, Rover would use low ground pressure equipment or would install temporary board or timber mats. Additional protection methods in these wetlands would include the use of erosion control measures such as silt fences, inceptor dikes, and straw/hay bale structures that would be installed and maintained to minimize sedimentation into areas outside of the right-of-way. Where necessary, trench plugs would be installed to prevent the draining of water from the wetland.

Where wetland soils are saturated, Rover would utilize equipment mats or timber mats to facilitate equipment movement through the wetland. Topsoil would not be segregated if soils are saturated or inundated. With the exception of topsoil segregation, construction would be similar to methods described for unsaturated wetlands.

Rover's proposed HDD crossings would avoid impacts on 18 wetlands including 14 forested, 1 scrub-shrub, and 3 emergent wetlands. Use of the HDD crossing methods would eliminate the need for trenching and operation of heavy construction equipment within the wetland. Additional details on HDD crossing methods are discussed in section 2.3.2.2.

4.4.3 General Impacts and Mitigation

Table 4.4.3-1 summarizes the wetland acreage impacted by the Rover Project. Construction of the Project would impact a total of 160.01 acres of wetland, including 33.35 acres of forested wetlands, 29.29 acres of scrub-shrub wetlands, and 97.37 acres of emergent wetlands. The majority of the Project's wetland impacts would result from construction within temporary workspaces (88.51 acres); these temporarily affected wetlands would return to pre-construction conditions following construction.

Rover would maintain 10- and 30-foot-wide corridors in wetlands for areas of single pipeline and dual pipelines, respectively. Rover would also selectively remove trees and shrubs within 15 feet of the pipeline centerline. In total, operation of the Rover Project would impact 71.51 acres of wetlands; however, emergent and scrub-shrub wetlands would be allowed to re-vegetate naturally. Alternatively, 14.23 acres of forested wetlands would be within the operational right-of-way and would therefore be permanently converted to emergent or scrub-shrub wetlands.

The impacts of construction on wetland vegetation would range from temporary impacts on emergent vegetation to permanent alteration of forested wetland vegetation. Other impacts on wetlands could include temporary changes in hydrology and water quality during construction. Temporary removal of wetland vegetation during construction could alter the capacity of wetlands to function as habitat, flood, and erosion control buffers.

Mixing of topsoil with subsoil could alter nutrient availability and soil chemistry, thereby inhibiting recruitment of native wetland vegetation. Heavy equipment operating during construction could result in soil compaction or rutting that would alter natural hydrologic and soil conditions, potentially inhibiting germination of native seeds and the ability of plants to establish healthy root systems. Additionally, discharges from stormwater, dewatering structures, or hydrostatic testing could transport sediments and pollutants into wetlands, affecting water quality.

The majority of the impacts on wetlands from the pipeline would be temporary and short-term. Rover would restore all wetlands to pre-construction land contours and hydrology. Herbaceous wetland vegetation would regenerate quickly, typically within 1 to 3 years, and emergent wetlands would not be subject to vegetation maintenance. Impacts on forested and scrub-shrub wetlands within the construction right-of-way and temporary workspaces would be long-term, because woody vegetation would take several years or more to regenerate.

Rover would also avoid impacts on 2 wetlands in Michigan and 16 wetlands in Ohio through the use of HDDs. Rover would limit activities between the HDD entry and exit points to surface impacts only. Rover originally proposed to clear vegetation within a 10-foot-wide corridor between the trenchless crossing entry and the exit location along the centerline for the purposes of accessing water to support drilling operations or for use as a travel lane. Several of these access paths would require the clearing of forested lands. However, we conclude that for the construction of the HDD crossings, the acquisition of water (including locating pumps to transport acquired water) can be completed without clearing trees along the alignment. Therefore, to avoid unnecessary impacts and to limit disturbance to the minimum area needed to construct the trenchless crossings, **we recommend that:**

- **<u>During construction of the Project</u>, Rover should not clear any trees between the workspaces for HDD entry and exit sites. Rover may conduct minor brush clearing, less than 3 feet wide, using hand tools only, to facilitate the use of the HDD tracking system or acquisition of water for makeup of the HDD slurry. <u>During operation</u>, Rover should not conduct any routine vegetation maintenance along the HDD segments.**

TABLE 4.4.3-1

Wetland Acreages Affected by the Construction and Operation of the Rover Pipeline Project a b c

Facility	Wetland Type: Palustrine Forested Wetland		Palustrine Scrub-Shrub Wetland		Palustrine Emergent Wetland		Total Wetland Area Affected (Construction)	Total Wetland Area Affected (Operation)
	Construction	Operation	Construction	Operation	Construction	Operation		
Berne Lateral	0.00	0.00	0.05	0.04	<0.01	<0.01	0.06	0.05
Berne/Seneca Lateral	0.00	0.00	0.00	0.00	0.41	0.25	0.41	0.25
Burgettstown Lateral	0.24	0.15	5.60	2.41	3.19	1.62	9.03	4.18
Cadiz Lateral	0.00	0.00	0.00	0.00	0.19	0.08	0.19	0.08
CGT Lateral	0.00	0.00	0.00	0.00	<0.01	0.00	<0.01	0.00
Clarington Lateral	0.34	0.21	0.58	0.18	3.82	1.71	4.73	2.10
Defiance Compressor Station	0.00	0.00	0.00	0.00	0.33	0.17	0.33	0.17
Mainlines A and B	19.15	11.62	2.60	1.22	38.00	15.75	59.75	28.59
Majorsville Lateral	0.00	0.00	0.00	0.00	0.54	0.38	0.54	0.38
Market Segment	12.34	7.81	20.02	6.74	40.94	15.87	73.29	30.40
Seneca Lateral	0.05	0.03	0.08	0.02	2.79	1.23	2.92	1.28
Sherwood Lateral	0.51	0.29	0.24	0.11	1.76	0.73	2.51	1.13
Supply Connector Lines A and B	0.73	0.47	0.13	0.07	5.39	2.35	6.25	2.90
TOTAL	**33.35**	**20.59**	**29.29**	**10.78**	**97.37**	**40.13**	**160.01**	**71.51**

a Construction impacts include the right-of-way width and all workspace and extra workspace.

b Operational impacts include the 10-foot-wide corridor of vegetation maintenance within the pipeline right-of-way with a single Rover pipeline and a 30-foot-wide corridor where there would be dual Rover pipelines. In forested wetlands, trees would be removed within 15 feet of the centerline resulting in a permanent 30-foot-wide corridor through forested wetlands with a single Rover pipeline and a 50-foot-wide corridor through forested wetlands for dual Rover pipelines.

c Construction and operation maintenance within the right-of-way would not result in the permanent loss of wetlands.

After issuance of the draft EIS, we received a comment from the CONSOL Mining Company indicating that the proposed route would cross a stream and wetland mitigation site at MP CLL 27.8. CONSOL's comments describe that it funded mitigation activities in accordance with a Section 401 permit issued by the OHEPA and a Section 404 permit issued by the COE in 2001 to offset impacts associated with CONSOL's mining activities. As described by CONSOL, it developed a mitigation plan that was approved by the OHEPA and the COE, which stipulated that restoration of the site would be monitored for a period of 5 years. CONSOL is currently in its second year of this monitoring. Additionally, the Section 401 permit places restrictions on the activities that may occur within a mitigation area, including any industrial or construction activities. CONSOL's permits also required plantings of certain tree and shrub species within the mitigation areas. Rover provided a response to the issues outlined in CONSOL's comments stating that Rover would follow the measures outlined in its Plans and Procedures to minimize impacts on the mitigation area. However, given the deeded restrictions outlined in CONSOL's permits and mitigation plan which include prohibitions on cutting of vegetation, and the requirement to plant trees and shrubs, we conclude that adherence to Rover's Plan and Procedures alone would not resolve or eliminate this issue. Therefore, **we recommend that:**

- **<u>Prior to construction</u>, Rover should adopt the alternative route at MP CLL 27.8 as identified in table 3.4.3-3 and as depicted in appendix I2 of the EIS or provide documentation from the OHEPA and the COE describing how Rover's proposed route would not conflict with or result in a violation of any terms and conditions of the Clean Water Act permits issued to the CONSOL Mining Company.**

During operations, Rover would limit permanent impacts on wetlands to a 10-foot-wide maintained corridor for a single pipeline and a 30-foot-wide maintained corridor for the dual pipelines. Additionally, Rover would selectively clear forested wetland vegetation within 15 feet of the centerline. The remainder of forested and scrub-shrub wetlands in those habitats would be allowed to return to pre-Project vegetation conditions.

Rover would mitigate for wetland impacts by implementing its Procedures. Specific measures Rover would implement include:

- minimization of riparian clearing to the extent feasible while ensuring safe construction conditions;
- confinement of stump removal to the trenchline and working side of the construction right-of-way to minimize soil disturbance (unless safety or access conditions require stump removal elsewhere) to facilitate the regrowth of woody vegetation;
- expedition of construction in and around wetlands;
- return of wetland contours and drainage patterns to their original configurations to the extent possible;
- permanent stabilization of upland areas near wetlands within the area disturbed by trenching to preserve the native seed source (which would facilitate natural regrowth of herbaceous vegetation once pipeline installation is complete); and
- periodic inspection of the construction corridor during and after construction.

In accordance with the Rover Procedures, Rover would conduct routine wetland monitoring for a minimum of 3 years and submit quarterly reports to the FERC on the status of wetland restoration and vegetation growth. Based upon the status of success of restoration, additional restoration activity, monitoring, or mitigation could be required to be carried out until wetland restoration is deemed satisfactory. In addition, Rover would adhere to any conditions that may be imposed associated with its pending Section 404 and 401 permits during construction and operation.

4.4.4 Alternative Measures

The FERC Procedures specify that the construction right-of-way in wetlands should be limited to 75 feet wide. However, Rover has requested a wider construction right-of-way for 329 of the 548 wetlands that would be crossed by the Project.

In the draft EIS, we recommended that Rover provide additional justification for those wetlands where it proposed a construction right-of-way width larger than 75 feet. Rover provided its response in March 2016. Based on our review of Rover's response, we conclude that its request for a 95-foot-wide construction right-of-way in forested wetlands along Mainlines A and B is justified for construction of the dual pipeline segments. However, for the remaining wetlands we found the justifications unacceptable (as detailed in table 2.3-1). Therefore, **we recommend that:**

- **<u>Prior to construction,</u> Rover should file revised alignment sheets that limit its construction right-of-way width in areas of dual pipeline to 95 feet and in areas of single pipeline to 75 feet in all wetlands.**

Based on our recommendation that Rover limit the width of its right-of-way width above, impacts on wetlands would decrease by more than 20 acres.

The FERC Procedures specify that extra workspace should not be within 50 feet of wetlands except where an alternative measure has been requested by Rover and approved by the FERC. Areas where Rover has requested extra workspace and stated that a 50-foot setback from wetlands is infeasible (including its justification), are identified in appendix E. We have reviewed these and deem them acceptable, as discussed in section 2.3.

The FERC Procedures specify that a corridor centered on the pipeline and up to 10 feet wide may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. Rover has proposed to clear vegetation within a 30-foot corridor where dual 42-inch-diameter pipe would be installed, which has been deemed acceptable as discussed in section 2.3.

Finally, Rover states it would consult with appropriate federal or state agencies to develop a Project-specific wetland restoration plan. Revegetation and noxious weed control for all states are discussed in Rover's Plans and Procedures and in the AIMP developed for Michigan and Ohio. Rover proposes to restore wetlands with seed and mulch based upon specifications established by the affected states, the COE, and/or other applicable agencies. Following construction, Rover would ensure that all disturbed areas are successfully revegetated. Revegetation would not be considered successful until the following criteria are met:

1. the affected wetland satisfies the current federal definition for a wetland;
2. vegetation is at least 80 percent of either the cover documented for the wetland prior to construction, or at least 80 percent of the cover in adjacent wetland areas that were not disturbed by construction;
3. the plant species composition is consistent with early successional wetland plant communities in the affected ecoregion; and
4. invasive species and noxious weeds are absent, unless they are abundant in adjacent areas that were not disturbed by construction.

Rover's mitigation measures to control invasive species during construction are described in section 4.5.4. Three years after construction, Rover would be required to file a report with the Secretary identifying the status of wetland revegetation efforts and documenting success, as defined above. Where revegetation is not successful at the end of 3 years, Rover would develop and implement remedial revegetation plans, in consultation with a professional wetland ecologist, to actively revegetate any wetland and continue revegetation efforts and file annual reports until wetland revegetation is successful.

4.4.5 Compensatory Mitigation

Rover did not provide compensatory wetland mitigation plans as part of its applications for Section 404 Nationwide Permit Number 12 Permits to the COE, PADEP, MIDEQ, OHEPA, or WVDEP. However, Rover has been in consultation with these federal and state agencies regarding the possible mitigation options available and has provided a conceptual plan of mitigation possibilities for each state. Rover anticipated finalizing the compensatory mitigation plan for the Project with the COE and MIDEQ by the fourth quarter 2015. However, this has not yet been completed.

Pennsylvania

Pennsylvania currently provides three possible methods to compensate for unavoidable impacts on waters including:

- permittee responsible mitigation;
- purchasing credits from an approved mitigation bank; and
- making a payment to the Pennsylvania Wetland Replacement Project.

At this time, Rover proposes to either make a payment to the current Pennsylvania in lieu fee (ILF) program or purchase mitigation credits from the Enlow Fork Mitigation Bank.

West Virginia

Rover has agreed to pay into the West Virginia ILF program. This program was established by the WVDEP to offset unavoidable impacts on waters of the United States and state waters including wetlands, streams, and associated buffers, and to provide mitigation when no mitigation banks are available (WVDEP, 2014b).

Ohio

Rover would either purchase credits from an approved mitigation bank, make a payment into an approved ILF program, or a combination of both options to offset impacts caused by the Rover Project. The banks and ILF programs that exist in Ohio are as follows:

- Ben's Acres Mitigation Bank;
- Reservoir Road Mitigation Bank;
- Crystal Springs Mitigation Bank;
- Sugar Creek-Brewster Site ILF Program;
- Little Stillwater ILF Program;
- Ohio Wetlands Foundation ILF Program; and
- The Nature Conservancy Program ILF Program.

Michigan

Currently there are no mitigation banks or ILF programs available in the HUC 8 watershed that could be used as compensatory mitigation for the Rover Project. According to the MIDEQ, new mitigation banks are expected to be approved in either late 2015 or early 2016. If these banks are not available, Rover proposes to develop a Project-specific wetland mitigation plan that would include the purchase of mitigation credits from agency-approved mitigation banks for other watersheds and permittee-responsible mitigation.

4.4.6 Conclusion

Construction of the Rover Project would impact a total of 160.01 acres of wetlands, of which 71.51 acres would be within the permanent right-of-way. All emergent and scrub-shrub wetlands impacted by the Project would be allowed to revegetate naturally. The 14.23 acres of forested wetlands within the permanent right-of-way would be converted to emergent or scrub-shrub, as no trees would be allowed to regrow. Additionally, while the remaining 6.36 acres of forested wetlands outside of the permanent right-of-way would be allowed to revegetate, it could take years to decades to revert to pre-construction conditions. With adherence to the Rover Procedures, and COE and state agency requirements, including agency-approved compensatory mitigation, as well as our recommendations, we conclude that impacts on wetlands would be minimized. While adverse and long-term impacts on wetlands would occur, we conclude the impacts would be reduced to less than significant levels.

4.5 VEGETATION

4.5.1 Existing Vegetation Conditions

Four major vegetation cover types currently exist in the Rover Project area: upland forests, agricultural lands, open lands, and wetlands. Each land cover type is comprised of a unique composition of plant species and wildlife habitat values. Developed lands include residential, commercial, and industrial lands; roadways; and mining operations, which are generally devoid of native vegetation and provide little habitat value. However, a discussion of these lands and potential impacts on their uses is presented in section 4.8. Table 4.5.1-1 identifies the land cover types and representative species occurring in the Rover Project area by state.

These land cover types would be impacted by the construction right-of-way as well as additional temporary workspace and is present throughout Pennsylvania, West Virginia, Ohio, and Michigan. Upland forests in the Rover Project area are composed of a large variety of species including beech, cherry, maple, and oak species. The pipelines would cross large tracts of forested areas in West Virginia, Pennsylvania, and southeastern Ohio where forested tracts of 100 acres or more are prevalent, but as they continue west through Ohio and north through Michigan, agricultural and open land are predominant and large (100-acre) forested tracts become less common.

Agricultural lands include areas used for livestock grazing and crop production that provide minor to moderate wildlife habitat value. Commercial crops common in the counties crossed by the Rover Project in Ohio and Michigan include alfalfa, corn, soybeans, and winter wheat. Commercial crops grown within the Rover Project area in West Virginia and Pennsylvania include alfalfa, corn, hay, and soybeans.

TABLE 4.5.1-1

Land Cover Types and Representative Species occurring in the Rover Pipeline Project Area by State

Land Cover	Representative Species
West Virginia	
Upland Forests	American beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), slippery elm (*Ulmus rubra*), red maple (*Acer rubrum*), black walnut (*Juglans nigra*), white ash (*Fraxinus americana*)
Agricultural Lands - Active hayfields, cultivated land, specialty crops	Hay, alfalfa, corn, soybeans
Open Uplands	Kentucky bluegrass (*Poa pratensis*), meadow fescue (*Festuca pratensis*), reed canary grass (*Phalaris arundicra*), broomsedge bluestem (*Andropogon virginicus*)
Forested Wetlands	Sugar maple, white ash, American tulip tree (*Liriodendron tulipifera*), American elm (*Ulmus americana*), Northern spicebush (*Lindera benzoin*)
Emergent Wetlands	Shallow sedge (*Carex lurida*), Woolgrass (*Scirpus cyperinus*), Dark-green bulrush (*Scripus atrovirens*), Fowl mannagrass (*Glyceria striata*), Pennsylvania smartweed (*Persicaria pennsylvanica*), Broadleaf cattail (*Typha latifolia*), Lamp juncus (*Juncus effuses*), Yellow nutsedge (*Cyperus esculentus*), Bluejoint (*Calamagrostis canadensis*), Canadian clearweed (*Pilea pumila*), Fox sedge (*Carex vulpinoidea*)
Scrub-Shrub Wetlands	Buttonbush (*Cephalanthus occidnetalis*), black willow (*Salix nigra*), twinsisters (*Lonicera tatarica*), Amur honeysuckle (*Lonicera maackii*), sweet woodreed (*Cinna arundinacea*), rice cutgrass (*Leersia oryzoides*)
Pennsylvania	
Upland Forests	Black cherry (*Prunus serotina*), osage orange (*Maclura pomifera*), black walnut, American elm, twinsisters, multiflora rose (*Rosa multiflora*)
Agricultural Lands - Active hayfields, cultivated land, specialty crops	Alfalfa, soybeans, corn, hay
Open Uplands	Red fescue (*Festuca rubra*), orchardgrass (*Dactylis glomerata*), Canada goldenrod (*Solidago canadensis*), spreading dogbane (*Apocynum androsaemifolium*), white clover (*Trifolium repens*), Kentucky bluegrass
Forested Wetlands	American elm, shallow sedge (*Carex lurida*), sensitive fern (*Onoclea sensibilis*), giant goldenrod (*Solidago gigantea*), wingstem (*Verbesena altermiflora*), broadleaf cattail (*Typha latifolia*)
Emergent Wetlands	Fox sedge (*Carex lurida*), small white oldfield aster (*Symphyotrichum racemosum*), sweet flag (*Acorus calamus*), broadleaf cattail, harvestlice (*Agrimonia pariflora*), common boneset (*Eupatroium perfoliatum*), fowl mannagrass (*Glyceria striata*)
Scrub-Shrub Wetlands	Black willow, creeping Jenny (*Lysimachia nummularia*)
Ohio	
Upland Forest	American beech, black cherry, red maple, American tulip tree, white oak (*Quercus alba*), American elm, shagbark hickory (*Carya ovata*), American basswood (*Tilia americana*)
Agricultural Lands - Cultivated land, specialty crops	Soybeans, corn, winter wheat, alfalfa
Open Uplands	Meadow fescue, Kentucky bluegrass, Canada goldenrod, late goldenrod (*Solidago altissima*), white snakeroot (*Ageratina altissima*), American hophornbeam (*Ostrya virginiana*)
Forested Wetlands	Silver maple (*Acer saccharinum*), American elm, pin oak (*Quercus palustris*), red maple, swamp white oak (*Quercus bicolor*), green ash (*Fraxinus pennsylvanica*), black willow, cattail sedge (*Carex typhina*), reed canarygrass, arrow-leaf tearthumb (*Persicaria sagittata*)

TABLE 4.5.1-1 (continued) **Land Cover Types and Representative Species occurring in the Rover Pipeline Project Area by State**	
Land Cover	**Representative Species**
Emergent Wetlands	Reed canarygrass, woolgrass (*Scirpus cyperinus*), fox sedge (*Carex vulpinodea*), black bent (*Agrostis gigantea*), swamp smartweed (*Persicaria hydropiperiodes*), wingstem (*Verbesena alterniflora*), blunt spikerush (*Eleocharis obtusa*), fowl bluegrass (*Poa palustris*), lamp juncus (*Juncus effuses*)
Scrub-Shrub Wetlands	American elm, black willow, American elderberry (*Sambucus canadensis*), box elder (*Acer negundo*), stiff dogwood (*Cornus foemina*), watercress (*Nasurtium officinale*), common jewelweed (*Impatiens capensis*), harvestlice, dark-green bulrush (*Scirpus atrovirens*)
Michigan	
Upland Forest	Black cherry, sugar maple, white oak, shagbark hickory, chokeberry (*Prunus virginiana*), American beech, common buckthorn (*Rhamnus carthartica*), American basswood (*Tilia americana*)
Agricultural Lands - Cultivated land, specialty crops	Soybeans, corn, winter wheat, alfalfa
Open Uplands	Annual ragweed (*Ambrosia artemisiifolia*), Canada goldenrod, late goldenrod, smooth broome (*Bromus inermis*), beebalm (*Monarda fistulosa*), creeping thistle (*Carsium arvense*),
Forested Wetlands	American elm, green ash, swamp white oak, box elder, red maple, black willow, bitternut hickory (*Carya cordiformis*), silver maple, reed canarygrass
Emergent Wetlands	Reed canarygrass, broadleaf cattail, sensitive fern (*Onoclea sensibilis*), flat-top goldenrod (*Euthamia gramiminfolia*), late goldenrod, spotted trumpetweed (*Eutrochium maculatum*), hairy sedge (*Carex lacustris*)
Scrub-Shrub Wetlands	Black willow, sandbar willow (*Salix interior*), pussy willow (*Salix discolor*), eastern cottonwood (*Populus deltoids*), buttonbush, silky dogwood (*Cornus amomum*), stiff dogwood (*Cornus foemina*), red osier dogwood (*Cornus stolonifera*)

Open lands consist of non-forested vegetated areas not encompassed by developed or agricultural lands and include grass and shrub lands, successional fields, and maintained rights-of-way. Wetlands in the Rover Project area are described in section 4.4.

The Rover Project would affect 9,251.8 acres of vegetated land during construction and 3,375.4 acres of vegetated land during operation. Of the acres affected by construction, 3,000.6 acres are upland forested areas, 5,328.0 acres are agricultural lands, 763.1 acres are upland open lands, and 160.0 acres are wetlands. Appendix N presents a summary of the acreages by land cover impacted by construction and operation of the Rover Project. Impacts on wetlands are discussed in section 4.4.

Construction of the Panhandle Project would impact 50.6 acres of agricultural land and 40.6 acres of open land within existing facilities and pipeline rights-of way. Construction of the Trunkline Project would impact 21.6 acres of open land within existing facilities and pipeline rights-of way. Construction of Trunkline's interconnection to the Panhandle system would impact an additional 36.2 acres of open and industrial land; however, these impacts are within the construction footprint of Panhandle's Tuscola Compressor Station.

4.5.1.1 Pipeline Facilities and Additional Temporary Workspace

The majority of the vegetation that the Rover pipeline facilities (including additional temporary workspace) would impact during construction is agricultural land (5,122.7 acres). Additional vegetation types that would be impacted include upland forests (2,884.2 acres), open lands (320.4 acres), and wetlands (159.7 acres). Additional workspace would be used on a temporary basis to support construction activities and would typically range in dimension from 10 to 50 feet by 50 to 250 feet for road and smaller stream or wetland crossings. Larger areas would be needed for staging and fabrication of drag sections at foreign pipeline or other utility crossings, at pipe tie-ins, or at HDD entry and exit points.

4.5.1.2 Aboveground Facilities

Aboveground facilities for the Rover Project include mainline valves, pig launcher/receivers, compressor stations, receipt and delivery meters, and tie-in sites. Construction of aboveground facilities for the Rover Project would impact 111.6 acres of upland forest, 199.1 acres of agricultural land, 30.5 acres of open lands, and 0.3 acre of emergent wetlands. About 0.2 acre of wetland would be permanently affected as a result of operation of aboveground facilities.

Aboveground facilities for the Panhandle Project include modified compressor station piping, auxiliary facilities, and taps necessary to establish an interconnection with the Rover pipeline system. Construction of aboveground facilities for the Panhandle Project would impact 50.6 acres of agricultural lands, and 40.6 acres of open land within existing facilities and pipeline rights-of-way.

Aboveground facilities for the Trunkline Project include modified compressor station piping at the existing Panhandle-Trunkline Interconnect that is within the existing Panhandle Tuscola Compressor Station, and a modified meter station located within the interconnection at the Trunkline Mainline. Construction of aboveground facilities for the Trunkline Project would impact 21.6 acres of open land within existing facilities and pipeline rights-of-way, and an additional 36.2 acres of open and developed land within Panhandle's Tuscola Compressor Station.

4.5.1.3 Contractor Yards

Rover proposes to use 13 contractor yards on a temporary basis to support construction activities. These contractor yards would impact 402.9 acres of open uplands. Contractor yards would not be used during operation of the Rover Project, resulting in no permanent impacts.

4.5.1.4 Access Roads

Rover would use 172 temporary access roads during construction activities and an additional 53 permanent access roads during construction and operation. During construction, the access roads would impact 5.0 acres of upland forests, 9.0 acres of open lands, and 6.2 acres of agricultural land Impacts on vegetated lands as a result of operation of access roads include 1.6 acres of upland forests, 3.1 acres of agricultural land, and 5.7 acres of open lands. There would be no temporary or permanent impacts on wetlands associated with access roads.

4.5.2 Vegetation Communities of Special Concern or Value

Rover consulted with federal and state resource agencies to identify sensitive or protected vegetation types, natural areas, and unique plant communities in the Rover Project area. Information regarding federally or state-listed plant species (including species of special concern) is included in section 4.7. No vegetation communities of special concern have been identified within the Rover Project area.

4.5.3 Interior Forest Habitat

Interior forest habitat is not managed as a federal- or state-regulated sensitive area, but does provide habitat for a variety of wildlife species. We are defining interior forests as forested areas greater than 300 feet from the influence of forest edges or open habitat (Jones et al., 2001). These habitats provide protection from disturbance and predation, food resources, and brooding habitat for wildlife. Clearing or fragmentation of interior forests creates more edge habitat and smaller forested tracts, which can impact availability and quality of feeding and nesting habitat for certain species as well as isolate species populations (Rosenberg et al., 1999). Interior forest has a higher habitat value for some wildlife species and is generally considered more rare in the environment compared to edge forest which has a lower habitat value for many species and can be created immediately with disturbance (Landowner Resource Center, 2000; Sprague et al., 2006).

Rover would cross an estimated 79 miles of interior forest habitat, which includes upland and wetland vegetation communities. Construction activities for the pipeline would impact 1,315.7 acres of interior forest habitat with operation of the pipeline facilities permanently eliminating 585.6 acres of interior forest.

In order to minimize and reduce impacts on sensitive habitat, Rover has implemented a number of measures to reduce adverse effects of construction and operation of the Rover Project on forest species, including interior forest species:

- Project facilities have been routed to avoid sensitive environmental resources where feasible;
- about 24 percent of new pipeline would be either adjacent or parallel to existing rights-of-way;
- construction and operation rights-of-way widths and temporary land requirements for installation would be limited to the minimum necessary, e.g., 150 feet in agricultural land and 75 feet in forested wetlands;
- avoidance of forested areas, especially contiguous forested areas to the extent feasible;
- providing mitigation for impacts on sensitive environmental resources, including mitigation for impacts on migratory bird and listed species habitat;
- following the measures outlined in Rover's Plans and Procedures to minimize impacts during construction and operation of the Rover Project; and
- prohibiting right-of-way maintenance during the bird nesting season (April 15 through August 1).

In addition to direct impacts on interior forest tracts by the proposed clearing during construction and maintenance operations, indirect impacts also would occur on interior forest tracts. Newly created edge habitats would be established by maintenance of the permanent right-of-way and the indirect impacts could extend for 300 feet on each side (600 feet total) of the new corridor into remaining interior forest blocks. The actual indirect impacts could be less or more depending upon the size, shape, and post-construction status of the remaining, adjacent forested areas in relation to the permanent right-of-way. While the indirectly affected lands adjacent to the right-of-way would remain forested, they would have reduced habitat value for interior forest species compared to pre-construction conditions. The creation of edge habitat could increase the risk of establishment of invasive species and other impacts on wildlife species. In section 4.5.4, measures to control invasive species are discussed, and section 4.6.1.4 describes potential impacts of edge habitat on wildlife.

Although Rover has attempted to route its Project adjacent to existing disturbance and outside of forested areas, impacts on the upland forest habitat and migratory birds and other wildlife that use this habitat still account for 32 percent of the vegetation Project impacts, an impact that we have concluded is significant. Sections 4.6.1.5 and 4.7 describe Rover's potential impacts on migratory birds and their interior forest habitats in relation to the MBTA and BGEPA. In addition, the permanent clearing of a 30- to 50-foot-wide right-of-way may result in effectively disconnected forested tracts (Jones et al., 2001).

On July 6, 2015, Rover filed a Draft Migratory Bird Conservation Plan that details impacts on upland forest habitat (including Rover's valuation of these habitat impacts) and measures proposed to reduce impacts and offset temporary and permanent impacts through conservation. Estimated construction impacts include 3,000.6 acres of forested uplands habitat and 33.4 acres of forested wetland habitat.

To reduce impacts on forest habitat, Rover would implement its general avoidance and impact minimization measures, and upland forest conservation measures as described in its Draft Migratory Bird Conservation Plan. A final plan developed in coordination with the applicable agencies prior to construction would identify mitigation for forest habitat loss (see section 4.6.1.5).

4.5.4 Noxious Weeds and Other Invasive Plant Species

Invasive species are those that display rapid growth and spread, becoming established over large areas (USDA, 2013b). Most commonly, they are exotic species that have been introduced from another part of the United States, another region, or another continent, although some native species that exhibit rapid growth and spread may also be considered invasive. Invasive plant species can change or degrade natural vegetation communities, which can reduce the quality of habitat for wildlife and native plant species. Similar to invasive species, noxious weeds are frequently introduced into disturbed areas, but occasionally are native. Noxious weeds are defined as those that are injurious to commercial crops, livestock, or natural habitats, and typically grow aggressively in the absence of natural controls (USDA, 2013c).

Rover's removal of existing vegetation and disturbance of soils during construction of the proposed facilities could create conditions conducive to the establishment of invasive weeds, particularly where new corridors are established. About 58 percent of the land that would be disturbed by the Rover Project is agricultural land. Rover has outlined measures within its state-specific AIMPs and its Plan and Procedures to minimize the potential spread of invasive species. These measures are designed to control invasive plant species during Project construction and operation through routine monitoring, maintenance, and rapid restoration and reseeding following installation of the pipeline, which would promote the establishment of desirable plant species and deter the spread of unwanted plant species. Given the occurrence of invasive species identified during field surveys, Rover would employ site-specific procedures during the restoration phase of construction to prevent the spread of noxious weeds following installation of the pipeline as outlined in its Invasive Species Plan (see appendix G).

Examples of these measures are as follows:

- Rover would provide for weed control in agricultural lands in a manner that prevents the spread of weeds onto adjacent lands used for agricultural purposes. Spraying would be done by a pesticide applicator that is licensed by the state;
- Rover would conduct follow-up inspections of all disturbed areas to determine the success of revegetation. In non-agricultural areas, revegetation should be considered successful if the

cover and density of native (non-nuisance) vegetation is similar in density and cover to adjacent undisturbed lands;

- Rover would develop a Project-specific wetland restoration plan, which would include measures for re-establishing herbaceous and/or woody species, controlling the invasion and spread of invasive and noxious weeds, and monitoring the success of the revegetation of weed control effort;
- Rover would assure that in agricultural lands where imported soil materials are employed for backfill, the imported soil materials would be free from noxious weeds and other pests to the extent possible;
- Rover would control the spread of diseases such as oak wilt through adherence to federal- and state-specific regulations for preventing the spread of this disease by burning or chipping the wood resulting from all clearing activities; and
- Rover would continue to consult with federal and state agencies to determine if additional measures are required for invasive species control.

Measures in the plan focus on post-construction activities and restoration. However, the plan does not provide mitigation measures that would occur during construction of the Rover Project. Given the potential for construction activities to introduce or spread invasive species along the construction right-of-way, additional precautions should be taken during construction to alleviate these concerns and prevent the spread of invasive species. **Therefore, we recommend that:**

- **<u>Prior to construction</u>, Rover should revise the Invasive Species Plan, in consultation with the appropriate federal, state, and local agencies, to include mitigation measures that would be taken during construction to prevent the spread of invasive species. Mitigation may include, but is not limited to: training of workers in the recognition of invasive species and to be familiar with locations where invasive species were identified during surveys, cleaning of equipment prior to entering the right-of-way, or setting up wash stations to remove invasive species from vehicles, equipment, and materials in areas identified as having an invasive species present. Rover should file the revised plan with the Secretary, for review and written approval of the Director of OEP.**

4.5.5 General Impacts and Mitigation

Construction impacts on vegetation resources are classified based on the duration and significance of impacts. Temporary impacts generally occur during construction with vegetation returning to pre-construction conditions almost immediately after construction, whereas short-term impacts are those which require up to 3 years to return to pre-construction conditions. Long-term impacts require more than 3 years to revegetate but conditions would return to their pre-construction state during the life of the Rover Project. Permanent impacts are those that modify vegetation resources to the extent that they would not return to pre-construction conditions during the life of the Rover Project. Impacts on wetland vegetation were discussed in section 4.4. Construction and restoration would be conducted in accordance with Rover’s CMPs.

4.5.5.1 Pipeline Facilities and Additional Temporary Workspace

The Rover Project pipelines (Supply Laterals, Mainlines A and B, and Market Segment) would be constructed parallel and adjacent to existing pipelines or utility lines to the greatest extent practical. The primary impact of pipeline construction and additional temporary workspace would be the cutting, clearing, and/or removal of 8,487.1 acres of existing vegetation of which 2,884.2 acres is upland forest. The remaining vegetation would include 5,122.7 acres of agricultural land, 320.4 acres of open land, and 159.7 acres of wetlands (including 33.4 acres of forested wetlands). Specific mitigation for impacts on wetlands is discussed in section 4.4.

Impacts associated with disturbances to vegetation could include increased soil compaction and erosion, increased potential for the introduction and establishment of non-native and invasive species, and a local reduction in available wildlife habitat. Rover would implement erosion control measures, monitoring, and maintenance measures as described in its Plan and Procedures and mitigate the introduction of non-native and invasive species in agricultural lands by adhering to the AIMP developed for Ohio and Michigan.

During clearing activities for construction, Rover would mow non-woody vegetation to ground level, and cut and remove woody vegetation and stumps, as necessary. Rover would fell trees and other woody material into the right-of-way. Wood would be burned, chipped, or Rover would stack the tree-length cut timber on the landowner property for landowner use if the landowner requests. If the landowner does not want the wood, the debris would be removed. Following construction, Rover would seed all of the previously vegetated workspaces disturbed by construction in accordance with its Plans and Procedures. Use of these seed mixes would be approved by the applicable regulatory agencies prior to use.

Most impacts on agricultural lands would be temporary to short-term, as these areas are disturbed annually to produce crops and would typically return to their previous condition shortly following construction, cleanup, and restoration. Rover would maintain topsoil segregation throughout all construction activities in agricultural lands in order to mitigate impacts on subsequent crop production and maintain a minimum cover depth of 48 inches. Lands currently dominated by herbaceous growth would revegetate quickly, often within one growing season after seeding, and otherwise typically within 3 years, depending on a number of factors. Cleared scrub-shrub vegetation would likely require 3 to 5 years to re-establish its woody composition.

Following construction, if Rover’s operational site monitoring or FERC inspections identify unsuccessful revegetation or potential invasive species colonization, Rover would be required to conduct additional vegetation management, such as herbicide application.

During operations, Rover would mow up to a 50-foot-wide permanent right-of-way for single pipelines and a 60-foot-wide permanent right-of-way for dual pipelines in upland areas every 3 years. Within wetlands and within a 25-foot strip adjacent to wetlands, Rover would permanently maintain only a 10- and 30-foot-wide swath centered on the single pipeline and dual pipeline, respectively. Selective removal of trees greater than 15 feet in height and within 15 feet of the pipeline would be conducted.

During operation, 3,258.1 acres of vegetated land would be within the permanent right-of-way, of which 1,140.3 acres are upland forest and 70.9 acres are wetlands. About 20.3 acres of forested wetlands would be permanently converted to an herbaceous state. Where feasible, Rover has routed the pipeline to reduce impacts on vegetation from clearing. Rover would further reduce impacts on vegetation by adherence to its Plan and Procedures and state-specific AIMPs. Specific measures that would reduce the impacts include:

- minimizing the footprint of the proposed work activities and the duration of disturbances to the extent practicable;
- minimizing disturbances to wetlands;

- protecting topsoil and mitigation of subsoil compaction within agricultural and residential areas, which could impact root systems of existing vegetation;
- routing adjacent or parallel to existing rights-of-way to the extent practicable;
- installing erosion controls to prevent the loss of soils, and reseeding in all disturbed areas that are not actively be used for cultivated crops, to stabilize the soils and speed revegetation; and
- monitoring the success of revegetation efforts and taking appropriate action to correct any poor revegetation that is observed.

Because the clearing associated with forested lands (both upland and wetland) would be long-term in the construction workspace and permanent in the areas maintained during operations, clearing would result in significant changes to the vegetative composition of the Rover Project area.

4.5.5.2 Aboveground Facilities

The acreages of vegetation impacted during construction and operation of Rover's 10 compressor stations, 21 meter stations, 6 tie-ins, 77 mainline valves, and pig launcher and receiver facilities on vegetation type are provided in appendix N. These facilities would be located on lands to be purchased or leased by Rover, which are generally adjacent to the pipelines. The Rover Project would disturb a total of 111.7 acres of upland forest, 199.1 acres of agricultural lands, 30.5 acres of open land, and 0.3 acre of emergent wetlands for construction of the new aboveground facilities. Temporary impacts on vegetation within the construction work area would be similar to those described for the pipeline facilities. Rover would stabilize, seed, and allow the temporary workspace areas used during construction to revegetate.

Permanent vegetation impacts would include the conversion of a total of 20.7 acres of upland forest, 8.9 acres of open land, 77.4 acres of agricultural land, and 0.2 acre of emergent wetlands to developed land. Rover would locate mainline valves and pig launcher and receiver facilities within the permanent easement for the pipeline or at the compressor station, meter station, or tie-in sites to avoid additional impacts on vegetation.

Construction of the Panhandle Project would impact 40.6 acres of open land within existing facilities and pipeline rights-of way, and 50.6 acres of agricultural lands. Construction of the Trunkline Project would impact 168.1 acres of open and developed lands within existing facilities and pipeline rights-of way.

4.5.5.3 Contractor Yards

A total of 13 contractor yards would impact 402.9 acres of open land during construction activities. Following construction, Rover would reseed the open land and allow it to revegetate.

4.5.5.4 Access Roads

The proposed access roads for the pipeline would impact 5.0 acres of upland forest, 6.2 acres of agricultural lands, and 9.0 acres of open lands during construction. Construction impacts on vegetation would be comparable to those described for the proposed pipeline, including the potential for soil compaction and erosion, and establishment of invasive species. Following construction, Rover would restore and seed any previously vegetated areas affected by construction of the temporary access roads according to its Plan and Procedures. During operations, the 46 permanent access roads would permanently convert 10.4 acres of vegetated land to developed lands. The location, description, length, land use, and type of improvement required (if any) for each of the access roads are listed in appendix F.

Based on our review of the potential impacts on vegetation as described above, we conclude that the primary impact from construction and operation would be on agricultural and forested lands. Due to the habitat value that forested lands provide and the long-term to permanent impacts on forest habitat, we have concluded that the Projects' impacts on forested lands would be significant. Impacts on forested and non-forested vegetation types would be mitigated, to the extent possible, through adherence to the measures described in Rover's CMPs and our additional recommendations throughout this EIS. We do not consider the Projects' impacts on agricultural lands to be significant due to the expected return of agricultural lands to productivity after construction, as well as our recommendations throughout this EIS and Rover's implementation of its AIMPs.

4.6 WILDLIFE AND AQUATIC RESOURCES

4.6.1 Wildlife

4.6.1.1 Existing Wildlife Resources

The Projects would traverse terrestrial and wetland habitats that support a diversity of wildlife species. Wildlife habitats in the Project areas are representative of the local vegetation communities (upland forest, open land, agricultural land, developed land, and wetlands).

Upland forest is characterized by hardwood forests which provide food resources, nesting habitat, and cover for a variety of reptiles, amphibians, mammals, birds, and invertebrates. Open land is characterized by grasslands, fields, and scrub-shrub areas which provide cover as well as foraging and nesting habitat for a variety of species. Agricultural land, though limited in cover, provides forage and nesting habitat for a variety of songbirds. Developed land includes residential, commercial, and industrial land, roadways, and mining operations; is generally devoid of native vegetation; and often provides little wildlife habitat. Forested, scrub-shrub, and emergent wetlands provide cover, forage, and nesting habitat for a variety of reptiles, amphibians, mammals, and birds. The vegetation composition of each community is described in section 4.5. Representative wildlife species that could be found in the Rover Project area include the white-tailed deer, red fox, eastern cottontail, raccoon, common garter snake, green frog, northern mockingbird, wood duck, and American robin.

Project Facilities

Construction of the Rover Project would impact a total of 3,000.6 acres of upland forest, 5,328.0 acres of agricultural land, 763.1 acres of open upland, 160.0 acres of wetlands (of which 33.4 acres is forested wetland), 17.5 acres of waterbodies, and 293.3 acres of developed land. Construction of the Panhandle Project would impact 40.6 acres of open land, 138.3 acres of developed land, and 50.6 acres of agricultural land within existing facilities on land parcels owned or leased by the applicant. Construction of the Trunkline Project would impact 146.5 acres of developed land and 21.6 acres of open land within existing facilities on land owned or leased by the applicant. An additional 36.2 acres would be impacted for the construction of the Panhandle-Trunkline Interconnect, all of which would be within Panhandle's Tuscola Compressor Station.

Impacts of individual Project components (the pipelines, aboveground facilities, contractor yards, and access roads) upon vegetation types are provided in section 4.5.

4.6.1.2 Sensitive or Managed Wildlife Habitats

Sensitive wildlife habitats associated with wildlife management areas and federally listed, state-listed, and special-status species such as migratory birds would be crossed by the Projects (see section 4.7). Several other managed wildlife habitats in proximity to the Rover Project would not be directly affected by construction or operation (see section 4.8).

Rover consulted with the following agencies and offices to identify significant sensitive wildlife habitats or managed wildlife habitats in the vicinity of the Rover Project:

- FWS offices in the Rover Project area including the Midwest Regional Office; and the West Virginia, Pennsylvania, Ohio, and Michigan Field Offices;
- U.S. Department of Interior, Office of Environmental Policy and Compliance (OEPC);
- Wayne National Forest;
- West Virginia Department of Natural Resources (WVDNR);
- Pennsylvania Department of Conservation and Natural Resources (PADCNR);
- Pennsylvania Game Commission (PAGC);
- Pennsylvania Fish and Boat Commission (PAFBC);
- OHDNR;
- Michigan Department of Natural Resources (MIDNR); and
- Michigan Natural Features Inventory (MINFI).

The areas identified by these agencies and the details of the effects of the Rover Project on these areas are provided in table 4.6.1-1 and discussed below. Specific information regarding threatened and endangered wildlife species and their habitats is included in section 4.7.

No sensitive wildlife habitats, managed wildlife habitats, or Important Bird Areas (IBAs) would be crossed by the Rover Project in West Virginia or Pennsylvania. The Rover Project would cross four Audubon IBAs in Ohio and one in Michigan. IBAs are discrete locations of varying size that are designated by the Audubon Society as being vital to birds in a region. IBAs are noted as priority areas in the 2011 Memorandum of Understanding between the FWS and the FERC regarding the conservation of migratory birds under the MBTA; see section 4.5.3 for further information regarding migratory birds.

The Panhandle and Trunkline Projects would be constructed and operated on developed lands within existing facilities on land owned or leased by the applicant. Therefore, sensitive or managed wildlife habitats would not be affected by these Projects.

TABLE 4.6.1-1

Managed Wildlife Habitats Crossed by the Rover Pipeline Project

Start MP	End MP	Sensitive Habitat Name	Administering Agency	Length Crossed (miles)	Existing Habitat Type	Acreage Affected	
						Construction	Operation
Ohio							
SWL 35.8	SWL 46.2	Wayne National Forest – Marietta IBA	National Audubon Society	10.4	Forest, Open Land, Agriculture	182.5	63.2
BNL 0.0	BNL 1.8	Wayne National Forest – Marietta IBA	National Audubon Society	1.8	Forest, Open Land, Agriculture	32.6	20.0
MAB 67.5	MAB 68.6	Killbuck Valley IBA	National Audubon Society	1.1	Open Land, Forest	17.6	8.0
MAB 77.4	MAB 79.3	Funk Bottoms IBA	National Audubon Society	1.9	Open Land, Agriculture	53.1	35.7
MAB 84.0	MAB 84.8	Funk Bottoms IBA	National Audubon Society	0.8	Forest Wetland	12.6	5.8
MAB 138.8	MAB 142.9	Sandusky River IBA	National Audubon Society	4.1	Agriculture	69.0	29.8
Michigan							
MS 82.5	MS 83.8	Pinckney Recreation Area	MIDNR	1.3	Forest, Agriculture, Open Land	21.2	7.9
					Total	**388.6**	**170.4**

IBA = Important Bird Area

Michigan

Rover's Market Segment pipeline route would cross the Pinckney Recreation Area for about 1.5 miles from MPs MS 82.5 to MS 84.0 in Washtenaw County, Michigan. The 11,000-acre Pinckney Recreation Area is managed by the MIDNR for conservation of ecological, cultural, and historic values, and public use including recreation. The Pinckney Recreation Area includes forest, agriculture, and open land habitats. About 22.7 acres would be impacted by construction of the Rover Project, and 8.9 acres would be affected by Project operations. For additional discussion of the Pinckney Recreation Area, see section 4.8.5.

Ohio

The Wayne National Forest-Marietta Unit would be crossed by the Sherwood Lateral (MPs SWL 35.8 to SWL 46.2) and Berne Lateral (MPs BNL 0.0 to BP BNL 1.8) in Monroe and Noble counties, Ohio, respectively. The Wayne National Forest is comprised of three noncontiguous units located in the foothills of the Appalachian Mountains. Deciduous hardwood forest is the dominant habitat, with a variety of other interspersed habitats including wetlands, grasslands, and scrub-shrub fields.

Mainlines A and B would cross the Killbuck Valley, Funk Bottoms, and Sandusky River IBAs. The Killbuck Valley IBA is dominated by riparian and marshland habitats and would be crossed in Wayne County, Ohio. The Funk Bottoms IBA is dominated by floodplain bottoms and wetlands with surrounding agriculture fields and would be crossed in Wayne and Ashland Counties, Ohio. The Mainline Compressor Station 2 site is within the peripheral boundary of the Funk Bottoms IBA. The Sandusky River IBA is also dominated by riparian habitats with adjacent agriculture fields. Mainlines A and B would cross the Sandusky IBA within Seneca County, Ohio, with the Sandusky River being crossed via HDD.

4.6.1.3 General Impacts and Mitigation

Pipeline Facilities

For the Rover Project, construction of the pipeline and extra workspace would impact a total of 8,487.0 acres of vegetated habitat. Rover would implement its Plan and Procedures to minimize temporary and permanent effects on wildlife and to promote stabilization and revegetation of disturbed areas. During operations, 3,258.1 acres of vegetated habitat within the permanent right-of-way would convert to an early successional stage, which Rover would maintain by mowing. This maintenance would result in the conversion of 1,140.3 acres of upland forest and 20.3 acres of forested wetlands to herbaceous and scrub-shrub habitat.

Wildlife could be impacted by clearing of vegetation; alteration of the landscape from grading the ground, soil disturbance, and recontouring; conflicts with vehicles; human presence; activities associated with trenching; increased predation; and edge effects and habitat fragmentation. During construction, more mobile species would be temporarily displaced from the construction right-of-way to similar habitats nearby due to human presence and noise increases. Noise impacts would typically be temporary and intermittent, as pipeline construction typically occurs in a manner similar to a moving assembly line. Less mobile species, such as small mammals, reptiles, amphibians, and nesting birds, may experience direct mortality or permanent displacement. Displacement of species could lead to increased competition for some resources. Some wildlife displaced from the right-of-way would return to the newly disturbed area and adjacent, undisturbed habitats after completion of construction. Soil-dwelling invertebrates would be impacted directly through movement of soil from one place to another, resulting in some mortality and displacement. This could reduce the forage potential for insectivores and other small predators that inhabit the area. The overall impact of these effects; however, would be minor due to the temporary nature of the effects and limited area affected by construction.

The clearing of vegetation on the construction right-of-way and extra workspaces would reduce cover, foraging, breeding, and nesting habitat for some wildlife. The degree of impact would depend on the type of habitat affected, the timing of clearing and construction activities, and the rate at which the area recovers after disturbance from construction. The effect on species that rely on open land habitats would be short-term, as they would likely recover through natural succession within 1 to 3 years after construction. Cleared scrub-shrub vegetation would likely require several years to regain its woody composition. The effect of workspace clearing on forest-dwelling wildlife species would be greater than open land and scrub-shrub habitat wildlife as forested lands could take decades to return to pre-construction condition, and Rover would prevent trees from reestablishing on the permanent right-of-way. In upland areas, maintenance would involve mowing either the 50-foot-wide (for a single pipeline) or 60-foot-wide (for dual pipelines) permanent right-of-way every 3 years to remove woody vegetation, except in wetlands and in riparian areas. Vegetation management within wetland and riparian areas would be within a 10-foot-wide area centered on the pipeline. In wetlands, trees greater than 15 feet in height and within 15 feet of the pipeline could be cut and removed from the permanent right-of-way during maintenance activities to prevent establishment of roots that could compromise the integrity of the pipeline coating.

Trash and debris could impact wildlife by animals eating contaminated or dangerous items and by encouraging certain species to move into areas where humans are working, resulting in potential wildlife-human interaction and conflict. In section 4.7.3, we have recommended that Rover update its plans to include requirements for handling worksite trash and debris in order to minimize the potential for wildlife attraction.

A spill of hazardous materials during construction, such as diesel fuel or oil, or the excavation and exposure of contaminated soil or groundwater could impact wildlife. The potential impact would depend on the type and quantity of the spill, and the dispersal and attenuation characteristics of surrounding environment. To reduce the potential of impacts of accidental spills and leaks, Rover would implement its Spill Procedures, which include BMPs to minimize the potential for accidental releases and measures that would be implemented to clean up any releases. Additional measures in its BMPs include conducting routine inspections of construction equipment, tanks, and storage areas to help reduce the potential for spills or leaks, and restricting refueling and the handling of hazardous materials; compliance with the Spill Procedures would minimize impacts from chemicals or contaminants. Thus, we conclude that the risk of chemical exposure to individual animals would be low and there would be no risk of population-level impacts on wildlife species.

Construction traffic on paved and unpaved roads could temporarily disturb birds and other wildlife near the roadways. There could also be an increase in direct mortality of certain wildlife resulting from animal/vehicle collisions. However, due to the use of existing roads when practical, and the short timeframe of construction, we expect the overall impacts on wildlife from increased vehicular traffic to be minor.

Trenching activities and the spoil piles generated during construction could create potential traps where wildlife could fall into trenches. In addition, spoil piles could create barriers to some less mobile species such as small reptiles and amphibians. As required by Rover's Plan, construction would be sequenced to limit the amount and duration of open trench and associated spoil piles. Additionally, the EIs would inspect areas of active construction on a daily basis and would return any wildlife found to the appropriate suitable habitat. Therefore, we conclude that trenching and spoil pile impacts on wildlife movement and potential wildlife entrapment would be minimized to the extent practicable.

Increased predation could occur during construction and operation of the pipeline due to the removal of vegetation and the resulting increase in visibility. While individual mortality rates could increase, the Rover Project would not likely have any population-level impact from these effects.

Impacts due to fragmentation of contiguous forested tracts are dependent on the size and orientation of remaining tracts. Large forested tracts in close proximity and connected by corridors can provide high quality wildlife habitat; however, the creation of additional edge habitat has the potential to cause changes in vegetation composition, species distributions, and available foraging and nesting habitat (Rosenberg et al., 1999). In addition to impacts on migratory birds as discussed in section 4.6.1.3, the fragmentation of contiguous forested tracts can impact mammals, reptiles, and amphibians through loss of habitat, increased predation, and disruption of breeding. Forest habitat (and interior forest habitat in particular) can take decades to become established compared to forest edges and scrub or herbaceous habitats that can be established much more rapidly and which are relatively common in the Rover Project area. However, the creation of additional edge habitat could benefit certain foraging mammal species, by providing travel corridors and additional forage habitat.

Blasting is not proposed along the pipeline route; however, in the event that blasting is required, Rover has developed a blasting plan which would limit potential impacts on wildlife. Potential impacts from blasting are discussed in section 4.1.

Riparian zones are adjacent to waterbodies and contain vegetation dependent on moist soils. These habitats are important for water quality and bank stabilization and provide shelter, foraging areas, and nesting habitat for species of birds, mammals, reptiles, amphibians, and invertebrates. Potential impacts on wildlife from the removal of riparian vegetation include loss of habitat, reduced habitat quality, increased predation, temporary displacement of individuals, and alteration of migration and breeding habits. Rover would allow riparian areas at least 25 feet wide to permanently revegetate across the pipeline right-of-way at each waterbody crossing (except for a 10-foot-wide corridor centered over a single pipeline or a 30-foot-wide corridor centered over a dual pipeline) to facilitate bank stabilization, stream shading, and to provide wildlife habitat.

Rover has routed the pipeline to minimize impacts on sensitive wildlife habitat where feasible. Rover would further minimize impacts on wildlife habitat by adhering to its Plan and Procedures. Rover has committed to mitigate for forest habitat impacts in coordination with the FWS (see section 4.6.1.5).

For the Rover Project, construction of aboveground facilities would impact a total of 111.7 acres of upland forest, 199.1 acres of agricultural land, 30.5 acres of open upland, and 0.3 acres of emergent wetlands. Temporary impacts on wildlife occurring within or near construction workspaces would be similar to those described above for the pipeline facilities. Following construction, Rover would stabilize and allow temporary workspace to revegetate, which would restore their use to most wildlife. Construction of aboveground facilities would permanently convert a total of 20.7 acres of upland forest vegetation to developed land. Wildlife would likely be permanently displaced from these areas by habitat conversion to impervious cover or maintained vegetation and the erection of security fences at the aboveground facility sites.

For the Panhandle Project, modifications and upgrades would impact 50.6 acres of agricultural lands, 40.6 acres of open land, and 138.3 acres of developed land at existing facilities and pipeline rights-of-way. For the Trunkline Project, modifications and upgrades would impact 21.6 acres of open land and 146.5 acres of developed lands at existing aboveground facilities and pipeline rights-of-way. Due to the effects of the current land uses in these areas, impacts on wildlife resulting from the Projects would be minor. The increase in ambient noise in the immediate vicinity of these facilities during both construction and operation, could also result in a decrease in wildlife use of adjacent habitat. Changes in ambient noise levels are further discussed in section 4.11.2 along with proposed measures to limit noise exposure during both construction and operation of the Rover Project.

Contractor Yards

The proposed contractor yards would temporarily impact 402.9 acres of open land and 187.7 acres of developed land. Following construction, Rover would restore any previously vegetated areas that were affected. Use of these areas would temporarily displace wildlife species; however, displaced wildlife would return to these areas following restoration. Therefore, no permanent impacts on wildlife would result from the use of the contractor yards. No contractor yards would be required for the Panhandle and Trunkline Projects; instead, these applicants would use the existing compressor station sites for equipment and materials storage during construction.

Access Roads

Rover proposes to use 172 temporary access roads during construction and 53 permanent access roads during construction and operation of its Project. Of the permanent access roads, 11 are existing roads, 12 are existing roads that would either be expanded or widened, and 30 would be newly constructed roads. Construction of the temporary and permanent access roads would impact 5.0 acres of upland forest, 6.2 acres of agricultural land, 9.0 acres of open land, and 105.5 acres of developed land. Construction of access roads would impact less than 0.1 acre of wetland. Construction impacts on these habitats would be comparable to those described for pipeline facilities and include soil compaction and erosion, the potential establishment of invasive species, and fragmentation of interior forested tracts. Rover would restore any previously vegetated areas affected by construction according to its Plan and Procedures after construction is completed. Operational use of the 53 permanent roads would result in the permanent impact of 27.4 acres, including the conversion of 1.6 acres of upland forest, 3.1 acres of agricultural, and 5.7 acres of open land to developed land. A full list of access roads and discussion of their impacts is provided in appendix F. The Panhandle and Trunkline Projects would utilize existing public roads for access.

4.6.1.4 Conclusion

The overall impact of the Rover Project on most wildlife resources would be minor due to the temporary nature of the effects, the amount of similar adjacent habitat available for use, and implementation of Rover's Plan and Procedures. Forested species may be subject to greater impacts than non-forested species, but we recognize that these will be less than significant impacts given the availability of undisturbed forested habitat adjacent to Project workspaces and the ability for individual mobile species to seek refuge in these undisturbed areas.

The Panhandle Project would be constructed and operated on agricultural lands and on developed lands within existing facilities on parcels owned or leased by the respective applicant. Similarly, the Trunkline Project would be constructed and operated on developed lands within existing facilities on parcels owned or leased by the respective applicant. Therefore, overall impacts on wildlife from these Projects would be minor and temporary.

4.6.1.5 Migratory Birds

Migratory birds are species that nest in the United States and Canada during the summer and then migrate south to the tropical regions of Mexico, Central and South America, and the Caribbean for the non-breeding season. Migratory birds are protected under the MBTA (16 USC 703-711). Executive Order 13186 (EO 13186) (66 Federal Register 3853) directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations, to avoid or minimize adverse impacts on migratory birds through enhanced collaboration with the FWS, and to restore and enhance the habitat of migratory birds, as practicable. EO 13186 states that emphasis should be placed on species of concern, priority habitats, and key risk factors, and that particular focus should be given to addressing population-level impacts. Additionally, bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 USC 668-668d).

In response to a 1998 amendment to the Fish and Wildlife Conservation Act, the FWS established a list of Birds of Conservation Concern (BCCs) that, without conservation action, were expected to become candidate species for listing under the ESA (FWS, 2008). The BCC lists species of concern at National, FWS Region, and Bird Conservation Region (BCR) geographic scales. The Rover Project would cross four BCRs: Lower Great Lakes/St. Lawrence Plain U.S. portion only; Eastern Tallgrass Prairie; Prairie Hardwood Transition; and Appalachian Mountains. Table 4.6.1-2 lists BCCs for which the preferred habitat is known or expected to occur within the Rover Project area and whether or not breeding has been documented in the vicinity of the Rover Project.

TABLE 4.6.1-2

Birds of Conservation Concern Potentially Occurring in the Rover Pipeline Project Area

Common Name	Scientific Name	Habitat a	Potential Breeding in Project Vicinity b			
			PA c	WV d	OH e	MI f
Acadian Flycatcher	*Empidonax virescens*	Deciduous forests along streams and swamps.	No	No	No	No
American Bittern	*Botaurus lentiginosus*	Interior freshwater wetlands and occasionally coastal salt marshes. Breed/nest from May to July.	N/A	N/A	No	Pr
Bald Eagle	*Haliaeetus leucocephalus*	Undisturbed areas near large lakes and reservoirs, marshes and swamps, or stretches along rivers. Breeds in forested areas near large bodies of water. Breed/Nest from October 1 to May 15.	N/A	N/A	Co	Pr
Bell's Vireo	*Vireo bellii*	Dense, low, shrubby vegetation, generally early successional stages in riparian areas, brushy fields, young second-growth forest, or woodland.	No	No	No	No
Bewick's Wren	*Thryomanes bewickii*	Brushy areas, scrub and thickets, open woodlands.	No	No	No	No
Black Rail	*Laterallus jamaicensis*	Shallow salt and freshwater marshes and wet meadows.	No	No	No	No
Black Tern	*Chlidonias niger*	Found in freshwater marshes. Nests among marshes, along sloughs, rivers, lakeshores, and impoundments, or in wet meadows, typically in sites with mixture of emergent vegetation and open water. Breed/nest from May to July.	N/A	N/A	No	Po

TABLE 4.6.1-2 (continued)

Birds of Conservation Concern Potentially Occurring in the Rover Pipeline Project Area

Common Name	Scientific Name	Habitat a	Potential Breeding in Project Vicinity b			
			PA c	WV d	OH e	MI f
Black-billed Cuckoo	*Coccyzus erythropthalmus*	Edges and clearings of young deciduous and mixed deciduous-coniferous woods. Nests in groves of trees, forest edges, moist thickets, overgrown pastures, deciduous or evergreen tree, or shrub. Low or ground nesting species. Breed/nest from May to July.	N/A	N/A	Co	Pr
Black-capped Chickadee	*Poecile atricapillus*	Deciduous and mixed forests, open woods, parks, willow thickets, cottonwood groves, and disturbed areas.	No	No	No	No
Black-crowned Night Heron	*Nycticorax*	Wetlands including salt and freshwater marshes, swamps, streams, rivers, lakes, ponds, lagoons, tidal mudflats, canals, reservoirs, and agricultural fields.	No	No	No	No
Blue-winged Warbler	*Vermivora pinus*	Dense herbaceous growth and shrubs, scattered low trees, and wooded edges. Breed/nest from April to July.	Co	Pr	Co	Co
Bobolink	*Dolichonyx oryzivorus*	Mixed vegetation fields such as tallgrass and mixed prairie, hayfields, and meadows. Breeding occurs in freshwater marshes and coastal areas.	No	No	No	No
Brown thrasher	*Toxostoma rufum*	Thickets, hedgerows, forest edges, overgrown clearings, and deciduous forests.	No	No	No	No
Canada Warbler	*Wilsonia canadensis*	Primarily coniferous and mixed northern hardwood forests with dense, often wet, undergrowth. Breed/nest from May to June.	N/A	N/A	Po	No
Cerulean Warbler	*Dendroica cerulea*	Large forest tracts of tall, deciduous, broad-leafed tree species. Breed/nest from April to July.	Pr	Pr	Pr	Pr

TABLE 4.6.1-2 (continued)

Birds of Conservation Concern Potentially Occurring in the Rover Pipeline Project Area

Common Name	Scientific Name	Habitat a	Potential Breeding in Project Vicinity b			
			PA c	WV d	OH e	MI f
Common tern	*Sterna hirundo*	Rivers, lakes, and ocean coastlines.	No	No	No	No
Dickcissel	*Spiza americana*	Tall grasslands, including prairie, hayfields, lightly grazed pastures, and roadsides. Breed/nest from late May to July.	N/A	N/A	Po	Po
Field sparrow	*Spizella pusilla*	Abandoned agricultural fields and pastures, fencerows, road and forest edges, openings in wooded areas.	No	No	No	No
Golden-winged Warbler	*Vermivora chrysoptera*	Early successional fields with a combination of shrubby and open areas within the territory.	No	No	No	No
Grasshopper sparrow	*Ammodramus savannarum*	Open grasslands and prairies with patches of bare ground.	No	No	No	No
Henslow's sparrow	*Ammodramus henslowii*	Large, flat fields with tall, dense grass, a dense litter layer, and standing dead vegetation. Breed/nest from May to August.	Pr	No	Co	Co
Kentucky warbler	*Geothlypis formosa*	Ground nest in moist, deciduous woodland thickets, sometimes along streams. Breed/nest from May to July.	Pr	Pr	Co	No
Least Bittern	*Ixobrychus exilis*	Freshwater and brackish marshes with tall, dense emergent vegetation. Reed nesters. Breed/nest from April to August.	N/A	N/A	No	Po
Loggerhead Shrike	*Lanius ludovicianus*	Agricultural areas that contain hedgerows, hayfields, pastures and scattered trees and shrubs, especially hawthorn.	No	No	No	No
Louisiana Waterthrush	*Seiurus motacilla*	Breeds along gravel streams within deciduous forest.	No	No	No	No
Marsh wren	*Cistothorus palustris*	Marshes, especially with dense cattail or reeds.	No	No	No	No

TABLE 4.6.1-2 (continued)

Birds of Conservation Concern Potentially Occurring in the Rover Pipeline Project Area

Common Name	Scientific Name	Habitat a	Potential Breeding in Project Vicinity b			
			PA c	WV d	OH e	MI f
Northern flicker	*Colaptes auratus*	Woodlands, forest edges, open fields with scattered trees, as well as city parks and suburbs.	No	No	No	No
Northern saw-whet owl	*Aegolius acadicus*	Mature forest with open understory.	No	No	No	No
Olive-sided flycatcher	*Contopus cooperi*	Montane and coniferous forests and at forest edges, such as meadows and ponds.	No	No	No	No
Peregrine Falcon	*Falco peregrinus*	Most commonly occupied habitats contain cliffs for nesting and open areas for foraging. Ideal locations for nesting include undisturbed areas with a wide view, near water, and close to plentiful prey. Breed/nest from March to May.	N/A	N/A	Po	Po
Pied-billed Grebe	*Podilymbus podiceps*	Freshwater to brackish seasonal and permanent ponds. Nests are typically built in shallow water surrounded by dense vegetation. Breed/nest from April to August.	Co	No	Po	Co
Prairie Warbler	*Dendroica discolor*	Shrubby habitats including those in southern pine forest, mangroves, pine and scrub oak barrens, and regenerating forest. Breed/nest from April to August.	Pr	Pr	Co	Pr
Prothonotary warbler	*Protonotaria citrea*	Wooded swamps and other bottomland forests.	No	No	No	No
Red crossbill	*Loxia curvirostra*	Mature coniferous forests.	No	No	No	No
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Dead trees for nest sites, snags for roosting, and open ground for foraging. Breed/nest from February to September.	Po	No	Co	Co
Swainson's warbler	*Limnothlypis swainsonii*	Forests with thick undergrowth.	No	No	No	No

TABLE 4.6.1-2 (continued)

Birds of Conservation Concern Potentially Occurring in the Rover Pipeline Project Area

Common Name	Scientific Name	Habitat a	Potential Breeding in Project Vicinity b			
			PA c	WV d	OH e	MI f
Upland sandpiper	*Bartramia longicauda*	Native prairie and other dry grasslands, including airports and some croplands. Breed/nest from mid-April to late July.	N/A	N/A	Pr	No
Whip-poor-Will	*Caprimulgus vociferous*	Inhabit dry, semi-shaded forests with moderate to scant understories and nearby openings. Such woodlands may be deciduous or coniferous. Forest edges seem to be particularly suitable. Breed/nest from May to June.	Pr	No	No	Pr
Willow flycatcher	*Empidonax traillii*	Moist shrubby areas often with standing or running water.	No	No	No	No
Wood Thrush	*Hylocichla mustelina*	Interior and edges of mature deciduous or mixed forests. Breed/nest from April to August.	Co	Co	Co	Pr
Worm-eating Warbler	*Helmitheros vermivorum*	Mature deciduous or mixed forests on steep hillsides or ravines with a dense, shrubby understory. Breed/nest from May to July.	No	Pr	Pr	Pr
Yellow rail	*Coturnicops noveboracensis*	Shallow marshes and wet meadows.	No	No	No	No
Yellow-bellied sapsucker	*Sphyrapicus varius*	Young forests and edge habitat.	No	No	No	No

a Source: Cornell Lab of Ornithology, 2015.
b Co = Confirmed; Po = Possible; Pr = Probable; N/A = Species is not known within the area; No = Species does not breed in the area.
c Source: Pennsylvania State University, 2015.
d Source: West Virginia Breeding Bird Atlas II 2009-2014, 2015.
e Source: Ohio Breeding Bird Atlas II 2006-2011, 2015b; Ohio Breeding Bird Atlas II, 2015a.
f Source: Michigan Breeding Bird Atlas II 2002-2008, 2015.

On March 30, 2011, the FWS and the Commission entered into a *Memorandum of Understanding Between the Federal Energy Regulatory Commission and the U.S. Department of the Interior United States Fish and Wildlife Service Regarding Implementation of Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds*" that focuses on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. This voluntary memorandum does not waive legal requirements under the Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, ESA, or any other statutes and does not authorize the take of migratory birds.

Construction of the Rover Project would impact a total of 3,000.6 acres of upland forest, 5,328.0 acres of agricultural land, 762.9 acres of open upland, 160.0 acres of wetlands (of which 33.4 acres would be forested wetlands), 17.5 acres of waterbodies, and 293.6 acres of developed land. Impacts of individual Project components (the pipeline, aboveground facilities, contractor yards, and access roads) upon vegetation types are discussed in section 4.5. A pipeline construction right-of-way 75 to 150 feet wide would be cleared, depending on several factors (e.g., pipe size, land cover, slope) and as described in section 2.2.1.2. Construction areas for aboveground facilities, new and improved access roads, and portions of extra workspace would also be cleared. Rover has committed to limit land clearing to October 15 to March 31, as described in section 4.7.2. However, based on comments received from the FWS, we are recommending that Rover adhere to the FWS clearing windows of November 15 to March 31 in West Virginia and October 1 to March 31 in all other states as these timeframes would avoid impacts on both migratory birds and listed bat species (see section 4.7.2).

During the migratory bird nesting season, construction activities resulting in habitat modification or removal could have direct and indirect effects on migratory bird courtship, nesting, and reproduction. Potential effects include abandonment or destruction of active nests and loss of nesting and foraging habitat. The effects would be short-term in areas where successful revegetation of the habitat would be accomplished within 3 years of construction. Long-term and permanent effects would take place in forested areas and within the permanent pipeline easement.

In wetlands, Rover proposes to conduct routine vegetation maintenance within the permanent easement as necessary to maintain the 10- or 30-foot-wide corridor in an herbaceous state over the pipeline; the larger width being associated with locations where the dual pipelines are installed. In addition, trees and shrubs that are within 15 feet of the pipeline may be cut and removed from the right-of-way. Mowing and clearing activities associated with pipeline right-of-way maintenance would not take place between April 15 and August 1. Maintenance of the permanent right-of-way would create smaller contiguous tracts of forest habitat and could reduce available feeding and nesting habitat for certain migratory bird species. The loss of interior forest habitat could result in mobile species permanently populating adjacent habitats, which could increase competition and stress on a long-term basis. However, the creation of additional edge habitat could benefit certain species by providing travel corridors and additional forage habitat.

Rover consulted with the FWS regarding Project-related impacts on migratory bird species and Project-specific conservation and mitigation measures (FWS, 2015a). On April 15, 2015, Rover and the FWS met in Columbus, Ohio. Discussions at this meeting were focused on compliance with the Migratory Bird Treaty Act including adherence to right-of-way clearing windows and potential mitigation for any BCC habitat impacts. The FWS requested detailed information on impacted habitats in order to calculate mitigation requirements. The requested information included evaluation of ages and species composition of affected forested tree stands and impacted acreages for each habitat by either state or county. On May 13, 2015, Rover provided the FWS with areas along its Project route where tree clearing would be postponed until fall of 2016 to avoid the bat roosting and bird nesting seasons. During this meeting, the FWS expressed particular concern for impacts on BCCs from Carroll County, Ohio during tree clearing along the eastern portion of the Mainline A and B route in and around the southwest portions of the Supply Lateral routes. This concern was based on the amount of contiguous forest in these areas.

Rover and the FWS also discussed the need for BCC surveys for forest areas where bat surveys would not be conducted due to the known lack of bat presence. The FWS stated that surveys in these areas could be helpful to identify areas where BCCs are not present; however, the chances are low that Rover would find areas devoid of BCCs. As a result, Rover decided not to conduct surveys in these forest areas and would instead assume the presence of BCCs in these non-surveyed forest areas. The FWS stated that it is working with the field offices and Migratory Bird divisions to identify the time of year when BCCs would be nesting and that the FWS would request that Rover not conduct tree clearing during that time. On June 3, 2015, the FWS identified the period of May 15 through August 15 as the recommended dates to restrict tree clearing to avoid the known nesting periods of most BCCs in the Rover Project area. As discussed in section 4.7.2, we are recommending that Rover restrict all tree clearing to between October 15 and March 31 for the entire Project to avoid impacts on listed bat species. Because this timing window encompasses the clearing window for Migratory Birds (and is further restrictive), this recommendation would also avoid impacts on Migratory Birds.

Rover has drafted a Migratory Bird Conservation Plan to address avoidance and minimization of Project impacts and to provide mitigation plans. Rover states it will file updated versions of this plan as the consultation with the FWS continues and definitive actions are identified. However, the Rover Project could have direct and indirect impacts on migratory birds; therefore**, we recommend that:**

- **<u>Prior to construction</u>, Rover should file with the Secretary, for review and written approval of the Director of OEP, its final Migratory Bird Conservation Plan that includes documentation of its consultation with the FWS regarding avoidance, minimization, and mitigation measures.**

The Panhandle Project would be constructed and operated on developed lands within existing facilities on land owned or leased by the applicant and on agricultural lands; therefore, impacts on migratory birds would be minor. Similarly, the Trunkline Project would be constructed and operated on developed lands within existing facilities on land owned or leased by the applicant. Therefore, impacts from both these Projects on migratory birds would be minor.

Bald Eagle

The FWS delisted the bald eagle in 2007; however, bald and golden eagles are additionally protected under the MBTA and the BGEPA (16 USC 668-668d), which prohibits the taking of eagles, their eggs, or their nests. Bald eagles mate for life and will often choose a large tree near water in which to nest year after year. Nests are enlarged each year and may reach 10 feet across and weigh a half ton. The breeding season can begin as early as late February, and young generally fledge by early July (The Eagle Institute, 2013).

The FWS recommends that tree clearing not occur within 660 feet of a bald eagle nest or within any woodlot supporting a nest tree. To prevent disturbance of bald eagles during nesting and fledging, FWS recommends construction activities within 660 feet of any nest or that within the direct line of sight of a nest be restricted from January 15 through July 31. Three known eagle nests are present in the vicinity of the Rover Project: one in Stark County (about 770 feet north-northeast of MP MAB 48.2); one near the Ashland/Richland county line (near MP MAB 95.5); and one about 200 feet northeast of MP MAB 155.2.

The nest in Stark County is not within the restricted areas recommended by the FWS and therefore no mitigation is required. The nest near the Ashland/Richmond County line is in a riparian area that would be crossed by an HDD. The nest is 1,100 feet from HDD entry site and about 1,300 feet from the HDD exit site. Rover has stated that no construction activities, including tree clearing, would occur between MPs MAB 155.0 and MAB 155.25 during the period of January 15 through July 31, thus avoiding impacts on the nest near MP MAB 155.2. Since Rover would avoid impacts on the nests, we conclude that the Rover Project would not significantly impact the bald eagle.

4.6.2 Aquatic Resources

4.6.2.1 Existing Aquatic Resources

The Rover Project would require a total of 864 waterbody crossings with over 75 percent being less than 10 feet wide; 8 of these waterbodies are over 100 feet wide at the proposed crossing locations (see table 4.6.2-1). A total of 139 drainage ditches (roadside and non-roadside) would also be crossed by the Rover Project in West Virginia, Ohio, and Michigan. Water flow within ditches, as defined by Rover, are temporary in nature with primary use for agricultural practices (Rover Procedures). Therefore, drainage ditches are not expected to support fishery resources. A more detailed characterization of the waterbodies that the Rover Project would cross is provided in section 4.3. A total of 54 waterbodies and 12 ditches would be crossed by temporary or permanent access roads with almost all of the access roads consisting of existing bridges. None of the aboveground facilities or contractor yards would result in impacts on fisheries resources. Therefore, these facilities are not discussed further in this section.

TABLE 4.6.2-1

Summary of Waterbodies Potentially Crossed by the Rover Pipeline Project

	Minor (<10 feet wide)	Intermediate (10 to 100 feet wide)	Major (>100 feet wide)	Total
Michigan	25	20	3	48
Ohio	487	124	2	613
Pennsylvania	25	4	0	29
West Virginia	140	31	0	171
West Virginia/Ohio border	0	0	3	3
TOTAL	**677**	**179**	**8**	**864**

Construction of the Panhandle and Trunkline Projects would not directly affect surface water resources. Therefore, no impacts on fisheries or aquatic species would result from these Projects and they are not discussed further in this section.

Pennsylvania

In Pennsylvania, Title 25 of the Pennsylvania Code, Chapter 93, provides the Commonwealth's Water Quality Standards. All waters within Pennsylvania have been classified according to present condition and use. As discussed in section 4.3.3.3, the PADEP classifies waterbodies according to water quality and aquatic communities. In Chapter 93 waterbodies in the state are classified as: coldwater fisheries, warmwater fisheries, migratory fisheries, and trout stocked. Selected waterbodies are further classified as HQ or EV and given special protection. Waterbodies that are classified as HQ exceed levels necessary to support fish, shellfish, wildlife, and recreation, whereas waterbodies classified as EV are in significant natural areas, provide exceptional ecological significance, or are designated as a "wilderness trout stream" (Pennsylvania Code, 2015). The PAFBC further classifies waterbodies supporting trout populations or providing habitat as: Approved Trout Water, Class A Trout Waters, Special Regulation

Areas, Stream Sections that Support Natural Reproduction of Trout, and Wilderness Trout Streams; trout streams and their applicable tributaries are the only streams with a PFBC-recommended crossing window.

The Rover Project would cross two waterbodies classified as Approved Trout Waters in Washington County; Kings Creek (MP BGL 6.5), and two crossings of Aunt Clara Fork (MPs BGL 8.8 and BGL 9.4). These waters are also classified as coldwater fisheries. None of the other 26 waterbody crossings proposed by the Rover Pipeline Project in Pennsylvania are classified as HQ, EV, or as supporting trout populations or habitat. No waterbodies would be crossed by access roads or aboveground facilities in Pennsylvania. Two waterbodies are located within the construction workspace, both considered warmwater fisheries.

Rover is proposing to cross the two Approved Trout Waters (MPs BGL 6.7 and BGL 9.4) using a dry crossing method (flume or dam-and-pump). Rover would further minimize impacts on fisheries resources within these waterbodies by adhering to the recommended construction windows, which restricts in-stream work in Approved Trout Waters between March 1 and June 15 to avoid impacts on recreational angling (see table 4.6.2-2) (Smith, 2015). Potential impacts on surface waters from wet open-cut and dry-ditch methods are discussed in section 4.3.3.

TABLE 4.6.2-2

Construction Timing Restrictions for Waterbodies Containing Sensitive Fisheries Crossed by the Rover Pipeline Project a

State	Fishery Classification	Construction Restriction Window	In-Stream Work Window	Applicable Regulations
Michigan	None Identified	None Identified	None Identified	None
Ohio	Exceptional Warmwater, Warmwater and Coldwater Fisheries (native fauna) and Stream Reaches with Threatened and Endangered Species	April 15 through June 30	July 1 through April 14	Statewide In-Water Work Restriction Periods and Locations
Pennsylvania	Approved Trout Waters	March 1 through June 15	June 16 through February 28	PFBC Trout Designations
West Virginia	None Identified	None Identified	None Identified	None; A Stream Activity Application is Required

a Construction timing restrictions for crossing with threatened and endangered species of concern are addressed in section 4.7

West Virginia

In West Virginia, Title 47 Code of State Rule Series 2 of the West Virginia regulations (47 CSR 2) – *Requirements Governing Water Quality Standards* provides the state's water quality standards. Under 47 CSR 2, waterbodies in the state are categorized by designated use. Category A waters are designated as public water supply; Category B waters are for propagation and maintenance of fish and other aquatic life; Category C waters are designated as water contact recreation; Category D waters are for agriculture and wildlife use; Category E waters are designated as industrial water supply. Category B includes two subsets regarding fisheries; Category B1 – Warmwater Fishery Streams (streams or stream segments which contain populations composed of all warmwater aquatic life), and Category B2 – Trout Waters (waters which sustain year-round trout populations). Excluded from this category are those waters which receive annual stockings of trout but which do not support year-round trout populations. A list of Designated Trout Waters is provided in 47 CSR 2.

According to the WVDNR, sections of Wheeling Creek are stocked with trout once in February, and once every 2 weeks in March through May. However, the section of Wheeling Creek that would be crossed at MP MJL 2.6 is designated as warmwater by the WVDNR and is not directly stocked with trout (WVDNR, 2015a). No streams would be crossed by aboveground facilities in West Virginia. Forty-five waterbodies in West Virginia would be within the construction workspace, all considered warmwater fisheries.

The remaining waterbodies in West Virginia that would be crossed by the Rover Project are not designated as Category B2 – Trout Waters. Rover is proposing to cross most streams in West Virginia via open-cut methods, with the exception of 12 streams that would be crossed using HDD. The Ohio River would also be crossed via HDD at the West Virginia/Ohio border. Waterbody crossings are discussed further in section 4.3.3.

Ohio

The Ohio Administrative Code (OAC), Chapter 3745-1, designates the state's Water Quality Standards. Each waterbody in the state is assigned one or more designated aquatic life habitat uses, including designations for aquatic life habitat and a water use. Ohio's Water Quality Standards contain two distinct elements: 1) designated uses and 2) numerical or narrative criteria designed to protect and measure attainment of the uses. Designated uses for aquatic life are further categorized as one of seven designations: 1) warmwater; 2) limited warmwater; 3) exceptional warmwater; 4) modified warmwater; 5) seasonal salmonid; 6) coldwater; or 7) limited resource water. The coldwater streams are further subdesignated into "coldwater habitat – inland trout streams" and "coldwater habitat – native fauna." Coldwater habitat – inland trout streams are described as "waters which support trout stocking and management under the auspices of the OHDNR, Division of Wildlife, excluding lake run stocking programs, lake or reservoir stocking programs, experimental or trial stocking programs, and put-and-take programs on waters without, or without the potential restoration of, natural coldwater attributes of temperature and flow" (Ohio Code, 2014). Coldwater habitat – native fauna is described as "waters capable supporting populations of native coldwater fish and associated vertebrate and invertebrate organisms and plants on an annual basis" (Ohio Code, 2014). Exceptional warmwater habitat is described as "waters capable of supporting and maintaining an exceptional or unusual community of warmwater aquatic organisms having a species composition, diversity, and functional organization comparable to the seventy-fifth percentile of the identified reference sites on a statewide basis" (Ohio Code, 2014).

In Ohio, the Rover Project would cross 25 designated coldwater habitat – native fauna streams, 3 designated exceptional warmwater habitat streams in Belmont County (Captina Creek at MP CLL 6.1, and 2 unnamed tributaries to Captina Creek at MPs CLL 5.0 and CLL 5.9). All of the 25 coldwater habitat – native fauna streams are minor crossings (less than 10 feet in width). The Burgettstown Lateral would cross the majority of the coldwater habitat streams (17 crossings) in Jefferson County, through unnamed tributaries of Island Creek, Clay Lick, Grassy Run, and Leas Branch. Mainlines A and B would cross the remaining seven coldwater habitat streams in Ashland County, through unnamed tributaries of Oldtown Run and Newell Run. Captina Creek is proposed to be crossed via HDD, therefore direct impacts on this waterbody are anticipated to be avoided. Two exceptional warmwater habitat streams (unnamed tributaries to Captina Creek at MPs CLL 4.98 and CLL 5.92) would be crossed via open-cut methods (if the waterbody is dry at the time of crossing) or dry-ditch methods (if the waterbody is flowing at the time of crossing). Per OHDNR recommendations, in-stream work within exceptional warmwater habitat streams must take place between July 1 and April 14 (Surrena, 2015). A total of 107 waterbodies would be within the construction workspace in Ohio, all considered warmwater fisheries.

The OHDNR recommends that in-stream work within exceptional warmwater and coldwater habitat, native fauna designated streams take place between July 1 and April 14 (Surrena, 2015). This in-stream work restriction also applies to streams identified to contain threatened or endangered species. The Rover Project would not cross any OHDNR-designated coldwater habitats - inland trout streams, stocked trout waters, or designated percid (perch family) streams or salmonid streams.

Michigan

In Michigan, Part 4 Rules (of Part 31, Water Resources Protection, of Act 451 of 1994) specifies water quality standards for all waters of the state. The rules require that all designated uses of the receiving water be protected. Michigan's designated uses include: agriculture, navigation, industrial water supply, public water supply at the point of water intake, warmwater or coldwater fish and other indigenous aquatic life and wildlife, partial body contact recreation, and total body contact recreation from May 1 to October 31.

The MIDNR has established a list and a map of the designated inland waters that contain trout and salmon (MIDNR, 2015a, 2015b). In addition to designating these waterbodies as trout and salmon streams and lakes, Michigan has further classified waters based on the fishing season dates, the types of bait allowed, and the minimum size requirements. The Rover Project would not cross any MIDNR-designated trout or salmon streams or lakes in Michigan. Ten waterbodies in Michigan would be within the construction workspace, all considered warmwater fisheries.

4.6.2.2 Fisheries of Special Concern

Rover consulted with various federal and state agencies in the Rover Project area to identify waterbodies that may contain federally or state-listed threatened, endangered, or candidate species and their habitats, coldwater fisheries, and other fisheries resources that could be considered fisheries of special concern. The National Marine Fisheries Service has not identified any designated essential fish habitat in the Rover Project vicinity (NOAA, 2015). Threatened and endangered species are discussed in section 4.7.

No commercial fisheries were identified in the vicinity of the Rover Project; however, fisheries of significant recreational value (i.e., those that support stocking programs, natural populations, or spawning of native trout species) would be crossed. Although fisheries of special concern are given additional considerations based on the value of their resources, general impacts on each of them would be similar to those for general fisheries as discussed in section 4.6.2.3.

In Pennsylvania, the PFBC identified two waterbodies classified as fisheries of special concern that would be impacted by construction of the pipeline in Pennsylvania (Smith, 2015). These Approved Trout Waters are discussed above in section 4.6.2.1. In Ohio, the OHDNR identified 28 waterbodies classified as fisheries of special concern; 25 coldwater habitat – native fauna streams and 3 designated exceptional warmwater habitat streams in Belmont County (Captina Creek at MP CLL 6.1 and 2 unnamed tributaries to Captina Creek at MPs CLL 4.98 and CLL 5.92) would be crossed by the Rover Project. Captina Creek is proposed to be crossed via HDD, therefore direct impacts on this waterbody are not expected. Consultation with the WVDNR and the MIDNR determined that no waterbodies classified as fisheries of special concern would be impacted by construction or operation of the pipeline, nor would any be impacted by additional temporary workspace in West Virginia or Michigan.

According to Rover's Procedures, unless expressly permitted or further restricted by the appropriate agency, in-stream work would occur from June 1 through September 30 (coldwater fisheries), and June 1 through November 30 (coolwater and warmwater fisheries). Further, Rover has committed to adhering to the state agency recommendations for in-stream construction restrictions (e.g., the OHDNR timing window discussed above), and as outlined in table 4.6.2-2, to mitigate for impacts on these fisheries of special concern.

4.6.2.3 General Impacts and Mitigation

Rover proposes to cross a majority of the waterbodies (789 of 864 crossings) in the Rover Project area using an open-cut method. To minimize construction impacts on aquatic resources, Rover is proposing to use a dry-ditch crossing method for all coldwater fishery and exceptional warmwater perennial waterbodies. Intermittent and ephemeral tributaries to coldwater fishery and exceptional warmwater perennial waterbodies would be crossed by open cut if there was no flow (dry stream bed), or by dry-ditch methods if there was flow at the time of construction (see section 4.3.2.5). All major waterbodies (i.e., those greater than 100 feet wide), and those sensitive waterbodies identified by federal and state agencies would be crossed using the HDD method (45 crossings), unless otherwise specified. Details regarding waterbody crossings and alternative methods for proposed trenchless crossings are described herein and in section 4.3.3.

The proposed crossing method for each waterbody crossed by the Rover Project is provided in appendix L. Open-cut construction could result in increased turbidity and sedimentation in the crossing vicinity, potentially decreasing the dissolved oxygen, thereby potentially suffocating the eggs and larvae of fish and invertebrates. Sedimentation could displace the more mobile species and potentially smother benthic invertebrates, decreasing prey availability for fish. These effects could degrade the quality of the habitat, making it unsuitable for spawning and rearing activities. Impacts from open-cut construction would be temporary and limited to the crossing location and areas immediately downstream. Impacts would normally be limited to a few days, and generally no longer than 1 month after construction ends, depending on conditions at the crossing, the type and amount of suspended sediment, and other factors. Trenchless methods generally would not result in direct impacts on the waterbody.

In Washington County, Pennsylvania, the Rover Project would impact two waterbodies capable of sustaining coldwater fisheries. In Ohio, the Rover Project would cross 25 waterbodies capable of sustaining coldwater fisheries and 3 waterbodies with exceptional warmwater habitat. These would be crossed using dry crossing methods (dry-ditch or HDD) to minimize impacts.

No waterbodies could be affected by aboveground facilities associated with the Rover Project. No open water areas would be filled or converted to a different land use cover type as a result of the Rover Project. A total of 54 waterbodies and 12 ditches would be crossed by access roads, all but four are crossed by existing roads with existing bridges in place. The remaining four waterbodies would be crossed by new access roads using equipment bridges and flumes, as depicted in appendix D. Rover would minimize impacts on waterbodies that are crossed by access roads or are located within the aboveground facilities' area of disturbance by adhering to its Procedures.

Rover would adhere to BMPs described in its CMPs to mitigate impacts on aquatic resources, including the use of erosion and sediment control measures, use of temporary equipment bridges to transport construction equipment, and limiting in-stream equipment required to construct the crossing. Rover would design equipment bridges to prevent soil from entering the waterbody, allow unrestricted flow, and withstand maximum flows at each location. Rover indicated that in cases where waterbodies would be within the construction right-of-way, but not directly crossed by the pipeline, impacts would be limited to installation of equipment crossings such as bridges or clearing of vegetation adjacent to the stream. Rover committed to maintain a 15-foot-wide undisturbed vegetation buffer between construction activities and the waterbody (and any adjacent wetland) where feasible.

Rover would implement measures described in its CMPs to minimize impacts on fisheries resources. These measures include:

- completing waterbody crossings during appropriate in-stream construction windows and completing open-cut crossings within 24 to 48 hours for minor and intermediate crossings, respectively;
- installing temporary erosion controls and maintaining flow rates;
- dispersing any downstream discharges to minimize scour and downstream siltation;
- using clean gravel or native cobbles for the upper 1 foot of trench backfill in all waterbodies that contain coldwater fisheries;
- crossing waterbodies perpendicular to the channel or as close as practicable; and
- restoring stream channels to their original contour and stabilizing banks.

Following construction, Rover would allow a 25-foot-wide riparian strip along each waterbody bank to revegetate with native flora in order to stabilize banks, reduce erosion impacts, and provide shading and cover for fisheries resources. While stream temperature changes are possible temporarily following clearing of riparian vegetation, the reduction in shading across the permanently maintained corridor would not likely influence a temperature change (Beschta and Taylor, 1988).

Horizontal Directional Drill Crossings

Rover proposes to cross 45 waterbodies using HDDs as described in sections 2.3.2 and 4.3.3. The use of an HDD allows the pipeline to be installed beneath the bed of a waterbody without affecting aquatic resources. Potential impacts associated with HDD crossings include erosion or sedimentation associated with the onshore operation of the HDD equipment and inadvertent releases of drilling fluids and associated impacts on water quality and aquatic organisms.

Drilling entry and exit points and workspaces are locations with an increased likelihood of inadvertent releases of drilling fluids and are typically located away from the waterbodies crossed to minimize potential impacts. Although drilling mud consists of non-toxic materials, it may leak through unidentified fractures below the streambed, either along the path of the HDD or in adjacent areas. The majority of inadvertent releases occur close to the HDD entry or exit points; however, drilling mud could also be released into a waterbody and settle on the stream bed, temporarily inundating the habitats used by these species. Benthic and less mobile resources as well as spawning and nursery habitat could be impacted from the settling of drilling mud. In addition, increased sedimentation and turbidity within waterbodies could impact predator/prey interactions and reproductive success. During the HDD process, Rover personnel and the contractor would conduct visual and pedestrian inspections along the drill path and continuously monitor drilling mud pressures and return flows. As detailed in the HDD Plan, if drilling mud were released into a waterbody, Rover's contractor would take immediate action to control any inadvertent releases, clean up the affected area, and make adjustments to minimize or prevent recurrence.

Dry-ditch Crossings

Rover would cross perennial coldwater fishery waterbodies using dry-ditch methods (19 waterbodies). In addition, Rover would use dry-ditch methods to cross ephemeral or intermittent tributaries to these perennial coldwater fishery waterbodies as well as tributaries to exceptional warmwater perennial waterbodies, if there was flow present in the tributaries at the time of construction (11 tributaries). Captina Creek is the only exceptional warmwater perennial waterbody that would be crossed by the Rover Project, and it would be crossed using HDD methods.

Open-cut Crossings (Wet)

Rover proposes to use the open-cut method for most of the waterbodies that would be crossed by the Rover Project. Wet, open-cut construction methods involve trenching within the waterbody under flowing conditions with backfill and restoration occurring quickly (typically within 24 to 48 hours) to limit impacts on the stream.

Open-cut construction would result in temporary increases in turbidity and sedimentation in the crossing vicinity, potentially decreasing the dissolved oxygen, thereby potentially suffocating the eggs and larvae of fish and invertebrates. Sedimentation could displace the more mobile species and potentially smother benthic invertebrates, decreasing prey availability for fish. These effects could degrade the quality of the habitat, making it unsuitable for spawning and rearing activities. Generally, the open-cut crossing method is the quickest way to cross a waterbody, which allows for some impacts to be very short in duration. Impacts from open-cut construction would be temporary and limited to the crossing location and areas immediately downstream. Impacts would normally be limited to a few days, and generally no longer than 1 month after construction ends, depending on conditions at the crossing, the type and amount of suspended sediment, and other factors. BMPs would be utilized to further minimize sedimentation in the waterbody during construction until revegetation is successful.

Clearing vegetation from the edges of waterbodies at the pipeline crossing location could reduce availability of habitat for fishery resources by reducing shade for the waterbody, diminishing escape cover, and locally elevating water temperatures. Further, higher water temperatures could potentially reduce levels of dissolved oxygen. In accordance with the Rover Procedures, clearing of trees and other vegetation would be restricted to only what is necessary to safely construct and operate the pipeline to minimize potential effects associated with loss of riparian shade and vegetation cover. Following construction, Rover would restore streambeds and banks. Post-construction maintenance (or mowing) would be limited to that needed to facilitate periodic corrosion/leak surveys or to protect the integrity of the pipeline coating.

Blasting

In-stream blasting could injure or cause mortality to aquatic organisms close to blasting activities. Temporary and minor impacts on aquatic resources from blasting activities would be expected. While blasting is not anticipated for the Rover Project, Rover's Blasting Plan provides measures to minimize the potential impacts on aquatic resources if it becomes necessary to blast in waterbodies. These measures include the development of a detailed blasting plan by the pipeline contractor for in-stream blasting. The plan would include the identification of explosives, charges, and firing sequences to minimize shock wave stress on aquatic life in the vicinity of the blast area.

Hydrostatic Test Water

To comply with DOT regulations, Rover would conduct hydrostatic testing of the pipeline prior to placing it into service (see section 4.3). Rover proposes to use 40 waterbodies as sources of hydrostatic test water, none of which contain sensitive fisheries or fisheries of special concern. Where waterbodies are used for hydrostatic test water withdrawals, a screened intake would minimize the potential for entrainment of fingerlings and small fish during water withdrawal.

Rover would mitigate impacts on aquatic resources by adhering to its CMPs, which include the use of mesh screens on intake pumps to reduce the impingement and entrainment of fishes, maintaining base flow during hydrostatic test water withdrawals, discharge of test water in well-vegetated upland areas, and control of the flow rate to prevent erosion, streambed scour, and sedimentation.

All test waters would be withdrawn and discharged in compliance with the Rover Procedures and any state-specific requirements included in the applicable state discharge permits. Rover's Procedures specify that hydrostatic testing would not use as source water (or discharge points) either EV waters, waterbodies that provide habitat for federally listed threatened or endangered species, or public water supply waters, unless approved by the appropriate agency. With Rover's proposed measures, we conclude that hydrostatic testing would not significantly impact aquatic resources. Rover would also apply for hydrostatic test permits prior to construction. The permits would detail discharge timing, volume, and locations.

Spill Prevention, Control, and Countermeasures

Accidental spills of construction-related fluids (for example oil, gasoline, or hydraulic fluids) into waterbodies could result in water quality impacts that affect fish and other aquatic organisms in adjacent streams, if present. The potential impact would depend on the type and quantity of the spill, and the dispersal and attenuation characteristics of the waterbody. Minimization and mitigation procedures related to water quality are discussed in section 4.3.3.6. To reduce the potential for surface water contamination and resulting impacts on aquatic life, Rover would implement its Spill Procedures, which include BMPs to minimize the potential for accidental releases and measures that would be implemented to clean up any releases. Additional measures in Rover's CMPs include conducting routine inspections of construction equipment, tanks, and storage areas to help reduce the potential for spills or leaks; restricting refueling and the handling of hazardous materials to greater than 100 feet from wetland and waterbody resources; and the use of secondary containment around all containers and tanks. With adherence to these measures, we conclude that impacts on aquatic resources from potential spills would be adequately minimized.

4.6.2.4 Conclusion

Based on our review of potential Project impacts on aquatic resources as described above, we conclude that the Rover Project would result in some temporary impacts on aquatic resources, but that these impacts would be adequately mitigated through adherence to the measures described in Rover's CMPs, agency recommendations regarding the timing of construction activities, and Rover's use of dry crossing methods for coldwater fisheries and exceptional warmwater habitat.

4.7 SPECIAL STATUS SPECIES

Special status species are those species for which federal or state agencies afford an additional level of protection by law, regulation, or policy. For the Rover Project, special status species of plants and animals include species officially listed by the states of Pennsylvania (34 Pa.C.S.A. § 2167; 34 Pa.C.S.A. § 2924; 34 Pa.C.S.A. § 925; 32 P.S. §§ 5301 – 14), Ohio (R.C. § 1518.01 - 1518.99; 1531.25, 1531.99), Michigan (Michigan Compiled Laws Annotated § 324.6501 – 07) or the federal government as endangered or threatened (as per the ESA), or species of special concern. West Virginia currently does not have specific laws pertaining to special status species; however, all West Virginia freshwater mussel species are managed by the WVDNR.

Rover conducted surveys for listed species and their habitats required by the FWS and state resource agencies between May 2015 and June of 2016. Reports of the survey findings and proposed avoidance, conservation, and mitigation measures have been completed by Rover and submitted to the FERC and other federal and state agencies for review.

The Panhandle and Trunkline Projects would be constructed and operated on previously disturbed lands at existing facilities sites or on parcels owned or leased by the applicants. Further, no tree clearing would be required for these Projects and no waterbodies would be crossed or impacted, therefore we conclude that there would be *no effect* on special status species for these two Projects. As such, the Panhandle and Trunkline Projects are not discussed further in this section.

4.7.1 Regulatory Requirements and Species Identification

The ESA requires each federal agency to ensure that any actions authorized, funded, or carried out by the agency do not jeopardize the continued existence of a federally listed endangered or threatened species, or result in the destruction or adverse modification of the designated critical habitat of a federally listed species. As the lead federal agency, the FERC is required to consult with the FWS and/or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) to determine whether federally listed endangered or threatened species or designated critical habitat are found in the vicinity of a proposed project, and to determine the proposed action's potential effects on those species or critical habitats. Rover, acting as the FERC's non-federal representatives for the purpose of complying with Section 7(a)(2) of the ESA, initiated informal consultation with the FWS on June 25, 2014. Rover submitted consultation letters to the FWS offices in the Rover Project area, including the West Virginia, Pennsylvania, Ohio, and Michigan Field Offices. Additionally, Rover has consulted with the Midwest Regional Office of the FWS, the OEPC, the WVDNR, the PADCNR, the PAGC, the PAFBC, the OHDNR, and the MIDNR.

For actions involving major construction activities with the potential to adversely affect listed species or designated critical habitat, the FERC must prepare a biological assessment (BA) for those federally listed species that may be affected and report its findings to the FWS and NOAA Fisheries (as applicable). If it is determined that the action would be likely to adversely affect a federally listed species, the FERC must submit a request for formal consultation to comply with Section 7 of the ESA. In response, the FWS and/or NOAA Fisheries would issue a biological opinion as to whether or not the federal action would likely jeopardize the continued existence of a listed species, or result in the destruction or adverse modification of designated critical habitat.

The FWS is responsible for terrestrial and freshwater species. Because Rover's Project may affect federally listed terrestrial and freshwater species, in compliance with Section 7 of the ESA, the FERC requests that the FWS consider the EIS, along with various survey reports prepared by Rover, as the BA for the Project. No federally listed species under the jurisdiction of NOAA Fisheries would be affected by the Projects.

In addition to federal law, Pennsylvania, Ohio, and Michigan have passed laws to protect state-listed threatened and endangered species. The state-specific regulations include the Pennsylvania ESA (Pennsylvania Code 58 §75.1-75.4), Ohio Conservation of Natural Resources (R.C. § 1518.01 - 1518.99), and Michigan Natural Resources and Environmental Protection Act (Michigan Compiled Laws Annotated § 324.6501 – 07). The overall goal of each of the state endangered species laws is to conserve, protect, restore, and enhance any listed species and their habitat.

Through FERC's and Rover's consultations with the protected species agencies and research, we have identified 16 federally listed species, 1 species proposed for federal listing as endangered, 1 species proposed for candidate status, and 58 state-listed species in the general area of the Rover Project. The potential effects of Rover's Project on these species are discussed below.

4.7.2 Federally Listed Species and Species Proposed for Listing

We reviewed the information submitted by Rover, performed our own research, and consulted with the agencies regarding federally listed species. According to the FWS, 16 federally listed species may be present in the Rover Project area in addition to 1 species proposed for federal listed as endangered and 1 species that is proposed for candidate status. Our determination of effect for each species is included in table 4.7.2-1 and described in the species-specific discussions below.

Mammals

Three species of listed bats could be present within the Rover Project area (see table 4.7.2-1). Rover conducted mist net surveys for Indiana bat, northern long-eared bat, and Virginia big-eared bat in West Virginia, Pennsylvania, Ohio, and Michigan from May 19 to July 30, 2015, in accordance with the FWS *April 2015 Range-wide Indiana Bat Summer Survey Guidelines*. During the same timeframe, Rover conducted potential roost tree (PRT) surveys and habitat plot assessments to further qualify and quantify the suitability of summer roosting by bats in the Project area.

Rover also conducted surveys in 2015 to identify cave and portal openings to address the potential for bat species presence within these habitats located within proposed workspaces. Cave-dwelling bats such as the Virginia big-eared bat utilize caves year round, whereas bat species such as the Indiana bat and northern long-eared bat utilize caves during the fall swarming, winter hibernation, and spring staging seasons. Three portal openings were identified as potentially suitable for use by bats pursuant to the *2012 Bat Survey Protocol for Assessing Use of Potential Hibernacula* (FWS, 2012d). Two portals were identified near MP MJL 1.0 in Marshall County, West Virginia, and one portal was identified near MP CLL 4.8 in Belmont County, Ohio. One additional portal identified near MP SWL 34 in Wetzel County, West Virginia was identified, but was not considered suitable for use by hibernating bats.

Surveys of the two portals in West Virginia were conducted on September 30 and October 1, 2015 using the *2011 Draft Protocol for Assessing Abandoned Mines/Caves for Bat Use* (FWS, 2011). Surveys of the portal in Ohio were conducted on September 24 and October 8, 2015, using current guidance provided to Rover by the FWS Ohio Field Office and the protocols referenced above. Based on field assessments, the portals in West Virginia and Ohio were determined unlikely to support fall swarming activities or provide winter hibernation habitat.

We previously recommended that Rover adhere to the FWS-approved seasonal tree clearing window for listed bat species. In the November 2015 Draft Biological Evaluation, Rover committed to restrict tree clearing for all Project areas to the FWS-approved seasonal window of October 15 to March 31. However, in comments received from FWS on the draft EIS, the FWS is recommending that the clearing window in Michigan, Ohio, and Pennsylvania occur between October 1 and March 31 and clearing in West Virginia be limited to between November 15 and March 31. Therefore, **we recommend that:**

- **<u>During construction of the Project</u>, Rover should adhere to the FWS tree clearing window and should restrict tree clearing activities to <u>between October 1 and March 31</u> in Michigan, Ohio, and Pennsylvania and <u>between November 15 and March 31</u> in West Virginia.**

TABLE 4.7.2-1

Federally Listed Species Potentially Occurring in the Rover Pipeline Project Area

Common Name	Scientific Name	Federal Status	State Status	Determination of Effect
Mammals				
Indiana bat	*Myotis sodalis*	E	PA-E; MI-E, OH-E, WV-S1	May Affect, Not Likely to Adversely Affect
Northern long-eared bat (aka northern myotis)	*Myotis septentrionalis*	T	PA-CR, OH-T	May Affect, Not Likely to Adversely Affect
Virginia big-eared bat	*Corynorhinus townsendii virginianus*	E	WV-S2	No Effect
Reptiles				
Eastern massasauga rattlesnake	*Sistrurus catenatus*	PT	OH-E, MI-SC	Not Likely to Jeopardize the Continued Existence
Copperbelly water snake	*Nerodia erythrogaster neglecta*	T	OH-E	No Effect
Amphibians				
Eastern hellbender	*Cryptobranchus alleganiensis*	Under evaluation for Federal Candidate status	OH-E	Would Not Contribute to a Trend towards Federal Listing
Mussels				
Clubshell	*Pleutobema clava*	E	OH-E, WV-S1	May Affect, Not Likely to Adversely Affect
Northern riffleshell	*Epioblasma torulosa rangiana*	E	OH-E, MI-E	No Effect
Rayed bean	*Villosa fabalis*	E	OH-E, MI-E	May Affect, Not Likely to Adversely Affect
White cat’s paw pearly mussel	*Epioblasma obliquata perobliqua*	E	OH-E	No Effect
Snuffbox	*Epioblasma triquetra*	E	PA-E, MI-E, WV-S2	May Affect, Not Likely to Adversely Affect
Fanshell	*Cyprogenia stegaria*	E	WV-S1	May Affect, Not Likely to Adversely Affect
Pink mucket	*Lampsilis abrupta*	E	PA-E, WV-S1	May Affect, Not Likely to Adversely Affect
Sheepnose	*Plethobasus cyphyus*	E	WV-S1	May Affect, Not Likely to Adversely Affect
Insects				
Hine’s emerald dragonfly	*Somatochlora hineana*	E	OH-E	No Effect
Mitchell’s satyr butterfly	*Neonympha mitchellii*	E	OH-E, MI-E	May Affect, Not Likely to Adversely Affect
Poweshiek skipperling	*Oarisma poweshiek*	E	MI-T	May Affect, Not Likely to Adversely Affect

TABLE 4.7.2-1 (continued)				
Federally Listed Species Potentially Occurring in the Rover Pipeline Project Area				
Common Name	**Scientific Name**	**Federal Status**	**State Status**	**Determination of Effect**
Plants				
Eastern prairie fringed orchid	*Platanthera leucophaea*	T	OH-T, MI-E	No Effect

Sources:
Federal: FWS, 2014a, 2014b, 2014c
State: Thompson, 1997; OHDNR, 2014; MINFI, 2015; PANHP, 2015; PADCNR, 2015b; PAFBC, 2015a; WVDNR, 2015b

CR	=	Pennsylvania candidate rare	S1	=	West Virginia critically imperiled
E	=	endangered	S2	=	West Virginia imperiled
PE	=	proposed as endangered	SC	=	special concern
R	=	rare	T	=	threatened

However, the FWS West Virginia Field Office (WVFO) noted in its April 19, 2016 letter that seasonal tree clearing alone is not sufficient to avoid impacts on bat species and that the combined effects of the Project could result in adverse effects to federally listed bats and their habitat. The FWS recommended that Rover conduct additional site-specific surveys and that further consultation with the FWS would be necessary. In response to the FWS concerns, Rover conducted additional surveys in June 2016 and filed the final survey results in July 2016.

Indiana Bat

The Indiana bat is a federally listed endangered species, and is a state-listed endangered species in Ohio and Pennsylvania. Indiana bats are small, gregarious bats that congregate in winter and summer colonies, migrating between the two in spring and fall. Hibernating Indiana bats form large compact clusters of up to 5,000 bats per cluster. Hibernation requires cold temperatures (under 50 °F but above freezing) to maintain sufficiently low metabolic rates, thus ensuring that fat reserves last through the 6-month hibernation. Indiana bats show strong fidelity to their hibernacula, returning year after year (FWS, 2004). If bats are disturbed or cave temperatures increase, more energy is needed and bats may starve. Very few caves within the range of the species are appropriately cool, humid, and with stable temperatures suitable for Indiana bats (FWS, 2006a). In the summer, bats live in wooded or semi-wooded areas. Groups of females form maternity colonies to bear their offspring in crevices of trees or under loose bark. Dead trees are preferred roosting sites, but Indiana bats will also roost in human-made structures such as bridges, sheds, or houses. Males roost alone or in small groups.

Indiana bats eat a variety of flying insects found along rivers or lakes and in uplands. Threats to the species include anthropogenic disturbance and the spread of white-nose syndrome. White-nose syndrome is a contagious fungal disease affecting bats and with a potentially high mortality rate, and is known to be present in both Ohio and Pennsylvania. Critical habitat has not been designated for the species in either Ohio or Pennsylvania.

The FWS and Rover consulted with regard to the presence of Indiana bats in the Project area (FWS, 2014d, 2014e, 2014f). In West Virginia, the FWS informed Rover that the Project passed through a summer known-use area in Tyler County and that Rover should develop a Mytoid Bat Conservation Plan (MBCP) in addition to conducting surveys or assuming presence of Indiana bats. The FWS filed a letter on April 1, 2016, indicating that the MBCP had not yet received FWS approval. The FWS has recommended that in Ohio, unavoidable tree clearing in suitable habitat within Tuscarawas, Wayne, Seneca, Crawford, Monroe, and Noble Counties occur only from October 1 through March 31. In addition, FWS recommended summer surveys be conducted between June 1 and August 15 in suitable habitat in Stark, Wayne, Ashland, Richland, Crawford, Seneca, Hancock, Wood, Henry, Defiance, and Fulton County, Ohio.

Rover conducted mist net surveys and cave portal surveys in 2015 to identify areas where additional conservation measures would be needed for Indiana bats. No Indiana bats were captured during mist net surveys of areas of the Project previously scheduled for construction in spring/summer 2016, which included 435 sites along the Project route. Mist net survey results are pending for the Sherwood Lateral, CGT Lateral, and Majorsville Lateral. Cave portal surveys did not identify any suitable winter hibernacula for Indiana bat. The FWS WVFO, in its April 19, 2016 letter, indicated that in addition to its seasonal clearing restrictions and Rover's MBCP, surveys should be conducted for Indiana bat for all areas that fall outside of the known-use buffers to determine if federally listed bats are present. Based on Rover's implementation of its MBCP, its commitment to seasonal clearing restrictions and completing surveys for federally listed bat species, as well as our recommendation below, we conclude that the Project *may affect, but is not likely to adversely affect*, the Indiana bat.

Northern Long-eared Bat

The northern long-eared bat, also known as the northern myotis or northern long-eared myotis, was federally listed as threatened by the FWS on May 4, 2015 with an interim ruling under Section 4(d) of the ESA (FWS, 2015b). The FWS finalized the Section 4(d) rule on February 16, 2016, which provides measures that are necessary and advisable to provide for the conservation of the northern long-eared bat. Any take of northern long-eared bat occurring from activities outlined in the 4(d) rule, including pipelines, is not prohibited and does not require specific authorization by the FWS. The 4(d) rule does not exempt take as a result of adverse impacts on hibernacula. No conservation measures are required under the 4(d) rule unless the Rover Project involves tree removal within 0.25 mile of known northern long-eared bat hibernacula; or the Project proposes to impact trees within a 150-foot radius of a known, occupied maternity roost tree during the pup season from June 1 to July 31.

The northern long-eared bat is a medium sized bat with a body length of 3 to 3.7 inches and a wingspan of 9 to 10 inches. Northern long-eared bats spend winter hibernating in caves and mines with constant temperatures, high humidity, and no air currents. During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, and crevices of live or dead trees. Males and non-reproductive females may roost in cooler places such as caves or mines. Northern long-eared bats rarely roost in human structures.

Northern long-eared bats exhibit delayed fertilization. After copulating, females store sperm during hibernation until spring. In spring, the females ovulate and the stored sperm fertilizes the egg. Pregnant bats migrate to summer areas and roost in small maternal colonies where they give birth to a single pup in May or early June to late July. Northern long-eared bats feed on moths, flies, leafhoppers, caddisflies, and beetles, which they catch while flying through understory of forested areas or by gleaning from vegetation.

Northern long-eared bats have been negatively impacted by white-nose syndrome, impacts on hibernacula, loss or degradation of summer habitat (e.g., from highway construction or commercial development), clearing of trees, and wind farm operation (FWS, 2015b). Critical habitat has not yet been designated for the species. The FWS seasonal surveys and need for a MBCP recommendations for Indiana bat also would also apply to northern long-eared bat (FWS, 2014e, 2014f).

Rover conducted mist net surveys at Project areas that were scheduled for construction in spring/summer 2016. Mist net survey results are pending for the Sherwood Lateral, CGT Lateral, and Majorsville Lateral. A location along the Majorsville Lateral in Doddridge County, West Virginia was noted in the April 19, 2016 FWS WVFO correspondence as being within a 150-foot radius of a known northern long-eared bat maternity roost tree. However, as indicated in Rover's May 23, 2016 filing, further consultation with the FWS confirmed that the construction workspace is outside of the 150-foot buffer of this known roost tree.

Rover's mist net surveys resulted in the capture of 91 northern long-eared bats over 10 counties in Ohio, Pennsylvania, and West Virginia. Capture locations included Belmont, Carroll, Harrison, Jefferson, Monroe, Noble, Stark, and Tuscarawas Counties in Ohio; Washington County in Pennsylvania; and Hancock County in West Virginia. Of the 91 captured northern long-eared bats, 56 bats were fitted with transmitters and tracked to roosting locations. Radio telemetry tracking of the bats identified eight roost trees that were adjacent or within proposed Project workspaces. Rover has committed to avoiding these known roost trees by either reducing workspace or rerouting to avoid impacting the roost trees. Prior to the start of construction, once Rover files its Implementation Plan, the FERC will verify that all roost trees have been avoided based on final Project alignment sheets.

As noted above, Rover conducted surveys in 2015 to identify cave and portal openings to address the potential for bat presence within workspaces during the fall swarming, winter hibernation, and spring staging seasons. Portal surveys at these locations did not identify any suitable winter hibernacula for northern long-eared bats.

In addition to the clearing windows listed above, Rover would implement the following additional conservation measures to minimize impacts on the northern long-eared bat and Indiana bat, including:

- to the greatest extent practicable, minimize potential habitat removal in wetland and riparian habitats;
- where possible, Project features would be collocated with previously disturbed or cleared areas;
- education and training would be provided to operators, employees, and contractors working in areas of known or presumed northern long-eared bat habitat to provide details on the biology of the bats, activities that may affect the bats, and measures in place to avoid or minimize these effects;
- Rover would implement sediment and erosion control measures, ensure restoration of pre-existing topographic contours after any ground disturbance, and restore native vegetation upon completing work;
- areas that are temporarily impacted would be restored and monitored to ensure they are re-vegetated following construction; and
- in order to partially mitigate loss of bat summer roosting habitat within the 2015 occurrence buffers where they overlap with the proposed Rover Project alignment,
  - Rover would create roosting habitat in the vicinity of the Project alignment by girdling of trees on a 2:1 ratio for identified potential roost trees where landowner permission is granted; and
  - Rover would install artificial roost structures at a rate of 5 per 1 kilometer (km) for "rocket"-type houses, or 1 per 1 km for Brandenbark or similar advanced structures, where landowner permission is granted.

Even though Rover has indicated that the Project would adhere to the FWS seasonal clearing restrictions and provide the conservation measures listed above, the FWS recommended Rover continue to coordinate to determine appropriate conservation measures for the northern long-eared bat. Based on Rover's commitment to seasonal tree clearing restrictions, implementation of its MBCP, and our recommendation below, we conclude that the Project *may affect, but is not likely to adversely affect* the northern long-eared bat.

<u>Virginia Big-eared Bat</u>

The Virginia big-eared bat, a subspecies of Townsend's big-eared bat, is listed as endangered wherever it is found. The total population is estimated to be less than 20,000 individuals (WVDNR, 2006). Most of the decline has been attributed to human disturbance of cave roosts. Five caves in West Virginia have been designated as critical habitat for the species (FWS, 1979). The Virginia big-eared bat is a medium sized bat weighing less than 0.5 ounce. Hibernation occurs in caves that provide cold but above freezing temperatures. Like the northern long-eared bat, the Virginia big-eared bat exhibits delayed fertilization and gives birth to a single pup in May or June. Females form maternity colonies in warm caves where they rear their young. Virginia big-eared bats forage in a variety of habitats including old fields, hay fields, and forested areas and tend to return to the same feeding area night after night.

The FWS and Rover consulted with regard to the presence of Virginia big-eared bats in the Project area. The FWS did not include the Virginia big-eared bat as a species of concern for Rover during consultations. (FWS, 2014b). In addition, Rover conducted surveys in 2015 to identify cave portals within workspaces that may provide hibernacula and dwellings for bats. The cave portal surveys did not identify any suitable hibernacula or dwelling habitat for Virginia big-eared bat. Therefore, we conclude that the Project would have *no effect* on the Virginia big-eared bat.

Rover is still conducting surveys and coordinating with the FWS regarding federally listed threatened and endangered bat species that may be present in the Project area. Therefore, **we recommend that:**

- **Rover should not begin construction of the Rover Pipeline Project <u>until</u>:**
  - **a. all outstanding bat surveys have been completed;**
  - **b. species conservation plans and mitigation have been approved by the FWS or state regulatory authority;**
  - **c. the FERC staff completes any necessary ESA Section 7 consultation with the FWS; and**
  - **d. Rover has received written notification from the Director of OEP that construction and/or use of mitigation (including implementation of conservation measures) may begin.**

Reptiles and Amphibians

Two species of listed reptiles and one special status amphibian could occur within the Rover Project area (see table 4.7.2-1). Rover conducted surveys for each of these species as discussed below.

<u>Eastern Massasauga Rattlesnake</u>

The eastern massasauga rattlesnake is proposed as a federal threatened species. The final rule for listing of this species is expected in September 2016. The eastern massasauga rattlesnake is listed as endangered, threatened, or a species of concern by every state and province in which it lives. Massasaugas are small rattlesnakes with thick bodies that can grow to approximately 2 feet in length. Massasaugas live in wet areas including wet prairies, marshes, and low area along lakes and rivers.

Massasaugas will also use adjacent uplands during parts of the year for foraging. They often hibernate alone in crayfish burrows but are also found under logs and tree roots or in small mammal burrows. Massasaugas bear between 5 and 19 live young in late summer or early fall. Massasauga's diet consists mainly of small rodents like mice and voles but will sometimes eat frogs and other snakes. Primary threats to massasaugas include intentional eradication by humans and loss of both upland and wetland habitat (FWS, 2013a).

The eastern massasauga rattlesnake potentially occurs or has been reported in Crawford, Richland, and Wayne Counties, Ohio, and in all counties in Michigan (FWS, 2014e). The FWS-Ohio Field Office noted the potential occurrence of eastern massasauga rattlesnake in Wooster Township, Wayne County, Ohio (FWS, 2014e). The MINFI Rare Species Review noted that recorded occurrences of the eastern massasauga rattlesnake in proximity to the Rover Project in Portage Lake Fen.

An FWS-approved herpetologist conducted desktop and field habitat assessments of potential suitable habitat within the Rover Project area for the eastern massasauga rattlesnake. Potential habitat locations were identified in Wooster Township, Wayne County, Ohio and Washtenaw and Livingston Counties, Michigan. Suitable habitat includes low wet areas with the water table near the surface that adjoin drier open areas that contain a mix of grasses and forbs such as goldenrods and other prairie plants that may be intermixed with trees or shrubs.

Rover conducted a site visit in August 2015 at one site in Wooster Township, Wayne County, Ohio which resulted in a determination of low quality habitat and concluded that no further surveys were necessary at this location. Field site visits were conducted in September 2015 at seven sites in Washtenaw and Livingston Counties in Michigan. Based on the site visits, presence/absence surveys were conducted at four sites in early October 2015. No eastern massasauga rattlesnake were observed; however, these four sites contain suitable habitat for the species. The four sites are within an approximately 3.5-mile stretch between southern Livingston and northern Washtenaw Counties located at MPs MS 83.9 to MS 84.0 in Washtenaw County; and MPs MS 85.20 to MS 85.25, MPs MS 85.7 to MS 86.0, and MPs MS 87.10 to MS 87.85 in Livingston County.

Based on the fact that the Project will cross habitat that likely supports eastern massasauga rattlesnake, Rover has proposed the following avoidance and minimization measures:

- Rover would train all construction personnel in the identification of the eastern massasauga rattlesnake;
- Rover would conduct additional presence-absence surveys prior to construction at the four locations in Washtenaw and Livingston County, Michigan;
- following clearing operations at the four potential habitat sites, exclusion fence (silt fence) would be installed and maintained along the edge of the construction workspaces in suitable habitat to deter movement of eastern massasauga rattlesnake into the workspaces;
- workspaces and exclusion fences would be inspected each morning for any snakes or other wildlife prior to the start of construction in the area; and
- if the presence of eastern massasauga rattlesnake is identified at any location, a FWS-approved herpetologist would survey the construction work areas each morning and would collect and relocate any individuals to suitable habitat outside of the construction workspaces.

Additionally, we received comments from the FWS stating that, while the eastern massasauga rattlesnake is not currently listed, the FWS encourages additional mitigation measures to minimize impacts, including timing of clearing. We agree that a proactive stance would be prudent because the Rover Project may impact the eastern massasauga rattlesnake. Therefore, **we recommend that:**

- **<u>During construction of the Project</u>, Rover should restrict construction activities (including tree clearing) to <u>between October 31 and March 15</u> in areas identified as potential eastern massasauga rattlesnake habitat.**

With the incorporation of these conservation measures, as well as our recommendation, we conclude that the Rover Project *is not likely to jeopardize the continued existence* of the eastern massasauga rattlesnake.

<u>Copperbelly Water Snake</u>

The copperbelly water snake is listed as threatened under the ESA. Only a couple hundred snakes remain in the northern population segment, which includes southern Michigan, northeastern Indiana, and northwestern Ohio. The copperbelly water snake is a non-venomous snake that can grow up to 4 feet in length. Copperbelly water snakes need a mosaic of shallow wetlands surrounded by forested uplands. Seasonally flooded wetlands with no fish are favored foraging areas, and copperbellies frequently move from one wetland to the next. Copperbellies hibernate in crayfish burrows, in forested wetlands, and immediately adjacent to forested uplands from late October until early April. Courtship and mating occur in spring and young snakes are born live in the fall or in the winter burrow. The copperbelly water snake's diet consists mainly of frogs and tadpoles. The main threats to copperbelly water snakes include habitat loss and fragmentation, collection by rare pet traders, and predation by skunks, raccoons, raptors, and snapping turtles (FWS, 2013b). The copperbelly water snake is listed as potentially occurring in Defiance County, Ohio.

It was previously recommended that prior to construction Rover should file results of consultations with FWS regarding the copperbelly water snake. Based on consultations with FWS, the copperbelly water snake is not present in any townships crossed by the Rover Project in Ohio (Lott, 2015). Therefore, we conclude that the Rover Project would have *no effect* on the copperbelly water snake.

<u>Eastern Hellbender</u>

The eastern hellbender is a large, stout-bodied, fully aquatic salamander that can reach up to 29 inches in length. Eastern hellbenders are federal species of concern (FWS, 2014e) and an Ohio-listed endangered species (OHDW, 2015). Eastern hellbenders prefer clear, fast-flowing, well-oxygenated streams and rivers with large, flat boulders, logs, and debris. Because of their preference for clean streams and rivers, hellbenders serve as indicators of stream health. The presence of young and adults is a sign of good water quality. Hellbenders feed primarily on crayfish but will also eat insects, snails, minnows, and worms. Mating occurs in late summer and early fall when the male excavates a nest under flat rocks, debris, or in crevices. The male fertilizes the eggs as the female releases them. Eggs are bound together by a thin strand of jelly. The male guards the eggs during incubation until hatchlings emerge after 68-84 days. Water pollution (e.g., sewage, sedimentation, chemical runoff from lawns or parking lots) and impoundments are major factors in the decline of hellbenders. Sedimentation affects hellbenders by smothering and suffocating eggs or hatchlings and killing invertebrate prey (VIDGIF, 2015).

The eastern hellbender is known to occur in Captina Creek, Witten Fork and the Ohio River section in the vicinity of the Rover Project (FWS, 2014e). The FWS has indicated its possible presence in Captina Creek in Belmont County; Cross Creek, or Yellow Creek in Jefferson County; Sugar Creek in Tuscarawas County; Clear Fork of the Mohican River in Ashland County; or Clear Fork of the Mohican River in Richland County (FWS, 2014f). The Clarington Lateral would cross Captina Creek at MP CLL 6.1 in Belmont County, Ohio. Captina Creek would be crossed using an HDD; therefore, no impacts on hellbenders are expected at this location and no surveys were conducted.

The Rover Project would cross Witten Fork in two locations: MPs SWL 41.22 and SWL 42.08 in Monroe County, Ohio. Rover conducted a habitat assessment at the two Witten Creek crossings in August 2015 and no suitable habitat was identified at either crossing location. Due to the lack of suitable habitat at the Witten Creek crossings, no further surveys are scheduled and we conclude that the Rover Project *would not contribute to a trend towards federal listing* for the eastern hellbender.

Mussels

Eight species of federally listed freshwater mussels could occur within the Rover Project area (see table 4.7.2-1). Rover conducted surveys for freshwater mussels in West Virginia in accordance with the West Virginia Mussel Survey Protocol, March 2014 Version, in August 2015. Mussel surveys were conducted in August 2015 in Ohio and Michigan in accordance with 2015 Ohio Mussel Survey Protocol.

<u>Clubshell Mussel</u>

The clubshell is federally listed as endangered. It is a small to medium-sized mussel that can grow up to approximately 3 inches in size. Its wedge shaped shell is yellow to brown in color with green rays. This mussel inhabits areas with loose sand and gravel within small to medium rivers and feeds on microscopic organisms and plant material that it filters from the water column (FWS, 1997a). The clubshell is listed as potentially occurring in Doddridge and Tyler counties, West Virginia and Defiance and Hancock counties, Ohio (OHDNR, 2014).

The OEPC commented that Meathouse Fork, Middle Island Creek, and the Ohio River in Doddridge and Tyler counties, West Virginia, provide habitat for the clubshell. The Rover Project crosses Middle Island Creek at MPs SWL 13.2 and SWL 23.9, and the Ohio River at MP SWL 34.4 in Tyler County. Meathouse Fork is not crossed, but is within 1.6 miles west of the Sherwood Lateral between MPs SWL 0.0 and SWL 1.0.

Rover is proposing to cross these waterbodies by HDD. We conclude that the Rover Project *may affect, but is not likely to adversely affect* the clubshell mussel.

<u>Northern Riffleshell</u>

The northern riffleshell is a federally endangered freshwater mussel that can grow up to 2 inches in diameter. The shells of males and females are greenish-yellow to olive green in color. Males have a square shaped shell while the females have an oval shaped shell. The northern riffleshell inhabits areas of firmly packed sand or gravel within large streams and small rivers. The northern riffleshell filter feeds from the water column on microscopic organisms and plant material. (FWS, 1997b). The northern riffleshell potentially occurs in Defiance County, Ohio (OHDNR, 2014).

All waterbodies crossed by the Rover Project in Ohio are classified based on the Ohio Mussel Survey Protocol as Group 1 streams. Group 1 streams are defined as, "high quality streams listed by the state as having potential habitat for mussels, where federally listed species are not expected." A desktop assessment and field reconnaissance survey was conducted by a qualified malacologist in order to determine waterbodies which potentially contained listed mussel species. None of the streams crossed by the Rover Project in Defiance County warranted a full mussel survey and would likely not provide habitat for federally listed mussels. Therefore, we conclude that the Rover Project would have *no effect* on the northern riffleshell.

Rayed Bean Mussel

The rayed bean is a freshwater mussel that has been federally listed as an endangered species. The rayed bean is small, usually less than 1.5 inches long, with a yellowish-green or brown shell with numerous dark green wavy lines. The rayed bean generally lives in small headwater creeks although it is sometimes found in rivers and glacial lakes. It prefers sandy substrates and is often found near roots of aquatic vegetation (FWS, 2012a).

In Ohio, the rayed bean is listed as potentially occurring in Defiance, Fulton and Hancock counties. In Michigan, the rayed bean could occur in Lenawee County; however, the MINFI did not identify any specific locations or concerns for the rayed bean (MINFI, 2014). The species is known to occur nearby in the Huron River (2.5 miles east of Market Segment MP MS 79.0 in Washtenaw County) and the River Raisin. The Market Segment crosses the River Raisin at MP MS 62.4 in Washtenaw County. The River Raisin would be crossed using an HDD.

It is not known whether the rayed bean is present in the Rover Project area in West Virginia; therefore, the WVDNR recommended mussel surveys in Middle Island Creek and Sancho Creek (WVDNR, 2014). Per the OEPC, the Rover Project would be within 0.25 mile of Meathouse Fork, Middle Island Creek, and the Ohio River in Doddridge and Tyler counties, West Virginia, which provide habitat for the rayed bean. The Rover Project does not cross Meathouse Fork and Rover is proposing to cross Middle Island Creek using an HDD. Surveys at Sancho Creek did not identify the presence of rayed bean mussel. We conclude that the Rover Project *may affect, but is not likely to adversely affect* the rayed bean.

White Cat's Paw Pearly Mussel

The white cat's paw pearly mussel is a federally listed endangered freshwater mussel that can grow to approximately 2 inches in diameter. The shells of the males and females are yellowish-brown to brown in color; however, the males have an oblong shaped shell and the females have a rectangular shaped shell. The white cat's paw pearly mussel inhabits shallow waters of small rivers and streams that contain swift current (FWS, 2015c). The white cat's paw pearly mussel could potentially occur in Defiance County, Ohio (OHDNR, 2014). All waterbodies crossed by the Rover Project in Ohio are classified Group 1 streams and federally listed species are not expected. A desktop assessment and field reconnaissance survey was conducted by a qualified malacologist in order to determine waterbodies which potentially contained listed mussel species. None of the streams crossed by the Rover Project in Defiance County warranted a full mussel survey and would likely not provide habitat for federally listed mussels. Therefore, we conclude that the Rover Project would have *no effect* on the white cat's paw pearly mussel.

Snuffbox Mussel

The snuffbox is small- to medium-sized freshwater mussel that has been federally listed as an endangered species. The snuffbox is yellow, green, or brown with green rays, blotches, or chevron lines. The shell of males is oblong while that of females is triangular. Males can grow up to 2.8 inches in size while females are about 1.8 inches. The snuffbox is usually found in small- to medium-sized creeks with swift currents although they are sometimes found in larger rivers as well. Adults burrow in sand, gravel, or cobble substrates. Snuffbox mussels are suspension feeders, typically feeding on algae, bacteria, detritus, microscopic animals, and dissolved organic material (FWS, 2012b). The snuffbox is listed as potentially occurring in Doddridge, Marshall, Tyler, and Wetzel Counties, West Virginia; and Livingston and Washtenaw Counties, Michigan.

It is not known whether the snuffbox is present in the Rover Project area in West Virginia, therefore the WVDNR recommended mussel surveys in Wheeling Creek (MP MJL 2.6 in Marshall County), Middle Island Creek (MPs SWL 13.2 and SWL 23.9), and Sancho Creek (MP SWL 18.3 in Tyler County) (WVDNR, 2014). Per the OEPC, the Rover Project would be within 0.25 mile of Meathouse Fork, Middle Island Creek, and the Ohio River (MP SWL 34.4) in Doddridge and Tyler counties, West Virginia, which provide habitat for the snuffbox. In August 2015, Rover conducted surveys of Wheeling and Sancho Creeks. Meathouse Creek is not crossed by the Project, and Rover is proposing to cross Middle Island Creek and Ohio River crossings via HDD. Surveys in Wheeling Creek and Sancho Creek did not identify the presence of snuffbox within the survey area.

The MINFI review noted that the snuffbox has been recorded in the Portage River, which would be crossed at MP MS 84.7. The Portage River would be crossed using an HDD. This species is also known to occur in the Huron River in Michigan. The Huron River is approximately 2.5 miles east of MP MS 79.0 in Washtenaw County, Michigan. We conclude that the Rover Project *may affect, but is not likely to adversely affect* the snuffbox mussel.

Fanshell Mussel

The fanshell is a federally endangered freshwater mussel. This species has a roundish shell and is light green to yellow with green rays in color. The fanshell is found in medium to large rivers where it buries itself in sand or gravel in deep water of moderate current. It is a suspension feeder, consuming microscopic organisms by filtering them out of the water column. Reproduction of fanshells requires a stable, undisturbed habitat and sufficient population of fish hosts to complete the larval development stage (FWS, 1997c).

Per the OEPC, the Rover Project would be within 0.25 mile of Meathouse Fork, Middle Island Creek, and the Ohio River in Doddridge and Tyler counties, West Virginia, which provide habitat for the fanshell. The Sherwood Lateral would cross Middle Island Creek at MPs SWL 13.2 and SWL 23.9, and the Ohio River at MP SWL 34.4 in Tyler County. Meathouse Creek is about 1.6 miles west of the proposed Sherwood Lateral route between MPs SWL 0.0 and SWL 1.0, but is not crossed by the Rover Project. All three waterbody crossings noted above would be crossed via HDD. We conclude that the Rover Project *may affect, but is not likely to adversely affect* the fanshell.

Pink Mucket

The pink mucket is a federally listed endangered freshwater mussel. The male is oval in shape shell and the female more spherical. Each gender can grow up to 4.25 inches in size. The pink mucket is found in mud and sand and in shallow riffles and shoals of major rivers and tributaries. The mussel buries itself in sand or gravel and feeds by siphoning microscopic organisms and plant material out of the water column (FWS, 1997d).

Per the OEPC, the Rover Project would be within 0.25 mile of Meathouse Fork, Middle Island Creek, and the Ohio River in Doddridge and Tyler counties, West Virginia, which provide habitat for the pink mucket. The Sherwood Lateral would cross Middle Island Creek at MPs SWL 13.2 and SWL 23.9, and the Ohio River at MP SWL 34.4 in Tyler County. Meathouse Creek is about 1.6 miles west of the proposed Sherwood Lateral route between MPs SWL 0.0 and SWL 1.0, but is not crossed by the Rover Project. Rover is proposing to cross all three waterbodies via HDD. We conclude that the Rover Project *may affect, but is not likely to adversely affect* the pink mucket.

Sheepnose Mussel

The sheepnose is a federally listed endangered, medium-sized mussel that grows to approximately 5 inches in size. The shell is smooth, round in shape, slightly inflated, and ranges from light yellow to a yellowish-brown in color with dark concentric rings. Sheepnose mussels inhabit large rivers and streams where they are usually found in shallow areas with moderate to swift currents that flow over coarse sand and gravel. They are also sometimes found in muddy areas or areas with cobble and boulders. Adult sheepnose are suspension feeders and siphon microscopic organisms and plant material from the water column (FWS, 2012c).

Per the OEPC, the Rover Project would be within 0.25 mile of Meathouse Fork, Middle Island Creek, and the Ohio River in Doddridge and Tyler counties, West Virginia, which provide habitat for the sheepnose. The Sherwood Lateral would cross Middle Island Creek at MPs SWL 13.2 and SWL 23.9, and the Ohio River at MP SWL 34.4 in Tyler County. Meathouse Creek is about 1.6 miles west of the proposed Sherwood Lateral route between MPs SWL 0.0 and SWL 1.0, but is not crossed by the Rover Project. Rover is proposing to cross all three waterbodies listed above via HDD. We conclude that the Rover Project *may affect, but is not likely to adversely affect* the sheepnose mussel.

Overall, Rover has identified several potential strategies that could be employed to minimize impacts on mussel species. The primary measure is to complete stream crossings that may contain federally listed mussels by HDD. Using HDD would avoid direct impacts on mussels. However, the potential exists for impacts on aquatic species due to frac-outs during HDD drilling operations and from hydrostatic testing of the completed HDD pipeline segment.

Frac-outs are typically associated with shallow bores in unconsolidated substrate (e.g., loose cobble). We reviewed the HDD plans for the five proposed HDD crossings associated with federally listed species and agree that the plans have been designed to minimize impacts on surface water resources. Specifically, these HDDs would be between 40 and 100 feet below the waterbody with a semi-impermeable layer of substrate or confining layer between the HDD and the waterbody (e.g., bedrock, clay). In the event that a frac-out did occur along the HDD route, it is unlikely that it would be to mussel habitat as these waterbodies constitute less than 5 percent of these HDD lengths, with the exception of the Ohio River crossing (see table 4.1.1-3). For the Ohio River, it is not anticipated that the large majority of the waterbody crossing provides quality habitat for these federally listed mussels as most of these species prefer shallow habitat with swifter currents in smaller streams. Construction of the HDD crossings would follow the guidance prescribed in Rover's HDD Contingency Plan which outlines procedures for monitoring drilling, the drill path, and waterbodies, as well as procedures for identifying inadvertent releases, notifying relevant agencies, and corrective actions in the unlikely event a frac-out occurs (see appendix G). Overall, the design of the HDDs as well as Rover's adherence to its HDD Contingency Plan would minimize the potential for adverse impacts on aquatic organisms, including listed mussel species.

As discussed in section 4.3.2, potential impacts of hydrostatic testing on aquatic organisms would be minimized by maintaining base flows in the source waterbody, limiting the number of water sources used by transferring test water between pipeline segments, not using chemicals in the test water, and discharging the test water in well-vegetated upland areas at a rate that avoids potential erosion.

Insects

Mitchell's Satyr Butterfly

The Mitchell's satyr butterfly is a federally listed endangered species. This is a medium-sized butterfly with a wingspan of approximately 1.75 inches. The wings are brown and the lower surface of both wings features a distinctive series of orange-ringed black circular eyespots with silvery centers. The

Mitchell's satyr is one of the most geographically restricted eastern butterflies. Little is known about the butterfly's three life stages, but the adults only live for 2 weeks. The Mitchell's satyr inhabits fens which are low nutrient wetlands that receive carbonate-rich groundwater from springs and seeps (FWS, 1999). The Mitchell's satyr populations appear to function as sedentary units, with little to no ability to colonize unoccupied suitable habitat (FWS, 1992, 1999). The Mitchell's satyr is listed as potentially occurring in Washtenaw County, Michigan; however, the MINFI did not identify any specific locations for this species along the Market Segment (MINFI, 2014).

Mitchell's satyr butterfly is considered to be present at 16 sites in Michigan, including a site located in Washtenaw County (FWS, 2014g). This site, the Mill Creek East Fen, is about 2.9 miles west of the Market Segment alignment. Based on consultations with the FWS, the Mitchell's satyr butterfly was not a species of concern due to the lack of proximity to extant populations and potentially suitable habitat crossed by the Rover Project (FWS, 2015d). Therefore, we conclude that the Rover Project *may affect, but is not likely to adversely affect* the Mitchell's Satyr Butterfly.

<u>Hine's Emerald Dragonfly</u>

The Hine's emerald dragonfly is a federally listed endangered species and is listed as endangered in Ohio. This dragonfly has brilliant emerald green eyes and a dark brown metallic green body with yellow stripes on its sides. Its body is about 2.5 inches long and it has a wingspan of 3.3 inches. Historically, this species was found in Alabama, Indiana, and Arkansas, but has likely been extirpated from these states. It is still found in Illinois, Michigan, Wisconsin, and Missouri. The Hine's emerald dragonfly lives in calcareous spring-fed marshes and sedge meadows overlaying dolomite bedrock. Males defend small breeding territories, pursuing and mating females who enter. Immature dragonflies (nymphs) live in the water for 2 to 4 years, eating smaller aquatic insects and shedding their skins many times. The nymph finally emerges after its final shed and becomes an adult. Adults may only live 4 to 5 weeks. The greatest threat to this species is habitat destruction. Draining and filling of wetlands and contamination with pesticides and other pollutants affects the growth and development of young dragonflies (FWS, 2006b). The FWS recommends revegetation of disturbed areas with native, nectar-producing plant species, and milkweed endemic to the area to promote the health of honeybees and other pollinators. The Rover Project does not cross any known location for Hine's emerald dragonfly. In addition, Rover would not be filling any wetlands, and Rover intends to use seed mixes as recommended by the FWS. Therefore, we conclude that the Rover Project would have *no effect* the Hine's emerald dragonfly.

<u>Poweshiek Skipperling</u>

The Poweshiek skipperling is a small butterfly federally listed as endangered. It has dark brown upper surfaces with a yellowish area on its forewing. It inhabits wet meadows, open fens, and prairies with high quality tall grasses (FWS, 2014h). The Poweshiek skipperling potentially occurs in Lenawee and Livingston Counties, Michigan. The dispersal rate and mobility of this species is believed to be very low and estimated to be 1 mile across suitable habitat (FWS, 2014i). The nearest known population is approximately 4.5 miles from the Market Segment line in Livingston County, Michigan. Given the distance from known historic occurrences and the limited mobility of the Poweshiek skipperling, it is unlikely that the species would be present within the proposed Project work areas. Therefore, we conclude that the Rover Project *may affect, but is not likely to adversely affect* the Poweshiek skipperling.

Plants

Eastern Prairie Fringed Orchid

The eastern prairie fringed orchid is a federally listed threatened orchid that can grow up to 3 feet in height. Its flowers are clustered on a single stalk and are white in color that bloom late June to early July for 7 to 10 days. It prefers moist prairies with alkaline soils, but it is also sometimes found in peaty lake shores and somewhat open bogs (FWS, 2005). The eastern prairie fringed orchid potentially occurs in Wayne County, Ohio, and Livingston and Washtenaw Counties in Michigan (FWS, 2014e).

Rover conducted a habitat analysis for eastern prairie fringed orchid along the Project route. Historic elements of occurrence for this species in the vicinity of Project areas are known only from Wooster Township in Wayne County, Ohio. However, based on field surveys Rover does not cross any wet prairies, fens, or bogs through Wooster Township. Based on the lack of suitable habitat, we conclude that the Rover Project would have *no effect* on the prairie white fringed orchid.

4.7.3 State-listed Species

In Pennsylvania, three agencies are responsible for special status species. The PDCNR is responsible for plants, terrestrial invertebrates, natural communities, and geologic features. The PAGC is responsible for state-listed birds and mammals. The PAFBC is responsible for fish, reptiles, amphibians, and aquatic invertebrates. West Virginia does not currently have legislation pertaining to threatened, endangered, or sensitive species or sensitive habitats. In West Virginia, special status species are tracked and managed by the West Virginia Wildlife Diversity Program (WVWDP), part of the WVDNR. Species are assigned State Ranks by the West Virginia Natural Heritage Program. Species with State Ranks of S1, S2, or S3 are tracked by the Heritage Program. In Ohio, the Ohio Division of Wildlife (OHDW) has legal authority over Ohio's fish and wildlife, while the Ohio Division of Natural Areas and Preserves (OHDNAP) has authority over rare plants. In Michigan, the MIDNR is responsible for special status plant and animal species. Rover has been coordinating with these agencies to ensure that state regulations and permitting are appropriately addressed as part of each state's review of the Rover Project.

Fifty-eight species that are state-listed as threatened, endangered, or of special concern have been identified as potentially present in the Rover Project area (see table 4.7.3-1). Seventeen of these species are also federally listed or proposed for federal listing; one additional species is being considered for federal candidate status. These 18 species are discussed in section 4.7.2. Each of the remaining species are discussed below.

TABLE 4.7.3-1

State-listed Species Potentially Occurring in the Rover Pipeline Project Area

Common Name	Scientific Name	Federal Status	State Status	Determination of Effect
Mammals				
Indiana bat	*Myotis sodalis*	E	PA-E; MI-E, OH-E, WV-S1	See section 4.7.2
Northern long-eared bat (aka Northern myotis)	*Myotis septentrionalis*	T	PA-CR, OH-T	See section 4.7.2
Virginia big-eared bat	*Corynorhinus townsendii virginianus*	E	WV-S2	See section 4.7.2
Black bear	*Ursa americanus*		OH-E	Would Not Significantly Impact
Birds				
Barn owl	*Tyto alba*		OH-T	Would Not Significantly Impact
Upland sandpiper	*Bartramia longicauda*		OH-E	Would Not Significantly Impact
American bittern	*Botarus lentiginosus*		OH-E	Would Not Significantly Impact
Northern harrier	*Circus cyaneus*		OH-E	Would Not Significantly Impact
Sandhill crane	*Grus Canadensis*		OH-E	Would Not Significantly Impact
Trumpeter swan	*Cygnus buccinators*		OH-E	Would Not Significantly Impact
Lark sparrow	*Chondestes grammacus*		OH-E	Would Not Significantly Impact
Reptiles				
Spotted turtle	*Clemmys guttata*		OH-T, MI-T	Would Not Significantly Impact
Eastern massasauga rattlesnake	*Sistrurus catenatus*	PT	OH-E, MI-SC	See section 4.7.2
Copperbelly water snake	*Nerodia erythrogaster neglecta*	T	OH-E	No Effect
Blanding's turtle	*Emydoidea blandingii*		OH-T, MI-SC	Would Not Significantly Impact
Amphibians				
Eastern hellbender	*Cryptobranchus alleganiensis*	Under evaluation for Federal Candidate status	OH-E	See section 4.7.2
Eastern spadefoot toad	*Scaphiopus holbrookii*		OH-E	Would Not Significantly Impact
Blue-spotted salamander	*Ambystoma laterale*		OH-E	Would Not Significantly Impact
Fish				
Western banded killifish	*Fundulus diaphanous menna*		OH-E	Would Not Significantly Impact

TABLE 4.7.3-1 (continued)

State-listed Species Potentially Occurring in the Rover Pipeline Project Area

Common Name	Scientific Name	Federal Status	State Status	Determination of Effect
Greater redhorse	*Moxostoma valenciennesi*		OH-T	Would Not Significantly Impact
Channel darter	*Percina copelandi*		OH-T	Would Not Significantly Impact
Pugnose minnow	*Opsopoedus emiliae*		OH-E	Would Not Significantly Impact
Iowa darter	*Etheostoma exile*		OH-E	Would Not Significantly Impact
Mountain brook lamprey	*Ichthyomyzon greeleyi*		OH-E	Would Not Significantly Impact
Northern madtom	*Noturus stigmosus*		OH-E	Would Not Significantly Impact
Mountain madtom	*Noturus eleuterus*		OH-T	Would Not Significantly Impact
Lake chubsucker	*Erimyson sucetta*		OH-T	Would Not Significantly Impact
Bigmouth shiner	*Notropis doralis*		OH-T	Would Not Significantly Impact
Silver shiner	*Notropis photogenis*		MI-T	Would Not Significantly Impact
Mussels <u>a</u>				
Clubshell	*Pleutobema clava*	E	OH-E, WV-S1	See section 4.7.2
Northern riffleshell	*Epioblasma torulosa rangiana*	E	OH-E, MI-E	See section 4.7.2
Rayed bean	*Villosa fabalis*	E	OH-E, MI-E	See section 4.7.2
White cat’s paw pearly mussel	*Epioblasma obliquata perobliqua*	E	OH-E	See section 4.7.2
Eastern pondmussel	*Ligumia nasuta*		OH-E	Would Not Significantly Impact
Purple lilliput	*Toxolasma lividus*		OH-E	Would Not Significantly Impact
Threehorn wartyback	*Obliquaria reflexa*		OH-T	Would Not Significantly Impact
Black sandshell	*Ligumia recta*		OH-T	Would Not Significantly Impact
Purple wartyback	*Cycloaias tuberculata*		MI-T	Would Not Significantly Impact
Hickorynut	*Obovaria olivaria*		MI-T	Would Not Significantly Impact
Snuffbox	*Epioblasma triquetra*	E	MI-E, WV-S2	See section 4.7.2
Fanshell	*Cyprogenia stegaria*	E	WV-S1	See section 4.7.2
Pink mucket	*Lampsilis abrupta*	E	WV-S1	See section 4.7.2
Sheepnose	*Plethobasus cyphyus*	E	WV-S1	See section 4.7.2
Wavyrayed lampmussel	*Lampsilis fasciola*		MI-T	Would Not Significantly Impact

TABLE 4.7.3-1 (continued)

State-listed Species Potentially Occurring in the Rover Pipeline Project Area

Common Name	Scientific Name	Federal Status	State Status	Determination of Effect
Insects				
Plains clubtail	*Gomphus externus*		OH-E	Would Not Significantly Impact
Purplish copper	*Lycaena helloides*		OH-E	Would Not Significantly Impact
Karner blue	*Lycaeides Melissa samuelis*		OH-E	Would Not Significantly Impact
Canada darner	*Aeshna canadensis*		OH-E	Would Not Significantly Impact
Hine's emerald dragonfly	*Somatochlora hineana*	E	OH-E	See section 4.7.2
Seepage dancer	*Argia bipunctulata*		OH-E	Would Not Significantly Impact
Brush-tipped emerald dragonfly	*Somatochlora walshii*		OH-E	Would Not Significantly Impact
Mitchell's satyr butterfly	*Neonympha mitchellii*	E	OH-E, MI-E	See section 4.7.2
Poweshiek skipperling	*Oarisma poweshiek*	E	MI-T	See section 4.7.2
Plants				
Stalked bulrush	*Scirpus pedicellatus*		PA-T	Would Not Significantly Impact
Heartleaf meehania	*Meehania cordata*		PA-E	Would Not Significantly Impact
Snow trillium	*Trillium nivale*		PA-R	Would Not Significantly Impact
Eastern prairie fringed orchid	*Platanthera eucophaea*	E	OH-T, MI-E	See section 4.7.2

Sources:

Federal: FWS, 2014e, 2014f, 2014g

State: Thompson, 1997; OHDW, 2015; MINFI, 2015; PANHP, 2015; PADCNR, 2015b; PAFBC, 2015a; WVDNR, 2015b

a Snuffbox and pink mucket are listed as endangered in Pennsylvania; however, the PAFBC determined that the portions of the Rover Project that would be located in Pennsylvania would not affect streams known to contain these mussel populations (PAFBC, 2015b).

CR = Pennsylvania candidate rare
E = endangered
PT = proposed threatened
R = rare
S1 = West Virginia critically imperiled
S2 = West Virginia imperiled
SC = special concern
T = threatened

Mammals

No exclusively state-listed mammal species have been identified as potentially occurring within the Rover Project area in Michigan, Pennsylvania, or West Virginia (MINFI, 2014; PAGC, 2014; WVDNR, 2014).

The black bear is listed as endangered in the state of Ohio and is the only exclusively state-listed mammal that could potentially occur within the Rover Project area. Most black bears have black or very dark brown fur. Black bears are solitary animals during most of the year, although females are often accompanied by cubs or yearlings. Black bears shift activity patterns seasonally in response to availability of food. Black bears are omnivorous and opportunistic, feeding on both plant and animal matter. In early spring, bears frequently feed on wetland plants. In summer, fruits and berries become important foods. Bears feed heavily in the fall in preparation for winter. The majority of animal matter consumed by bears includes insects and insect larvae; however, they will opportunistically feed on small- and medium-sized animals, including squirrels, woodchucks, beaver, amphibians, and reptiles. Bears also opportunistically feed on agricultural crops, bird feed, and garbage (MIDNR, 2015c).

The black bear is a large mobile species that would avoid areas being disturbed by construction and operation of the Rover Project (OHDNR, 2014). However, trash and debris within the construction workspace could encourage bears to move into areas where humans are working, resulting in bear human interactions. These interactions can be avoided by construction crews removing trash from construction areas daily. Currently, Rover's CMPs do not detail how trash and other debris would be handled day to day. Therefore, to minimize the potential for human/wildlife interactions, **we recommend that:**

- **<u>Prior to construction</u>, Rover should confirm that it will incorporate into its construction plans requirements that worksites be maintained in a neat and orderly manner, with all personal trash items disposed of properly; and that construction debris be removed from all work areas in a timely manner, and disposed of in a state-approved off site location by the end of each work day.**

Based on our recommendation above, we conclude that the Rover Project's impact on the black bear would be temporary and minor.

Birds

No state-listed bird species have been identified as potentially occurring within the Rover Project area in Michigan, Pennsylvania, or West Virginia (MINFI, 2014; PAGC, 2014; WVDNR, 2014). Ohio state-listed birds may occur in the Rover Project area (see table 4.7.3-1). The OHDNR Natural Heritage Database has occurrence records within 1 mile of the proposed pipeline for the barn owl, upland sandpiper, northern harrier, sandhill crane, trumpeter swan, and lark sparrow (OHDNR, 2014).

The barn owl is listed as threatened in Ohio. Barn owls depend on open grasslands to hunt meadow voles, which are their main prey. Barn owls nest in barns, silos, and other old and abandoned structures. The OHDNR recommended that impacts on these structures should be avoided to avoid impacts on this species (OHDNR, 2014). Based on Rover's application, a total of seven barns would be within the Project workspace in Ohio and would be removed and the landowner compensated. Since no surveys of these areas were provided by Rover, **we recommend that:**

- **<u>Prior to removing barns or other structures that represent potential barn owl habitat</u>, Rover should evaluate and assess each barn or similar structure for the presence of barn owls. Rover should file with the Secretary the results of the surveys and identify any additional mitigation measures developed in consultation with the OHDNR, for review and written approval of the Director of OEP.**

The upland sandpiper is an Ohio state endangered bird. Nesting upland sandpipers utilize dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and grasslands established through the Conservation Reserve Program (CRP). These habitats may occur within the Project area. OHDNR requested that construction be avoided in this habitat during the species' nesting period of April 15 to July 31 (OHDNR, 2014). While Rover would need to complete state agency coordination, we conclude that impacts from the Project would be temporary and minor for the upland sandpiper for the purpose of this EIS.

The American bittern is an Ohio state endangered bird. Bitterns nest in large undisturbed wetlands with scattered small pools and dense vegetation. Bitterns occasionally occupy bogs, large wet meadows, and dense shrubby swamps. These habitats could exist within the Rover Project area. OHDNR recommends construction be avoided in this habitat during the nesting period of May 1 to July 31 (OHDNR, 2014). While Rover would need to complete state agency coordination, we conclude that impacts on the American bittern would be temporary and minor.

The northern harrier is an Ohio state endangered bird and common migrant and winter species. Northern harriers rarely nest in the area, but occasionally breed in large marshes and grasslands. OHDNR recommends construction in this habitat be avoided during the nesting period of May 15 to August 1 (OHDNR, 2014). While Rover would need to complete state agency coordination, we conclude that impacts from the Project would be temporary and minor for the northern harrier.

The sandhill crane is an Ohio state endangered species. Sandhill cranes depend on large tracts of wet meadow, shallow marsh, or bog wetlands for breeding and nesting. In the winter, sandhill cranes will utilize agricultural fields; however, they roost in shallow, standing water or moist bottomlands. OHDNR (2014) recommends construction be avoided in this habitat during the species' nesting period of April 1 to September 1. While Rover would need to complete state agency coordination, we conclude that impacts from the Project would be temporary and minor for the sandhill crane.

The trumpeter swan is an Ohio state endangered bird. Trumpeter swans inhabit large, shallow marshes and lakes ranging in size from 40 to 150 acres with a diverse mix of plenty of emergent and submergent vegetation and open water. OHDNR (2014) recommends that construction should be avoided in this habitat during the species' nesting period of April 15 to June 15. While Rover would need to complete state agency coordination, we conclude that impacts from the Project would be temporary and minor for the trumpeter swan.

The lark sparrow is an Ohio state endangered bird. Lark sparrows are summer residents of Ohio and normally migrate shortly after their young fledge. The lark sparrow nests in grassland habitats with scattered shrub layers, in disturbed open areas, and even on patches of bare soil. This type of habitat is likely present in the Rover Project area. OHDNR (2014) recommends that construction be avoided in this habitat during the species' nesting period of May 1 to June 30. While Rover would need to complete state agency coordination, we conclude that impacts from the Project would be temporary and minor for the lark sparrow.

Reptiles and Amphibians

No state special-status reptile or amphibian species are expected to occur within Pennsylvania or West Virginia (PAFBC, 2014; WVDNR, 2014). Ohio and Michigan state-listed reptiles and amphibians may occur in the Rover Project area (see table 4.7.3-1). Federally listed reptile and amphibian species (e.g., eastern massasauga rattlesnake and copperbelly water snake) are discussed in section 4.7.2 above.

The OHDNR Natural Heritage Database has occurrence records within 1 mile of the proposed pipeline for the spotted turtle, a state threatened species (OHDNR, 2014). Much of the pipeline route is within the range of the spotted turtle. Spotted turtles prefer fens, bogs, and marshes but may also inhabit wet prairies, meadows, pond edges, wet woodlands, and shallow, slow-moving streams or ditches. The OHDNR recommends that the habitat suitability survey be conducted by an approved herpetologist. If suitable habitat is found, the OHDNR recommends that a presence/absence survey be conducted. The results of all surveys would be submitted to OHDNR. The spotted turtle has also been known to occur within the Rover Project area in Michigan (MINFI, 2014). MINFI recommends that wetland fill activity not take place during the hibernation period (mid-October through late March) since the turtles would be unable to avoid the activity. A desktop analysis and field assessments for spotted turtle habitat in Ohio was conducted in August 2015. Two locations on Mainlines A and B at MPs MAB 62.8 and MAB 65.6 were identified for presence/absence surveys in spring/summer 2016 (field survey results are not yet available). While Rover would need to complete state agency coordination, we conclude that impacts from the Project would be temporary and minor for the spotted turtle for the purposes of this EIS.

The proposed pipeline route is within the range of the Blanding's turtle, a state threatened species in Ohio (OHDNR, 2014). The Blanding's turtle is a species of special concern in Michigan and has been recorded near the Rover Project route (MINFI, 2014). Blanding's turtles inhabit marshes, ponds, lakes, streams, wet meadows, and swampy forests but are also found in dry areas while moving from one wetland to another. A desktop analysis and field assessment for Blanding's turtle habitat in Ohio was conducted in September 2015. One location at MP MS 21.7, Old Bean Creek, contained secondary habitat which may provide migratory or hibernation habitat. We conclude that impacts from the Rover Project would be temporary and minor for the Blanding's turtle.

The proposed pipeline route is within the range of the eastern spadefoot toad, listed by Ohio as endangered (OHDNR, 2014). The eastern spadefoot toad is found in areas that provide burrowing and breeding habitat. Burrowing habitat consists of sandy soils that are associated with river valleys. Breeding habitats may include flooded agricultural fields or other water holding depressions. The OHDNR recommended that a habitat suitability survey be conducted to determine if suitable eastern spadefoot toad habitat is present along the Rover Project route. A desktop analysis and field assessments for eastern spadefoot toad habitat in Ohio was conducted in August 2015. Five locations on Mainlines A and B at MPs MAB 37, MAB 36.7, MAB 36.0, MAB 28.1, and MAB 24.2 contained high quality habitat for eastern spadefoot toad and warranted presence/absence surveys to be conducted in spring/summer 2016 (field survey results are not yet available). While Rover would need to complete state agency coordination, we conclude that impacts from the Project would be temporary and minor for the eastern spadefoot toad.

The proposed pipeline route would be within the range of the blue-spotted salamander, an Ohio state endangered species. The OHDNR concluded that due to the specific location of the Rover Project, impacts on blue-spotted salamanders are not likely and therefore the Project would not impact the spotted salamander (OHDNR, 2014).

Fish

No special-status fish species are expected to occur within the Pennsylvania or West Virginia Project areas (PAGC, 2014; WVDNR, 2014). Ohio and Michigan state-listed fish may be present in the Rover Project area (see table 4.7.3-1). The OHDNR Natural Heritage Database has records within 1 mile of the proposed pipeline route in Ohio for the western banded killifish, greater redhorse, and channel darter. In addition, the pipeline route would be within the range of the pugnose minnow, Iowa darter, mountain brook lamprey, Northern madtom, mountain madtom, lake chubsucker, and bigmouth shiner (OHDNR, 2014). The silver shiner is state endangered in Michigan and has been observed in the River Raisin (MINFI, 2014). While Rover would need to complete state agency coordination, we conclude that impacts from the Project would be temporary and minor for these species.

Mussels

Mussels live in a variety of aquatic habitats, but all require areas of running water with high oxygen content and a rich source of organic particulates and microorganisms. Threats to freshwater mussels include excess sedimentation (which covers their siphons and suffocates them), water pollution, physical barriers such as dams, and disturbances such as dredging (WVDNR, 2003). The PAFBC determined that the portion of the Rover Project in Pennsylvania would not affect streams known to contain protected mussel populations and, therefore no surveys are required (PAFBC, 2015b). Mussel species within the Rover Project area in West Virginia, Ohio, and Michigan, are listed above in table 4.7.3-1. All sensitive mussel species in the Rover Project area in Ohio and Michigan are listed as threatened, imperiled, endangered, or critically imperiled by their respective state agencies (OHDNR, 2014; MINFI, 2014; WVDNR, 2014). Federally listed mussel species (e.g., clubshell, northern riffleshell, rayed bean, white cat's paw pearly mussel, snuffbox, fanshell, pink mucket, and sheepnose) are discussed in section 4.7.2 above.

All Ohio streams within the Rover Project area may provide suitable habitat for one or more species of freshwater mussels. The OHDNR Natural Heritage Database has occurrence records within 1 mile of the proposed pipeline for the clubshell (OHDNR, 2014). In addition to federally listed species, the proposed pipeline route is within range of the eastern pondmussel, purple Lilliput, threehorn wartyback, and the black sandshell (OHDNR, 2014). Freshwater mussel surveys in Ohio were conducted in July-August 2015 in accordance with the *Ohio Mussel Survey Protocol*.

In Michigan, the wavy rayed lampmussel has been known to occur in Iron Creek, the River Raisin, and Portage River (MINFI, 2014). It occurs in and near riffles in small to medium sized rivers with good current and sand or gravel substrates. Wavy rayed lampmussels are from the Unionidae family, which have a unique lifecycle. Unionid mussels require a fish host to complete its lifecycle. The smallmouth bass is the only known fish host of the wavyrayed lampmussel. The purple wartyback has also been observed in the River Raisin (MINFI, 2014). It inhabits medium to large rivers that with sand and gravel bottoms. Known hosts for the purple wartyback include the yellow bullhead and channel catfish. The snuffbox has been known to occur in the Portage River (MINFI, 2014). It inhabits rivers and streams with cobble, gravel, or sandy bottoms with swift currents. The slippershell has been known to occur in the Belle River (MINFI, 2014). Slippershells typically inhabit creeks and the headwaters of rivers in sandy or gravel substrates. Host fish in Michigan include the johnny darter and mottled sculpin. The hickorynut is a non-unionid Michigan endangered mussel that has been observed in the River Raisin and inhabits medium sized streams with moderate flow (MINFI, 2014).

All West Virginia freshwater mussel species are tracked and managed by the WVDNR. The WVDNR has identified several proposed water crossings that may affect mussels and recommended surveys, unless the HDD method is utilized to avoid impacts. As each of the species identified by WVDNR is federally listed, potential impacts are discussed above in section 4.7.2.

Rover conducted desktop assessments and field reconnaissance surveys by a qualified malacologist in order to determine waterbodies that potentially contained state-listed mussels. Rover conducted in-stream freshwater mussel surveys in waterbodies identified as potential habitat for state-listed mussels in July-August 2015. No state-listed mussels were collected during sampling events. Therefore, we conclude that the Rover Project would not impact state-listed mussels.

Insects

No special-status insect species are expected to occur within Pennsylvania or West Virginia (PADCNR, 2015b; WVDNR, 2014). Federally listed insect species (e.g., Hine's emerald dragonfly, Mitchell's satyr butterfly, and Poweshiek skipperling) are discussed in section 4.7.2 above. Ohio and

Michigan state-listed insects may occur in the Rover Project area (see table 4.7.3-1). The proposed pipeline route is within the range of the plains clubtail, an Ohio state endangered dragonfly that inhabits medium to large size streams with sand and gravel substrates (OHDNR, 2014). The proposed pipeline route is also within the range of several other Ohio state-listed dragonflies, including the Canada darner, seepage dancer, and brush-tipped emerald. OHDNR has recommended that impacts on wetlands that provide habitat for these species should be avoided and/or minimized to the fullest extent possible (OHDNR, 2014). While Rover would need to complete state agency coordination, we conclude that impacts from the Rover Project would be temporary and minor for state-listed dragonfly species.

The proposed pipeline route is within the range of Ohio state-listed butterflies, including the purplish copper and the Karner blue. Due to the location, and the type of work proposed, we do not anticipate impacts on the purplish coppers or Karner blues butterfly species (OHDNR, 2014).

Plants

State-listed plants that may be found in the Rover Project area in Pennsylvania are listed in table 4.7.3-1. No exclusively state-listed special-status plant species are expected to occur within Project areas of Ohio, Michigan, or West Virginia (OHDNR, 2014; MINFI, 2014; WVDNR, 2014). The one federally listed species (prairie white fringed orchid) is discussed in section 4.7.2 above.

The PADCNR identified three plant species that may exist in the Rover Project vicinity (PADCNR, 2014). Heartleaf meehania is found along rocky stream sides in forest floodplains and flowers from May to July. Stalked bulrush occurs in boggy swamps along streams and prefers lowland alluvial wetlands and stream valleys. Stalked bulrush fruits in July. Snow trillium has been documented on a lower slope in a rich maple-hemlock stream valley. Snow trillium prefers wooded stream valleys, often on limestone soils, and flowers from late March through April (PADCNR, 2014).

The PADCNR requested a survey be conducted to determine the presence or absence of these species within the portion of the Burgettstown Lateral located within Pennsylvania. Snow trillium surveys were completed in Pennsylvania in early April 2015 on tracts where landowner permission was available. No snow trillium were found. Rover conducted plant surveys in compliance with state protocols for stalked bulrush and heartleaf meehania in July 2015 with no individuals of these species being identified during the surveys. Therefore, we conclude that the Rover Project would not impact state-listed plant species.

Based on the above discussion, we conclude that the Rover Project could impact certain special status state species. Defining the magnitude, intensity, and duration of impacts on special status species would depend upon the outcome of ongoing habitat surveys, special status species surveys, and avoidance, conservation and mitigation plans being completed by Rover in coordination with the appropriate state resource agencies. Therefore, **we recommend that:**

- **<u>Prior to construction</u>, Rover should continue to consult with the applicable state agencies to identify any additional mitigation measures for state-protected species and the need for additional surveys for Ohio, Michigan, West Virginia, and Pennsylvania. The results of such consultations and any outstanding surveys should be filed with the Secretary.**

4.8 LAND USE, RECREATION, SPECIAL INTEREST AREAS, AND VISUAL RESOURCES

4.8.1 Land Use

As discussed in section 2.1, Rover is proposing to construct a new natural gas pipeline of varying sizes within 510.3 miles of right-of-way across a total of 26 counties in four states (Pennsylvania, West Virginia, Ohio, and Michigan). About 25 percent of the Rover Project route would be collocated with or adjacent to existing pipeline, roadway, railway, and/or utility rights-of-way (see table 2.2.1-1). The Rover Project would also include 10 new compressor stations, 21 meter stations, 6 tie-ins, and appurtenant facilities. Panhandle is proposing to modify four existing compressor stations and conduct upgrades at three gate facilities to allow bi-direction flow of natural gas on its existing pipeline system. Similarly, Trunkline proposes to modify four existing compressor stations and reconfigure the Bourbon Meter Station to allow bi-direction flow of natural gas on its existing pipeline system. This section of the EIS discusses the land requirements for construction and operation of the Projects, the current use of those lands, and provide an evaluation of the Project-related impacts.

4.8.1.1 Environmental Setting

Seven general land use types would be affected by the Projects. Table 4.8.1-1 summarizes the acreage of each land use type that would be affected. The definitions of each land use type are as follows:

- agricultural land – actively cultivated or specialty crops and agricultural wetlands;
- industrial/commercial – manufacturing or industrial plants, paved areas, landfills, and commercial or retail facilities, and sand/gravel pits or quarries;
- open land – open fields, existing utility rights-of-way, herbaceous and scrub-shrub uplands, non-forested lands, non-paved roads, non-agricultural emergent wetlands, and scrub-shrub wetlands;
- open water – waterbody crossings greater than 100 feet and those that are visible on aerial photography that are less than 100 feet;
- forest/woodland – upland forest lands, forested wetlands, and some scrub-shrub wetlands;
- other – golf course; and
- residential – existing developed residential areas and planned residential developments. This includes large developments, residentially zoned areas that have been developed, and short segments of the route at road crossings with homes near the route alignment.

TABLE 4.8.1-1

Acreage Affected by Construction and Operation of the Proposed Projects

	Forest / Woodland b		Agricultural		Open Land c		Residential		Industrial / Commercial		Open Water		Other		Total	
Facilities	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**
ROVER PROJECT																
Pipeline Facilities a																
Berne Lateral	46.2	21.7	7.2	3.8	2.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.6	26.6
Burgettstown Lateral	522.7	203.6	258.5	87.6	47.9	17.9	1.9	1.0	0.0	0.0	1.8	1.6	1.7	0.8	834.4	312.4
Cadiz Lateral	22.7	7.9	33.3	11.1	4.2	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.1	20.6
CGT Lateral	65.9	32.9	3.8	1.6	1.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.3	35.4
Clarington Lateral	247.9	85.4	241.3	82.4	69.3	27.2	0.3	0.3	0.0	0.0	0.1	0.1	0.0	0.0	558.8	195.4
Mainlines A and B	362.6	168.1	2,804.8	1,133.8	130.4	56.7	15.0	7.8	0.0	0.0	10.7	6.2	0.0	0.0	3,323.5	1,372.6
Majorsville Lateral	203.3	108.5	39.2	19.8	21.9	10.5	0.7	0.5	0.0	0.0	1.5	1.5	0.0	0.0	266.6	140.7
Market Segment	227.4	84.4	1,381.1	447.6	73.6	26.3	14.2	5.8	0.0	0.0	0.8	0.2	5.3	2.1	1,702.4	566.4
Seneca Lateral	269.3	93.3	143.3	50.8	28.9	11.0	1.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	442.7	155.5
Sherwood Lateral	747.6	264.7	125.2	45.3	38.7	13.4	1.0	0.6	0.0	0.0	2.6	2.5	0.0	0.0	915.0	326.5
Supply Connector Lines A and B	202.1	90.2	85.2	35.5	20.9	9.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	308.7	134.9
Pipeline Facilities Subtotal	*2,917.6*	*1,160.6*	*5,122.7*	*1,919.4*	*439.8*	*175.2*	*34.6*	*16.5*	*0.0*	*0.0*	*17.5*	*12.2*	*7.0*	*2.9*	*8,539.2*	*3,286.9*
Access Roads																
Berne Lateral	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
Burgettstown Lateral	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	3.9	0.7	0.0	0.0	0.0	0.0	4.1	0.8
Cadiz Lateral	0.0	0.0	0.0	0.0	0.6	0.6	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	1.0	0.6
CGT Lateral	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	7.5	0.7	0.0	0.0	0.0	0.0	7.7	0.7

TABLE 4.8.1-1 (continued)

Acreage Affected by Construction and Operation of the Proposed Projects

	Forest / Woodland		Agricultural		Open Land		Residential		Industrial / Commercial		Open Water		Other		Total	
Facilities	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**
Clarington Lateral	0.1	0.1	0.0	0.0	1.8	1.8	0.0	0.0	16.2	2.2	0.0	0.0	0.0	0.0	18.2	4.1
Mainlines A and B	0.0	0.0	3.0	2.5	0.2	0.2	0.0	0.0	0.8	0.1	0.0	0.0	0.0	0.0	4.0	2.8
Majorsville Lateral	0.4	0.3	0.0	0.0	0.5	0.3	0.0	0.0	17.0	1.3	0.0	0.0	0.0	0.0	18.0	2.0
Market Segment	0.4	0.4	1.7	0.4	0.6	0.6	0.0	0.0	12.1	3.7	0.0	0.0	0.0	0.0	14.8	5.1
Seneca Lateral	1.3	0.4	1.1	0.0	2.6	1.4	0.0	0.0	12.2	1.2	0.0	0.0	0.0	0.0	17.2	2.9
Sherwood Lateral	2.6	0.4	0.3	0.2	2.4	0.5	0.0	0.0	34.2	6.6	0.0	0.0	0.0	0.0	39.4	7.6
Supply Connector Lines A and B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.5	0.0	0.0	0.0	0.0	1.3	0.5
Access Road Subtotal	*5.0*	*1.6*	*6.2*	*3.1*	*9.0*	*5.7*	*0.0*	*0.0*	*105.5*	*17.0*	*0.0*	*0.0*	*0.0*	*0.0*	*125.8*	*27.4*
Contractor Yards																
Ashland Yard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.3	0.0	0.0	0.0	0.0	0.0	21.3	0.0
Bucyrus Yard	0.0	0.0	0.0	0.0	66.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.8	0.0
Burgettstown Yard	0.0	0.0	0.0	0.0	200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	200.0	0.0
Clarington Yard	0.0	0.0	0.0	0.0	48.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.0	0.0
Defiance Yard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.7	0.0	0.0	0.0	0.0	0.0	23.7	0.0
Dennison Yard	0.0	0.0	0.0	0.0	61.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.6	0.0
Dover Yard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.8	0.0	0.0	0.0	0.0	0.0	21.8	0.0
Majorsville Yard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.0	0.0	0.0	0.0	0.0	0.0	39.0	0.0
Mansfield Yard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.0	0.0	0.0	0.0	0.0	0.0	23.0	0.0

TABLE 4.8.1-1 (continued)

Acreage Affected by Construction and Operation of the Proposed Projects

Facilities	Forest / Woodland Constr	Forest / Woodland Oper	Agricultural Constr	Agricultural Oper	Open Land Constr	Open Land Oper	Residential Constr	Residential Oper	Industrial / Commercial Constr	Industrial / Commercial Oper	Open Water Constr	Open Water Oper	Other Constr	Other Oper	Total Constr	Total Oper
Oakville Yard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.5	0.0	0.0	0.0	0.0	0.0	43.5	0.0
Seneca Yard	0.0	0.0	0.0	0.0	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	0.0
Sherwood Yard	0.0	0.0	0.0	0.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0	0.0
Whitmore Lake Yard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0	0.0	15.5	0.0
Contractor Yards Subtotal	*0.0*	*0.0*	*0.0*	*0.0*	*402.9*	*0.0*	*0.0*	*0.0*	*187.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*590.7*	*0.0*
Meter, Regulation, and Receipt Stations																
ANR Meter Station	0.0	0.0	7.9	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	2.2
Berne Meter Station	0.0	0.0	6.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	1.0
CGT Meter Station	0.1	0.0	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.8
Clarington A Meter Station	1.2	0.2	4.2	2.7	0.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	3.4
Consumers Energy Meter Station	0.0	0.0	4.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.1
Gulfport Meter Station	6.6	0.4	3.5	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	0.4
Madison Meter Station	0.2	0.0	5.4	0.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.6
Majorsville Launcher	1.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.3
Majorsville Meter Station	1.5	0.4	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.5
Vector Meter Station	0.0	0.0	11.5	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.5	1.8
Meter Station Subtotal	*10.6*	*1.3*	*44.1*	*9.1*	*4.6*	*0.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*59.4*	*10.9*

TABLE 4.8.1-1 (continued)

Acreage Affected by Construction and Operation of the Proposed Projects

	Forest / Woodland		Agricultural		Open Land		Residential		Industrial / Commercial		Open Water		Other		Total	
Facilities	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**
Tie-In Facilities																
Cadiz Tie-In	4.5	1.9	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	2.3
CGT Tie-In	0.0	0.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.3
Mainline B Receiver	0.0	0.0	1.0	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.0
Majorsville Tie-In	1.8	0.5	0.3	0.0	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.7
REX Interconnect Pipeline/Tie-In	1.8	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.2
Sherwood Tie-In	0.0	0.0	2.7	0.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.5
Tie-In Subtotal	*8.1*	*3.6*	*5.9*	*2.1*	*1.2*	*0.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*15.2*	*6.0*
Compressor Station																
Burgettstown Compressor Station	13.9	4.8	0.0	0.0	3.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.8	5.4
Cadiz Compressor Station	0.0	0.0	20.1	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.1	7.8
Clarington Compressor Station	15.1	1.4	16.2	3.1	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.1	4.6
Defiance Compressor Station	0.0	0.0	22.1	20.5	2.4	0.5	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	25.5	21.7
Mainline Compressor Station 1	2.6	0.0	31.6	11.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.0	11.1
Mainline Compressor Station 2	0.9	0.2	21.6	11.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.7	11.6

TABLE 4.8.1-1 (continued)

Acreage Affected by Construction and Operation of the Proposed Projects

Facilities	Forest / Woodland Constr	Forest / Woodland Oper	Agricultural Constr	Agricultural Oper	Open Land Constr	Open Land Oper	Residential Constr	Residential Oper	Industrial / Commercial Constr	Industrial / Commercial Oper	Open Water Constr	Open Water Oper	Other Constr	Other Oper	Total Constr	Total Oper
Mainline Compressor Station 3	0.0	0.0	31.8	12.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.8	12.3
Majorsville Compressor Station	10.8	2.3	0.0	0.0	6.2	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.0	4.3
Seneca Compressor Station	25.8	6.1	0.5	0.0	2.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.4	6.8
Sherwood Compressor Station	23.9	1.0	5.2	0.0	5.4	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.5	5.2
Compressor Station Subtotal	*93.0*	*15.8*	*149.1*	*66.2*	*25.0*	*8.2*	*0.9*	*0.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*267.9*	*90.8*
Rover Project Total	*3,034.2*	*1,182.8*	*5,328.1*	*1,999.8*	*882.5*	*189.9*	*35.5*	*17.2*	*293.3*	*17.0*	*17.5*	*12.2*	*7.0*	*2.9*	*9,598.1*	*3,421.9*
Panhandle Backhaul Project																
Edgerton 10 Gate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Edgerton Compressor Station	0.0	0.0	0.0	0.0	14.4	0.0	0.0	0.0	25.9	0.0	0.0	0.0	0.0	0.0	40.3	0.0
Montezuma Compressor Station	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	33.6	0.0	0.0	0.0	0.0	0.0	36.4	0.0
Panhandle-Rover Interconnect	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	3.4	0.0
Tuscola 6 Gate / Mainline Scrubber	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	2.3	0.0
Tuscola Compressor Station	0.0	0.0	0.0	0.0	12.5	0.0	0.0	0.0	23.7	0.0	0.0	0.0	0.0	0.0	36.2	0.0

TABLE 4.8.1-1 (continued)

Acreage Affected by Construction and Operation of the Proposed Projects

Facilities	Forest / Woodland Constr	Forest / Woodland Oper	Agricultural Constr	Agricultural Oper	Open Land Constr	Open Land Oper	Residential Constr	Residential Oper	Industrial / Commercial Constr	Industrial / Commercial Oper	Open Water Constr	Open Water Oper	Other Constr	Other Oper	Total Constr	Total Oper
Zionsville 3 Gate	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	1.7	0.0
Zionsville Compressor Station	0.0	0.0	49.0	0.0	8.9	0.0	0.0	0.0	50.2	0.0	0.0	0.0	0.0	0.0	108.1	0.0
Panhandle Backhaul Project Total	*0.0*	*0.0*	*50.6*	*0.0*	*40.6*	*0.0*	*0.0*	*0.0*	*138.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*229.4*	*0.0*
Trunkline Backhaul Project																
Bourbon Meter Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.4	0.0	0.0	0.0	0.0	0.0	14.4	0.0
Dyersburg Compressor Station	0.0	0.0	0.0	0.0	6.2	0.0	0.0	0.0	28.5	0.0	0.0	0.0	0.0	0.0	34.7	0.0
Independence Compressor Station	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	37.5	0.0	0.0	0.0	0.0	0.0	39.6	0.0
Johnsonville Compressor Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.2	0.0	0.0	0.0	0.0	0.0	38.2	0.0
Joppa Compressor Station	0.0	0.0	0.0	0.0	13.3	0.0	0.0	0.0	27.9	0.0	0.0	0.0	0.0	0.0	41.2	0.0
Panhandle - Trunkline Interconnect **d**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trunkline Project Backhaul Total	0.0	0.0	0.0	0.0	21.6	0.0	0.0	0.0	146.5	0.0	0.0	0.0	0.0	0.0	168.1	0.0
PROJECT TOTAL	**3,034.2**	**1,182.8**	**5,378.7**	**1,999.8**	**944.7**	**189.9**	**35.5**	**17.2**	**578.1**	**17.0**	**17.5**	**12.2**	**7.0**	**2.9**	**9,995.6**	**3,421.9**

TABLE 4.8.1-1 (continued)

Acreage Affected by Construction and Operation of the Proposed Projects

	Forest / Woodland		Agricultural		Open Land		Residential		Industrial / Commercial		Open Water		Other		Total	
Facilities	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**	**Constr**	**Oper**

a Pipeline Facility Acreages includes impacts from additional temporary workspaces.
b Forest / Woodland acreages include forested wetlands.
c Open land acreages include emergent and scrub shrub wetlands.
d Impact acreage for the Panhandle-Trunkline Interconnect are accounted for under the Panhandle Project’s Tuscola Compressor Station.

Construction of the Rover Project would impact a total of 9,598.1 acres. Of this acreage, 89.0 percent would be used for the pipeline facilities, including the construction right-of-way and additional temporary extra workspaces. The remaining acreage impacted during construction would be associated with contractor yards (6.2 percent), access roads (1.3 percent), and aboveground facilities (3.5 percent). Following construction, the construction right-of-way (outside of the permanent right-of-way), extra workspace areas, contractor yards, and temporary access roads would be allowed to revert to their original land use type. The primary land use types impacted during construction would be forested/woodland (31.6 percent) and agriculture (55.5 percent). Open water, wetlands, open land, industrial/commercial and residential would make up the remaining 12.9 percent of land types impacted during construction.

The Panhandle Project would impact 229.4 acres, of which 138.3 acres would be industrial, 40.6 acres would be open land, and 50.6 acres would be agricultural. The Trunkline Project would impact 168.1 acres during construction, all of which would be industrial and open land. An additional 36.2 acres would be impacted for the Panhandle-Trunkline Interconnect, all of which would be within the boundary of Panhandle's Tuscola Compressor Station.

Operation of the Rover Project would permanently encumber 3,421.9 acres. The easement along Rover's new permanent pipeline rights-of-way would account for 3,286.9 acres, or 96.1 percent of the acreage. The remaining 135.0 acres (3.9 percent) would be associated with aboveground facilities and permanent access roads. The primary land use types that would be newly encumbered on a permanent basis are forested/woodland (34.6 percent) and agriculture (58.4 percent). Open land, industrial/commercial lands, open water, residential lands, and wetlands would make up the remaining 7.0 percent of land use types associated with the permanent right-of-way, aboveground facilities, and permanent access roads. There would be no new permanent right-of-way required for the Panhandle or Trunkline Projects.

4.8.1.2 Pipeline Facilities

The Rover Project would consist of 712.9 miles of 24-, 30-, 36-, and 42-inch-diameter pipe within 510.3 miles of right-of-way. Table 4.8.1-1 and appendix O summarizes the land uses that would be crossed by these rights-of-way. Predominant land uses are agricultural land (60.0 percent), followed by forest land (34.2 percent), and open land (5.2 percent). Residences and other structures within 50 feet of the construction workspace are discussed in section 4.8.3.1. The remaining 0.6 percent of the land is comprised of residential, commercial/industrial (including roadways), and open water.

In general, land use-related impacts associated with the Rover Project would include the disturbance of existing uses within the rights-of-way during construction and new permanent rights-of-way for operation of the pipeline. The width of the construction right-of-way would vary depending on the size of the pipe to be installed, the number of pipes, and the site-specific conditions such as land cover and soil types. For the 24-inch-diameter pipe, Rover proposes to use a 100-foot-wide construction right-of-way in agricultural lands and a 75-foot-wide right-of-way in upland areas and wetlands. For the single pipe installation of the 30-inch-, 36-inch-, and 42-inch-diameter pipelines, Rover would use a 150-foot-wide right-of-way in agricultural lands, 125 feet in upland areas, 100 feet in non-forested wetlands, and 75 feet in forested wetlands. As proposed, the dual 42-inch-diameter pipelines (Mainlines A and B and the Supply Connectors A and B) would require a 150-foot-wide construction right-of-way in agricultural lands, 135 feet in upland areas, 120 feet in non-forested wetlands, and 95 feet in forested wetlands. However, in section 4.4.4, we have recommended that the construction right-of-way be reduced through these wetlands.

Rover would install and maintain a current cathodic protection system to help protect the pipeline from external corrosion. Rover has not identified the locations of these facilities or the sizes of these

Project components; any cathodic protection beds Rover would require that are outside of previously approved workspace would fall under the variance process described in section 2.5.4.

In addition to the construction rights-of-way, various extra workspaces would be used for Project construction. As discussed in section 2.2.1.3, Rover identified several areas where site-specific conditions require the use of extra workspace outside of the construction right-of-way. Appendix E lists the locations of these extra workspaces, their dimensions, area affected, justification, and other information. Based on our review, we found these requests to be acceptable.

Of the 138 locations where the Rover pipeline would be collocated with or adjacent to existing rights-of-way, Rover has identified 12 locations where the construction right-of-way would consist of a portion of the existing, cleared permanent right-of-way (see table 2.2.1-1). In the draft EIS, we recommended that Rover consult with the owners and operators of the existing rights-of-way regarding the feasibility of using portions of the existing rights-of-way during Project construction and file documentation of its consultations. Rover filed an updated table, which included information on its ongoing negotiations with owners and operators of the rights-of-way. While Rover has stated that it is continuing its discussions with the owners and operators, to date no additional agreements have been reached that would allow overlap between the existing rights-of-way and Rover's right-of-way beyond those locations already proposed.

During operation, the Rover Project would require a new 50-foot-wide permanent right-of-way for the single pipelines and 60-foot-wide permanent right-of-way for the dual pipelines. The land retained as new permanent rights-of-way would generally be allowed to revert to its former use, except for forested land as discussed below. Certain activities such as the construction of permanent structures, including houses, house additions, garages, patios, pools, or other objects not easily removable, or the planting of trees, would be prohibited within the permanent right-of-way. To facilitate pipeline inspection, operation, and maintenance, the entire permanent right-of-way in upland areas would be maintained in an herbaceous/scrub-shrub vegetated state. This maintained right-of-way would be mowed no more than once every 3 years, but a 10- or 30-foot-wide strip centered over the pipeline, the larger width being associated with locations where the dual pipelines would be installed, might be mowed annually to facilitate corrosion and other operational surveys. However, as discussed in section 4.6.1.4, annual mowing would not be allowed during bird nesting season.

Specific impacts on agricultural land, industrial/commercial, open land, and forest/woodland areas are discussed below. Impacts on residential areas and specialty crops are discussed in sections 4.8.3.1 and 4.8.5.1, respectively. Wetlands and surface waters (open water) are discussed in sections 4.4 and 4.3.2, respectively.

Rover would clear trees along the construction right-of-way. Although trees cleared within temporary construction work areas would be allowed to regenerate to pre-construction conditions following construction, impacts on forest resources in these areas would last for several years or decades. Following construction, the maintained portion of the right-of-way would be permanently converted to a non-forested condition (see section 4.5.5). Forest lands are discussed in more detail in section 4.5.

Agricultural lands affected by construction along the pipeline right-of-way primarily include active crop lands or hayfields and some agricultural wetlands. In general, agricultural lands are distributed along the entire pipeline route. The primary impacts in these areas would be short-term and occur during the growing season concurrent with construction. Farmers would experience some loss of crop production in areas directly disturbed by construction-related activities. Rover would compensate farmers for crop losses associated with construction disturbances and in accordance with individual negotiations. Farmers may have to alter sowing patterns in order to best farm areas that may have limited access due to construction activity.

In order to minimize impacts on agricultural lands, Rover has developed state-specific AIMP for Ohio and Michigan. For agricultural lands in West Virginia and Pennsylvania, Rover would follow the standard upland construction measures described in Rover's Plan. Following construction, agricultural practices within the pipeline right-of-way would be allowed to resume. Rover would restore all disturbed agricultural areas associated with construction in accordance with its state-specific AIMP (see appendix G) and its Plan. Typical mitigation measures include topsoil segregation, soil decompaction, and repair/replacement of irrigation and drainage structures damaged by construction. Agricultural lands and specialty crops are discussed in more detail in sections 4.8.4 and 4.8.5.1, respectively. Impacts on and mitigation for prime farmlands and statewide important farmlands are discussed in section 4.2.2.7.

Open lands that would be affected by the Rover Project include open fields, existing utility rights-of-way, herbaceous and scrub-shrub uplands, non-forested lands, and non-paved roads. Construction-related impacts on open land would include the removal of vegetation and disturbance of soils. Impacts on open land would be temporary to short-term and would be minimized by the implementation of Rover's Plan. Following construction, most open land uses would be able to continue. However, some activities, such as the building of new commercial or residential structures, would be prohibited on the permanent right-of-way. Road and railroad crossings are discussed in sections 2.3.2.3 and 4.9.4.

Industrial/commercial land uses could be temporarily impacted during construction of the Rover Project by increased dust from exposed soils, construction noise, and traffic congestion. Rover would minimize impacts on commercial land uses by coordinating driveway crossings with business owners to provide access across the construction right-of-way.

Rover would ensure access for emergency vehicles during road crossings by using temporary platforms across the pipeline trench as needed. Road surfaces would be restored as soon as practicable so that normal access could resume, and commercial land uses would be restored to pre-construction conditions, or as specified in landowner agreements.

4.8.1.3 Aboveground Facilities

Rover proposes to construct 10 new compressor stations: 6 along the Supply Laterals, 3 along Mainlines A and B, and 1 along the Market Segment. Rover would also construct 21 new meter stations; however, 11 of these would be within the compressor stations, resulting in no additional land use impacts. The nine meter stations that would be constructed as standalone facilities would be in the following counties: Doddridge and Marshall Counties in West Virginia, Defiance and Monroe Counties in Ohio, and Livingston and Washtenaw Counties in Michigan. Seventy-eight mainline valves, 11 pig launchers/receivers, and interconnecting pipes would also be constructed either within the boundaries of the compressor stations or within the pipeline right-of-way.

A total of 342.5 acres of land would be disturbed by construction of aboveground facilities for the Rover Project. Of this total, 107.7 acres would be permanently retained for operation and converted to industrial land. This would result in an increase in the conversion of vegetated land to impervious and gravel surfaces; however, Rover would be required to meet all applicable federal and state requirements regarding stormwater management at its aboveground facilities. Table 4.8.1-1 summarizes the land requirements and land uses for the aboveground facilities. The dominant land use that would be affected by these facilities is agricultural and forested lands.

The Burgettstown Compressor Station would be constructed at MP BGL 0.0 in Washington County, Pennsylvania. The compressor station would include additional aboveground facilities within its boundaries, including the Burgettstown Meter Station, a pig trap, and mainline valve. The facility site is comprised of forested, agricultural, and open lands. Construction of the compressor station and associated facilities would require a total of 17.8 acres of land, including 13.9 acres of forest/woodland

and 3.9 acres of open land. Once construction is complete, 5.4 acres would be required for operation of the facilities, including 4.8 acres of forested land and 0.6 acre of open land. The remaining 12.4 acres would be allowed to revert to pre-existing conditions. However, since it could take decades for forested land to revert to pre-construction conditions, this would represent a long-term impact on 9.1 acres of forested land within the temporary construction area.

The Sherwood Compressor Station would be constructed at MP SWL 0.0 in Doddridge County, West Virginia. The compressor station would include additional aboveground facilities within its boundaries, including the Sherwood Receipt Meter Station, a pig trap, and a mainline valve. The facility site is comprised of forested, agricultural, and open lands. Construction of the compressor station would require a total of 34.5 acres of land within the facility site, including 23.9 acres of forest/woodland, 5.4 acres of open land, and 5.2 acres of agricultural land. Once construction is complete, 5.2 acres would be required for operation of the facilities. The remaining 29.3 acres would be allowed to revert to pre-existing conditions; however, no agricultural activities would be allowed to resume on the property resulting in a conversion of agricultural land to open land.

The Majorsville Compressor Station would be constructed at MP MJL 1.1 in Marshall County, West Virginia. The facility site is comprised of forested and open land. Construction of the compressor station would require a total of 17.0 acres of land, including 10.8 acres of forest/woodland and 6.2 acres of open land. During operation, 4.3 acres would be permanently converted to industrial/commercial use.

The Seneca Compressor Station would be constructed at MP SEL 0.0 in Noble County, Ohio. The compressor station would include additional aboveground facilities within its boundaries, including the Seneca Receipt Meter Station, a pig trap, and mainline valve. The facility site is comprised of forested, agricultural, and open lands. Construction of the compressor station would require a total of 28.4 acres of land within the facility site, including 25.8 acres of forest/woodland, 2.1 acres of open land, and 0.5 acre of agricultural land. The operational footprint for the facilities would impact 6.8 acres. The remaining acres would be allowed to revert to pre-construction conditions.

The Clarington Compressor Station would be constructed at MP CLL 0.4 in Monroe County, Ohio. The compressor station would include additional aboveground facilities within its boundaries, including three receipt meter stations and mainline valve. The facility site is comprised of forested, agricultural, and open lands. Construction of the compressor station would require a total of 35.1 acres of land for construction, including 15.1 acres of forest/woodland, 3.9 acres of open land, and 16.2 acres of agricultural land. The operational footprint for the facilities would impact 4.6 acres. The remaining 30.6 acres would be allowed to revert to pre-construction conditions; however, no agricultural activities would be allowed to resume on the property resulting in a conversion of 13.1 acres of agricultural land to open land.

The Cadiz Compressor Station would be constructed at MP CZL 0.00 Harrison County, Ohio. The compressor station would include additional aboveground facilities within its boundaries, including two receipt meter stations, a pig trap, and mainline valve. The facility site is comprised completely of agricultural lands, impacting 20.1 acres. Approximately 7.8 acres would be permanently converted to industrial/commercial use for operation of these facilities. The remaining 12.3 acres of agricultural land would be converted to open land as no agricultural activities would be allowed to resume on the property.

The Mainline Compressor Station 1 would be constructed at MP MAB 18.77 in Carroll County, Ohio. The compressor station would include additional aboveground facilities within its boundaries, including a tie-in site, side tap and two mainline valves. The facility site is comprised of forested, agricultural, and open lands. Construction of the compressor station and associated facilities would require a total of 35.0 acres of land, including 31.6 acres of agricultural land, 2.6 acres of forest/woodland, and 0.8 acre of open land. Approximately 11.1 acres would be permanently converted to industrial/commercial use, while the remaining land would be allowed to revert to pre-construction conditions. However, 20.6 acres of agricultural land would be converted to open land, as no agricultural activities would be allowed to resume on the property.

The Mainline Compressor Station 2 would be constructed at MP MAB 78.2 in Wayne County, Ohio. The compressor station would include additional aboveground facilities within its boundaries, two pig traps, and four mainline valves. The facility site is comprised of agricultural and forested lands. Construction of the compressor station and associated facilities would require a total of 22.7 acres of land, including 0.9 acre of forested land and 21.6 acres of agricultural land. Operation of the compressor station would result in a permanent conversion of 11.4 acres of agricultural land and 0.2 acre of forest land to industrial/commercial. The remaining 10.1 acres of agricultural land would be converted to open land, as no agricultural activities would continue within the property boundary. The 0.7 acre of forested land would be allowed to revert to pre-construction conditions. However, since forested land could take decades to reach pre-construction conditions, this would result in a long-term impact to forested land.

The Mainline Compressor Station 3 would be constructed at MP MAB 127.9 in Crawford County, Ohio. The compressor station would include additional aboveground facilities within its boundaries, including two pig traps and four mainline valves. The entire facility would be sited in agricultural land, impacting 31.8 acres. Operation of the compressor station would require 12.3 acres of land, which would be converted to industrial/commercial. The remaining land would revert to open land, since no agricultural activities would resume within the property boundary.

The Defiance Compressor Station would be constructed at MP MS 0.00 in Defiance County, Ohio. The compressor station would include additional aboveground facilities within its boundaries, including the PEPL Delivery Meter Station, a pig trap, and mainline valve. The facility site is comprised of agricultural and open lands. Construction of the compressor station and associated facilities would require a total of 25.5 acres of land, including 22.1 acres of agricultural land, and 2.4 acres of open land . Operation of the compressor and meter stations would require 21.7 acres of land, which would be converted to industrial/commercial. The remaining 3.8 acres, including 1.6 acres of agricultural land, would revert to open land.

In addition to the aboveground facilities that would be constructed within the site boundaries of the compressor stations, Rover would also construct nine standalone meter stations and six tie-ins as described in section 2.1.2. During construction, these facilities would impact 74.6 acres, including 50.0 acres of agricultural land, 18.7 acres of forest land, and 5.8 acres of open land. Once construction is completed, 16.9 acres would be needed for operation and permanently converted to industrial/commercial land. The remaining 57.7 acres would be allowed to revert to pre-construction conditions.

Panhandle proposes to make modifications at four existing compressor stations, three valve sites locations, and an interconnection with the Rover Project. Construction of these modifications would occur on parcels owned or leased by the applicant and would affect 229.4 acres of land, including 138.3 acres of industrial land, 50.6 acres of agricultural land, and 40.6 acres of open land. Once construction is complete, all disturbed land would be returned to pre-construction conditions. No new permanent right-of-way would be required for the Panhandle Project.

Trunkline proposes to modify four existing compressor stations, one meter station, and construct an interconnection with the Rover Project. Construction and modifications of these facilities would occur on parcels owned or leased by the applicant and would impact 168.1 acres of industrial / open land. No new permanent right-of-way would be required for the Trunkline Project.

4.8.1.4 Contractor Yards

Rover proposes to use 13 temporary contractor yards to support construction activities. Two yards would be in West Virginia, nine yards would be in Ohio, and two would be in Michigan. These yards would temporarily affect 402.9 acres of open land and 187.7 acres of industrial/commercial land (see table 4.8.1-1). There would be no permanent impacts from contractor yards.

No contractor yards would be required for the Panhandle or Trunkline Projects; instead, these applicants would use the existing compressor station sites for equipment and materials storage during construction.

4.8.1.5 Access Roads

In addition to public roads, Rover proposes to use 53 permanent access roads and 172 temporary access roads (see table 4.8.1-2). Roads would vary in width between 6 feet and 35 feet wide with the exception of two roads which may be expanded to a width of 75 feet to allow for the construction of powerlines to two meter stations. Of the 53 permanent access roads, 30 of them would be newly constructed, 12 would be existing roads that would require expansion, and 11 would be existing roads with no plans to expand. Of the 172 temporary access roads, 12 would be newly constructed, 32 would require expansion of existing roads, and 128 would be existing roads.

The new and expanded access roads would impact 20.0 acres of mixed land use types including agricultural, open, and upland forest during construction. Following construction, the temporary roads would be restored and reseeded according to Rover's Plan. While temporary roads would be restored to pre-construction conditions, any impacts on forested land would result in a long-term impact. During operation, permanent use of access roads would encumber about 10.4 acres of land. This would result in the permanent conversion of vegetated land to industrial land (impervious and/or gravel). Impacts resulting from the creation of additional impervious surfaces due to access roads are further discussed in section 4.3.2.6. The proposed access roads are listed in appendix F and discussed further in sections 2.2.4 and 4.8.7.4.

Panhandle and Trunkline would use existing public roads to access each of the work areas during construction of the Projects.

TABLE 4.8.1-2

Access Road Summary Table

State / Road Type	Number of Access Roads			Acres of Vegetated Land Impacted a	
	Permanent	Temporary	Total	Construction	Operation
Pennsylvania					
Existing	0	1	1	0.0	0.0
New	0	0	0	0.0	0.0
Mixed **b**	0	0	0	0.0	0.0
Pennsylvania Subtotal	*0*	*1*	*1*	*0.0*	*0.0*
West Virginia					
Existing	4	44	48	0.0	0.0
New	3	3	6	1.2	0.8
Mixed **b**	2	16	18	2.8	0.6
West Virginia Subtotal	*9*	*63*	*72*	*4.0*	*1.3*
Ohio					
Existing	5	69	74	0.0	0.0
New	21	8	29	7.1	5.2
Mixed **b**	10	16	26	6.3	2.6
Ohio Subtotal	*36*	*93*	*129*	*13.4*	*7.8*
Michigan					
Existing	2	14	16	0.0	0.0
New	6	1	7	2.6	1.3
Mixed **b**	0	0	0	0.0	0.0
Michigan Subtotal	*8*	*15*	*23*	*2.6*	*1.3*
TOTALS					
Existing	*11*	*128*	*139*	*0.0*	*0.0*
New	*30*	*12*	*42*	*10.9*	*7.2*
Mixed **b**	*12*	*32*	*44*	*9.1*	*3.2*
PROJECT TOTALS	**53**	**172**	**225**	**20.0**	**10.4**

a Includes Open Land, Forest Land, and Agricultural Land.

b Access roads in the "Mixed" road type would utilize existing roads for a portion of the length and would also require new road construction.

4.8.2 Landownership and Easement Requirements

Pipeline operators must obtain easements from existing landowners to construct and operate authorized facilities, or acquire the land on which the facilities would be located. Easements can be temporary, granting the operator the use of the land during construction (e.g., extra workspaces, temporary access roads, contractor yards), or permanent, granting the operator the right to operate and maintain the facilities once constructed.

Rover would need to acquire new easements or acquire the necessary land to construct and operate the new pipeline and associated aboveground facilities. These new easements would convey both temporary (for construction) and permanent (for operation) rights-of-way to Rover.

All modifications for the Panhandle and Trunkline Projects would occur within existing rights-of-way or on lands owned or leased by the applicants. The applicants would notify landowners as required along the portion of its existing rights-of-way where modifications and upgrades would be required.

An easement agreement between a company and a landowner typically specifies compensation for losses resulting from construction, including losses of non-renewable and other resources, damages to property during construction, and restrictions on existing uses that would not be permitted on the permanent right-of-way. Compensation would be fully determined through negotiations between Rover and the landowner.

If an easement cannot be negotiated with a landowner and if the Project is approved by the Commission, Rover may use the right of eminent domain to acquire the property necessary to construct and operate its pipeline. This right would apply to all Project-related workspaces covered by an approval, including the temporary and permanent rights-of-way, aboveground facility sites, contractor yards, access roads, and extra workspaces. Rover would still be required to compensate the landowner for the right-of-way and damages incurred during construction. However, the level of compensation would be determined by a court according to federal or state law.

While pipeline operators negotiate easements from landowners for areas where pipeline facilities would be located; where aboveground facilities are located, operators typically negotiate a direct sale or purchase agreement. In its application and supplements, Rover indicated it was pursuing sales and/or purchase agreements with landowners for its aboveground facilities. As a result, Rover indicated that it had reached agreements with landowners to either purchase or lease sites for all of its compressor stations and a portion of its other aboveground facilities (e.g., meter stations and MLVs).

4.8.3 Existing Residences, Commercial and Industrial Facilities, and Planned Developments

As currently designed, 35.5 acres of residential land would be impacted by construction of the Rover Project, all of which would be associated with the installation of the pipelines. Following construction, 17.2 acres of residential land would be within the permanent pipeline rights-of-way and would be subject to restrictions on planting large trees or the placement of certain structures. The remaining 18.2 acres would not be subject to any restrictions; however, all residential lands would be restored to pre-construction conditions to the extent possible. In restoring properties, Rover would adhere to its Plan and any specific requirements identified by landowners and agreed to during negotiations. In most cases, property owners would be able to use the permanent right-of-way as they did before construction as long as the use does not conflict with Project operation and the terms of the landowner's negotiated easement agreement.

We received comments from landowners regarding the potential installation of a waterline across the permanent right-of-way. Rover has stated that construction of waterlines across the permanent right-of-way would be permitted. Installation would require the landowner or contractor to use the *One Call* system or call Rover directly. A Rover representative would work with the landowner to determine the best placement of the waterline, and would oversee construction to ensure the safety of the pipeline.

We received comments during scoping that raised concerns for trespassing and decreased privacy associated with unauthorized use of the Project rights-of-way during operations. Rover would follow measures outlined in its Plan to control use of the right-of-way from unauthorized users. Specifically, Rover would implement the following measures in forested lands to minimize access of the pipeline corridor by unauthorized vehicles in coordination with the property owner:

- posting no trespassing signs;
- installation of gates and/or fencing at potential access points;
- installation of screening, such as shallow-root trees; and/or
- strategic placement of access barriers, such as slash and timber, piping, or boulders.

We conclude these measures would be sufficient to reduce unauthorized access by vehicles. In addition to these measures, landowners could take additional steps against trespassing within the confines of state and local law.

4.8.3.1 Existing Residences; Commercial and Industrial Facilities

Appendix P lists residences and other structures within 50 feet of any proposed construction work area by milepost, and indicates the distance from the work areas. Residences within 50 feet of the construction work area experience certain effects of Project construction, such as noise, limitations on access, and other inconveniences. In general, as the distance to the construction work area increases, the impacts on residences decrease. In residential areas, the two greatest impacts associated with construction and operation of a pipeline are temporary disturbances during construction and the encumbrance of a permanent right-of-way, which would prevent the construction of permanent structures within the right-of-way, as well as certain other limitations or restrictions.

Rover's construction work area would be within 50 feet of 65 residential structures (including homes, mobile homes, and cabins). Five of these would be intersected by the pipeline centerline itself, and 20 would be within the construction work area but not crossed by the centerline. Of the five residences crossed by the centerline, Rover indicated it has purchased three and is continuing negotiations for the remaining two (one is a mobile home and the other is a hunting cabin; see section 3.4 for additional discussion).

Rover would notify local residents in advance of construction activities. Potential impacts on residences within 50 feet of the work areas would be minimized by:

- installing temporary safety fencing for at least 100 feet on either side of the residence and maintaining it while the trench is open;
- preserving as many trees and as much landscaping as possible;
- segregating topsoil where appropriate or as negotiated with landowner;
- maintaining utility service during construction activities;
- constructing only during daylight hours, except where special conditions dictate; and
- restoring lawn areas and landscaping immediately after backfill.

Rover prepared site-specific plans for all residential buildings currently identified as within 50 feet of construction work areas. The site-specific plans are presented in appendix Q for landowners to review. Four of the residences listed in appendix Q, while not within the construction workspace, would be within 10 feet of the workspace due to the construction constraints along those portions of the Rover Project route. Because of the increased potential for construction of the Rover Project to disrupt these residences and to ensure that property owners have adequate input to a construction activity occurring so close to their homes, **we recommend that:**

- **<u>Prior to construction</u>, Rover should file with the Secretary, for the review and written approval of the Director of OEP, evidence of landowner concurrence with the site-specific residential construction plans for all locations where construction work areas would be within 10 feet of a residence (including residences within the construction workspace).**

The driveways of several residences would be partially or wholly within the construction work area. In order to ensure access to these homes during construction, Rover would construct temporary driveways to accommodate landowners. We have reviewed the site-specific plans, mitigation, and associated workspace justifications, and have found them acceptable, except where noted above.

In addition to the residential homes discussed above, 97 other structures such as sheds and barns, would be within the construction work areas. Rover would work with landowners to either purchase or relocate the structures. Appendix P denotes all structures that would be purchased by Rover.

Our experience has shown that when Project sponsors maintain communication with landowners during construction and restoration phases, issues in and near residential areas can be effectively managed and resolved. Rover has developed an environmental complaint resolution procedure that it would implement during Project construction and restoration. Rover would work to notify affected landowners or complainants (even if they are not the landowner) within 24 hours of receiving a complaint. If contact is not possible within 24 hours, Rover would continue to attempt to contact the affected parties either in person, by telephone, electronic mail, or by mail if necessary. All complaints and follow-up correspondence would be documented, and any action required to resolve the issue would be discussed with the affected landowner and/or complainant. We find these procedures to be consistent with those implemented by other companies for similar Projects. Further, we are recommending in section 5.2 that Rover file weekly reports with us to document complaints and resolution status.

Commercial structures in close proximity to the pipeline construction could also experience short-term disruptions to businesses as a result of in-street construction, detours, or restricted access due to lane closures. These impacts and corresponding mitigation measures are discussed in more detail in section 4.9.4. Implementation of Rover's general construction methods for working near residences and commercial areas, such as boring of public roadways, avoidance of road closures, development of Rover's Traffic Plan, and the environmental complaint resolution procedure would minimize disruption to residential and commercial areas to the extent practicable.

Operational impacts would be limited to the 17.2 acres of residential lands located within the permanent right-of-way, which would have some level of restricted use. Specifically, neither trees over 15-feet tall nor permanent structures would be permitted within the permanent right-of-way.

4.8.3.2 Planned Developments

Rover contacted local and county officials in the affected municipalities of West Virginia, Pennsylvania, Ohio, and Michigan in 2014 to identify planned residential, commercial, or industrial developments within 0.5 mile of the proposed facilities. None were identified. On June 26, 2015, we sent follow up emails to the county contacts that were provided by Rover requesting any information on planned developments. As of the issuance of this EIS, 17 of the 29 counties have responded. Some counties responded that townships may have jurisdiction over permitting in areas along the proposed route and in those cases additional emails were sent to townships. In Wayne County, Ohio a building was reportedly under construction at an existing welding business (Des Eck Welding). The property is within 0.5 mile of the Rover Project but is not crossed by the proposed route. A representative from Henry County, Ohio noted that while there were no planned developments, the area was zoned for residential development and may be developed in the future. A representative from Defiance County, Ohio stated that there were not any permitted projects within 0.5 mile of the pipeline, but that there was interest from two developers for locations along pipelines if they had the ability to access gas.

We received a comment on the draft EIS identifying a planned residential development in Washtenaw County, Michigan at MP MS 78.5. This planned subdivision site is located about 115 feet from the proposed construction workspace and about 150 feet from the estimated pipeline centerline. The pipeline would be collocated with an existing powerline right-of-way along the parcel and would not cross the portion of the property currently proposed for development. The landowner stated that a condition of approval for the development by the Township was that no aboveground pipeline structures could be erected. Rover has not proposed any aboveground facilities on the parcel. Based on this information, we conclude that the Rover Project would not result in a significant impact on the planned development or affect its design.

Additionally, in Rover's March 2016 supplemental filing it identified a minor route variation to avoid a planned commercial development in Livingston County, Michigan at MP MS 87.0. The parcel was approved in 2015 for a Self-Storage facility by Putnam Township (Putnam Township, 2015). As modified by Rover, the route follows an existing powerline right-of-way along the edge of the parcel. It appears that the landowner would still be able develop some portion of the parcel given the proposed routing along the parcel's property boundary. However, since we are unable to obtain a publicly available version of the developer's proposed site plan, we could not determine if the current siting would force the developer to alter its site plan or reconfigure the facility to accommodate the location of the pipeline. Therefore, **we recommend that**:

- **<u>Prior to construction</u>, Rover should file with the Secretary documentation of its consultations with the landowner of parcel MI-LI-021.500, including evidence that clarifies how the pipeline would will impact the planned development of the parcel as approved by Putnam Township.**

4.8.4 Agricultural Land

We define agricultural land as areas that are actively cultivated or rotated croplands, pastures, or hayfields. Construction of the Rover Project would affect 5,328.1 acres of agricultural land. During operation of the Project, the permanent pipeline right-of-way and aboveground facilities would affect 1,999.8 acres of agricultural land. Crops found within the Project area include wheat, corn, soybeans, carrots, green beans, tomatoes, lettuce, and potatoes. The Panhandle Project would impact 50.6 acres of agricultural land, all of which would be limited to the period of construction. The Trunkline Project would not impact agricultural lands.

4.8.4.1 General Agricultural Impacts

Pipeline Facilities

Construction activities such as clearing, grading, trenching, stripping, and backfilling would potentially impact agricultural lands by causing soil erosion by damaging surface or subsurface irrigation or drainage systems, and by degrading fertile soils through mixing and compaction. These impacts could result in direct loss of crops or pasture, as well as reduced crop productivity in future planting seasons.

Rover has proposed a number of mitigation measures to address impacts on agricultural lands, as described in the state-specific Rover AIMPs for Ohio and Michigan (see appendix G). Rover would adhere to the measures in its Plan for agricultural land crossed in Pennsylvania and West Virginia. Rover proposes to restore all disturbed agricultural areas associated with the construction of the Rover Project in accordance with the state-specific AIMP, its Plan, and all other applicable federal, state, and local permit requirements. Typical mitigation measures include topsoil segregation, decompaction, and repair/replacement of irrigation and drainage structures. The measures Rover proposes are discussed further below. Fields would generally be taken out of production for one growing season while the pipeline is constructed. Rover would compensate landowners for lost production and crop damages due to construction of the pipelines as negotiated with the landowners.

Crops, other than trees, would be allowed to be cultivated within both the construction and permanent rights-of-way once construction has been completed. As such, unless the land is used for orchards, maple syrup production, or other tree-related farming, no permanent change in land use or permanent reduction in the amount of land available for cultivation would be associated with the pipeline right-of-way. Rover would conduct post-construction monitoring to evaluate the recovery of revegetation. While issues such as compaction could result in impacts on crop yields if not properly mitigated, adherence to measures outlined in Rover's Plan and its AIMPs would limit the impacts to the short-term. According to our Plan, we consider revegetation successful once the impacted agricultural area has "crop growth and vigor" that is similar to adjacent undisturbed portions of the same field. As part of Rover's AIMPs, Rover has proposed to conduct post-construction monitoring of revegetation and crop yield in affected agricultural areas for one to two growing seasons after revegetation. In response to our recommendation in the draft EIS that Rover submit a 5-year post-construction monitoring program, Rover provided additional information regarding the compensation and monitoring measures it was committing to as part of the easement agreements. These included a commitment to compensate landowners for a full 3 years (from the start of construction) of productivity on lands impacted by construction. Additionally, Rover stated that if the landowner can demonstrate that yield reduction within the disturbed area is higher than originally estimated within the first 5 years or that yield is not 100 percent compared to adjacent off right-of-way land after the initial 5 years, Rover would compensate the landowner for the difference. However, Rover's agreement places the burden on the landowner to monitor and contact Rover if there are crop productivity concerns. We do not believe this is sufficient. Additionally, some issues such as either damage to or poor repair of drain tiles or drainage patterns related to contours may take longer to be revealed due to weather conditions or other factors following construction. Therefore, **we recommend that:**

- **<u>Prior to construction</u>, Rover should file with the Secretary a 5-year post-construction monitoring program to evaluate crop productivity in areas impacted by the construction of the Project. Rover should include in the program a commitment to file with the Secretary quarterly reports for a period of 5 years following construction documenting any crop-related problems, including soil heating near compressor stations identified by the company or landowner and describing any corrective action taken to remedy those problems. The program should stipulate that if any landowner agrees that revegetation and crop productivity are successful prior to the 5-year requirement, Rover should provide documentation in its quarterly reports, indicating which landowners have agreed that monitoring is no longer necessary. This documentation should include the landowner name, tract number, and the date of agreement.**

If crop yields in restored areas are not similar to or greater than those on adjacent undisturbed croplands, Rover would be required to develop and implement restoration measures in conjunction with appropriate agency personnel and landowners. Additionally, FERC staff would continue to conduct inspections and would impose enforcement or mitigation measures as necessary if after the end of 5 years FERC staff has determined not all restoration is satisfactory.

We received a comment on the draft EIS indicating that some agricultural parcels that would be crossed by the Project are double cropped. Double cropping is the process of planting and harvesting two crops from the same field in a single year (Borchers and Wallander, 2014). Mitigation for these agricultural lands would be similar to typical agricultural lands, as described above; however, farmers could be subject to loss of one or both harvests during Project construction depending on specific seasonality of the crop and timing of construction. Any such loss is also subject to compensation by Rover.

Aboveground Facilities

For the Rover Project, aboveground facilities would require 199.1 acres of agricultural land during construction and 77.4 acres during operation. The land required for operation of aboveground facilities would be converted to commercial/industrial use for the life of the Project. The Panhandle Project would impact 50.6 acres of agricultural land during construction. Of these, 2.7 acres are associated with the Panhandle-Rover Interconnect, which would be constructed within the boundaries of the Defiance Compressor Station. None of the affected land from the Panhandle Project would be required for operation and would be allowed to revert to pre-construction conditions. No agricultural lands would be impacted by the Trunkline Project.

Rover's Agricultural Impact Mitigation Plans

The purpose of the AIMPs is to help protect and conserve agricultural lands that may be affected by construction and/or operation of the pipeline. Rover would follow the policies outlined in the AIMP for activities occurring on privately owned farmland. Landowners may negotiate any action in advance of construction as long as the changes are acceptable to Rover and do not conflict with the requirements of FERC or any other permitting agency. Prior to the start of construction, Rover would provide the landowners with a telephone number and address to contact them regarding any work performed on the property or any construction-related concerns. The AIMP extends to any future construction and maintenance that may occur. All actions outlined in the AIMP would be implemented to the extent that they do not conflict with any federal, state, or local regulations.

When the pipeline crosses surface drains, diversions, grassed waterways, open ditches, or streams, at least 60 inches (5 feet) of cover over the pipeline would be maintained. In agricultural and pasture land, at least 48 inches (4 feet) of cover over the pipeline would be maintained. In areas where there is wooded or brushy land, the minimum depth would be 36 inches (3 feet). In areas where rock is the natural formation, the minimum depth would be 30 inches (2.5 feet).

Prior to trenching, Rover proposes to remove no less than 12 inches of topsoil. In areas where there is less than 12 inches of topsoil, all topsoil would be removed. Upon removal, topsoil would be kept separate from removed subsoil to prevent intermixing of the two layers. During backfilling of the trench, the subsoil material would be replaced first and all rocks greater than 4 inches would be removed from the surface of all exposed subsoil. After topsoil is backfilled to fill the trench, areas where heavy equipment or vehicles traversed the right-of-way would be decompacted by ripping to a depth of at least 18 inches in agricultural land and 12 inches in pasture and woodland. Backfilling and replacement of topsoil would be conducted so that original depth and contours of the topsoil would be restored. Unless originally present in the topsoil, all rocks greater than 4 inches would be removed from the topsoil surface following final restoration. Pumping of water from the trenches would be done in a manner to minimize or avoid damaging adjacent agricultural lands and crops. If damages cannot be avoided, the landowner would be compensated.

Landowners would be compensated for any construction-related damages caused by Rover on or off the construction work area. If there were trees of commercial or other value to the landowner that must be removed, Rover would allow the landowner the right to retain ownership of the trees and negotiate with them regarding the disposition of the trees. Removal and disposal of trees and brush would follow the landowners' wishes as well as federal, state, and local regulations. If the pipeline intersects an operational spray irrigation system, Rover would establish with the landowner an acceptable amount of time that the system could be offline. If crops were damaged during this time, the landowner would be compensated for the damaged crops.

Routes used to enter and exit the pipeline right-of-way would be agreed upon by Rover and the landowner. Temporary roads would be negotiated with the landowner and would be designed not to impede surface drainage and built to minimize soil erosion. If agreed upon by landowners, and allowed by regulatory agencies, temporary roads may be left intact after completion of the pipeline. If temporary roads are to be removed, the area that the roads were constructed through would be returned to its previous condition and use.

Following placing the pipeline in-service or the completion of initial right-of-way restoration, Rover has proposed a monitoring and remediation period of two growing seasons. As we stated above, we do not believe that time period is sufficient, and we have recommended that monitoring continue for up to 5 years following construction. Rover would be responsible for the cost of monitoring and remediation. This phase would be used to identify any remaining impacts from construction that are in need of correction. Conditions to be monitored are topsoil thickness, rock content, trench settling, crop production, drainage, and repair of fences. Onsite monitoring of agricultural lands would occur a minimum of three times during the growing season.

We received comments on the draft EIS from the Ohio Department of Agriculture (OHDA) regarding differences between Rover's Ohio AIMP and the *Ohio Pipeline Standard and Construction Specifications*, such as depth of cover in agricultural land (5 feet or 3 feet) and topsoil removal (entire right-of-way or partial right-of-way). We recognize the OHDA's experience with respect to soils, drainage, and other agricultural practices within Ohio and note that certain construction measures within the OHDA's construction specifications may assist Rover in lessening the duration of short-term impacts on agricultural lands and aid in more rapid and successful restoration. Therefore, **we recommend that**:

- **<u>Prior to construction</u>, Rover should consult with the OHDA on construction procedures to be used in agricultural lands in Ohio, and Rover should file with the Secretary any updates to the Ohio AIMP that result from coordination with the OHDA. Any comments received from the OHDA on Rover's Ohio AIMP should also be filed with the Secretary.**

Prior to construction, Rover would make an effort to locate all drain tile lines within the right-of-way and contact the landowners. If drain tile lines are damaged, cut, or removed during construction, the lines would be distinctly marked and these markers would not be removed until the line has been repaired. Before completing permanent drain tile repairs, all tile lines would be examined on both sides of the trench for the entire length within the right-of-way to check for damage that may have occurred due to construction equipment. Upon completion of the pipeline, all permanent repairs would be made within 45 days, weather and soil conditions permitting.

<u>Drain Tile Systems</u>

Drainage systems, such as drain tiles or diversion terraces, are used to improve the productivity of crops by diverting water from areas subject to saturation. The Rover pipeline would cross agricultural lands that make use of such systems. Rover has indicated it would consult with landowners, tenants, and drainage district officials prior to construction to identify existing and planned drainage systems along the pipeline right-of-way. Rover has proposed to restore agricultural drainage systems to their original conditions or better, and would continue restoration until systems are fully operating. Specific requirements for drain tile repair are described in the Rover AIMP for Ohio and Michigan (see appendix G). Terraces and drainage trenches would be restored to their original contours, as much as practicable, to ensure proper function.

In order to further mitigate impacts on drain tile systems, Rover has retained a consultant with knowledge and expertise in drain tile systems in the Project area to meet with individual landowners and develop site-specific plans for mitigation and restoration of agricultural lands (Drain Tile Relocation and Reclamation Plans). However, we received comments on the draft EIS from several landowners that while Rover's consultant has developed plans with input from landowners, Rover has not committed to actually implement the plans themselves. Given that the plans are being developed through coordination with landowners and Rover's consultants, and implementation of these plans would minimize impacts on drain tile systems crossed by the Project, **we recommend that:**

- **<u>Prior to construction in agricultural lands</u>, Rover should file with the Secretary its final Drain Tile Relocation and Reclamation Plans including landowner concurrence with the plans.**

Rover states it would "encourage" its contractors to use local drain tile contractors to redesign, construct, and repair any tiles damaged by the Rover Project. We do not believe that this is acceptable. The design and installation of drain tiles is precision work that should be done by professionals who are knowledgeable of both drain tiles and local conditions. Therefore, **we recommend that:**

- **<u>Prior to construction</u>, Rover should commit to hire local drain tile contractors to install/repair drain tiles that are damaged or need to be rerouted due to construction activities.**

Rover has committed to stake or flag all encountered, damaged, cut, and/or removed drain tiles in a manner that the markings would remain visible until repairs are completed. The location of the tiles would be recorded using GPS technology. The identification and marking of all encountered, severed, and/or damaged tile lines is important for reference in the event of future drainage problems on affected agricultural lands. **We further recommend that:**

- **<u>Upon completion of construction</u>, Rover should provide information on encountered, severed, and/or damaged drain tile lines to the landowner, and the local county Soil and Water Conservation District, and the information should be kept in the company's landowner records for future reference.**

<u>Pipeline Depth of Cover</u>

As previously stated, Rover proposes to install its pipeline with at least 4 feet of cover in agricultural lands. Deeper burial may be required for the crossings of some drain tile systems, as well as underground utilities. Rover would maintain at least 2 feet of separation between the pipeline and tile line. The pipeline would be placed below the drain tiles, and would only be placed over the tiles with landowner permission. If 2 feet of separation is not feasible, Rover would negotiate resolution with the landowner.

<u>Topsoil Segregation</u>

Upon removal, topsoil would be kept separate from removed subsoil to prevent intermixing of the two layers. During backfilling of the trench, the subsoil material would be replaced first and all rocks greater than 4 inches would be removed from the surface of all exposed subsoil. In sections of the right-of-way that would be crossed by construction vehicles and equipment, and after topsoil has been replaced, deep ripping at least 18 inches deep would occur. Unless originally present in the topsoil, all rocks greater than 4 inches would be removed from the topsoil surface following final restoration.

Landowners Having the Ability to Negotiate for Other/Additional Mitigation

Rover's AIMPs allow landowners to negotiate for different and/or additional mitigation in agricultural areas. We encourage landowners and Rover to work together regarding the construction and restoration actions to occur on their property.

4.8.5 Recreation and Special Interest Areas

The Projects would not cross any national Wild and Scenic Rivers, National Parks, National Park Service Wilderness Areas, state forests, Indian Reservations, or lands managed by or associated with the U.S. Bureau of Land Management, Wetland Reserve Program, Emergency Conservation Program, or Grassland Reserve Program. The Projects are outside of any Coastal Zone Management Act areas; as such, no impacts on coastal resources are expected. However, portions of the Rover Project could affect several other recreation and/or special interest areas that are within 0.25 mile of the Project area (see table 4.8.5-1). Further discussion of these areas is included below. Scenic byways that would be crossed by the Projects are discussed in section 4.8.5.

One of the primary concerns when crossing recreation and special interest areas is the impact of construction on the purpose for which the area was established (e.g., the recreational activities, public access, and resources the area aims to protect). Construction could alter visual aesthetics by removing existing vegetation and disturbing soils; these potential impacts are discussed in section 4.8.7. Construction could also generate dust and noise, which could be a nuisance to recreational users. Construction could also interfere with or diminish the quality of the recreational experience by affecting wildlife movements or disturbing hikers while using trails.

In general, impacts on recreational and special interest areas would be temporary and limited to the period of active construction, which typically would only last a few days to several weeks in any one area. These impacts would be minimized by implementation of Rover's Plan and Procedures. In addition, Rover has proposed specific mitigation measures as described below for certain recreation and special interest areas.

Construction periods could coincide with a variety of hunting seasons. No state-designated land would be crossed in Pennsylvania, West Virginia, or Ohio; therefore, public hunting areas in these states would not be affected. Potential impacts on hunting on Michigan state public lands are discussed in section 4.8.5.3. However, it is also likely that hunting occurs on private lands throughout the Project area; therefore, Rover would educate construction workers about hunting seasons prior to initiation of work, require workers to wear orange vests, and would conduct daily safety meetings to inform workers of relevant conditions. Rover would coordinate with landowners regarding the timing of construction activities to minimize potential impacts.

The majority of the recreation areas listed in table 4.8.5-1 would be crossed using the HDD or bore method, which would avoid direct impacts on those areas.

Following construction, most recreational use of open land would be able to continue. Rover is continuing to consult with the owners and managing agencies of recreation and special interest areas regarding the need for specific construction mitigation measures.

4.8.5.1 Organic Farm Lands and Specialty Crops

The Rover pipeline would cross two Christmas tree farms along Mainlines A and B (see table 4.8.5-2). Additionally, a grass-fed cattle farm would be crossed at MP SEL 9.42. Rover has indicated it is coordinating with landowners to mitigate and compensate for potential impacts on these lands. If additional specialty crops are identified prior to construction, Rover would coordinate with landowners regarding mitigation and compensation. We received comments from the Ohio Ecological Food and Farm Association (OEFFA) regarding an organic farm that would be crossed by the Project at MP MAB 57.8. Since Rover has not provided specific mitigation measures for organic farms crossed by the Project, **we recommend that:**

- **<u>Prior to construction</u>, Rover should file with the Secretary, for review and written approval of the Director of OEP, an impact avoidance, minimization, or mitigation plan for the organic farm at MP MAB 57.8. Rover should include documentation that the plan was developed in consultation with the landowner.**

TABLE 4.8.5-1

Federal, State, and Recreation Lands Located within 0.25 Mile of the Rover Pipeline Project

Pipeline Facility	Enter MP	County	State	Name of Area	Designation Type	Existing Land Use a	Distance from Project (feet)	Crossing Length (feet)	Construction (acres)	Operation (acres)	Crossing Method
Sherwood Lateral	17.1	Tyler	WV	Conaway Run Lake Wildlife Management Area	State	N/A	759	0	0.0	0.0	N/A
Sherwood Lateral	18.8	Tyler	WV	Jug Wildlife Management Area	State	N/A	60	0	0.0	0.0	N/A
Sherwood Lateral	35.5	Wetzel	WV	Ohio River Islands National Wildlife Refuge (Paden Island)	Federal	N/A	110	0	0.0	0.0	N/A
Sherwood Lateral	35.0	Monroe	OH	Ohio River Scenic Byway (OH-7)	Other	OL	0	50	0.0	0.0	HDD
Sherwood Lateral	37.4	Monroe	OH	Wayne National Forest – Within administrative boundary on private land	Other	FW	0	2,485	8.3	2.8	Conventional
Sherwood Lateral	40.4	Monroe	OH		Other	FW, Ag, OL	0	39,752	131.4	45.5	Conventional
Berne Lateral	0.0	Monroe	OH	Wayne National Forest – within administrative boundary on private land	Other	FW, Ag, OL	0	11,875	26.0	14.0	Conventional
Majorsville Lateral	12.3	Belmont	OH	Ohio River Scenic Byway (OH-7)	Other	OL	0	75	0.0	0.0	HDD
Burgettstown Lateral	2.1	Washington	PA	State Game Land 117	State	N/A	80	0	0.0	0.0	N/A
Burgettstown Lateral	3.9	Washington	PA	Hillman State Park	State	N/A	615	0	0.0	0.0	N/A
Burgettstown Lateral	15.0	Hancock	WV	Mountaineer Woodview Golf Course	Other	OL	0	287	TBD	TBD	Open-Cut and HDD
Burgettstown Lateral	16.5	Jefferson	OH	Ohio River Scenic Byway (OH-7)	Other	OL	0	75	0.0	0.0	Bore

TABLE 4.8.5-1 (continued)

Federal, State, and Recreation Lands Located within 0.25 Mile of the Rover Pipeline Project

Pipeline Facility	Enter MP	County	State	Name of Area	Designation Type	Existing Land Use a	Distance from Project (feet)	Crossing Length (feet)	Construction (acres)	Operation (acres)	Crossing Method
Burgettstown Lateral	46.4	Carroll	OH	Leesville Lake Wildlife Area	State	N/A	975	0	0.0	0.0	N/A
Burgettstown Lateral	48.9	Carroll	OH	Buckeye Trail (Autumn Road)	Other	OL	0	25	0.0	0.0	Bore
Supply Connector A and B	9.1	Harrison	OH	Tappan-Moravian Trail Scenic Byway (Tappan-Scio Road)	Other	OL	0	25	0.0	0.0	Bore
Supply Connector A and B	14.6	Harrison	OH	Buckeye Trail (Willis Run Road)	Other	OL	0	25	0.0	0.0	Open-Cut
Mainlines A and B	24.1	Tuscarawas	OH	Buckeye Trail (Dawn Road/CR 320)	Other	OL	0	25	0.0	0.0	Bore
Mainlines A and B	24.6	Tuscarawas	OH	Atwood Lake	Other	N/A	935	0	0.0	0.0	N/A
Mainlines A and B	35.4	Tuscarawas	OH	North Country Scenic Trail	Other	OL	0	25	0.0	0.0	Bore
Mainlines A and B	38.2	Stark	OH	Lake Bolivar Reservoir	Other	N/A	106	0	0.0	0.0	N/A
Mainlines A and B	42.2	Stark	OH	Buckeye Trail	Other	FW	0	25	0.0	0.0	HDD
Mainlines A and B	42.2	Stark	OH	Ohio and Erie Canal National Heritage Area	Other	FW, Ag, OW	0	632	0.0	0.0	HDD
Mainlines A and B	42.6	Stark	OH	Ohio and Erie Canalway Scenic Byway (Riverland Ave)	Other	OL	0	25	0.0	0.0	Bore
Mainlines A and B	70.0	Wayne	OH	Killbuck Marsh Wildlife Area	State	N/A	1,663	0	0.0	0.0	N/A
Mainlines A and B	81.6	Ashland	OH	Lincoln Highway Historic Byway (CR-30A)	Other	OL	0	25	0.0	0.0	Bore

TABLE 4.8.5-1 (continued)

Federal, State, and Recreation Lands Located within 0.25 Mile of the Rover Pipeline Project

Pipeline Facility	Enter MP	County	State	Name of Area	Designation Type	Existing Land Use a	Distance from Project (feet)	Crossing Length (feet)	Construction (acres)	Operation (acres)	Crossing Method
Mainlines A and B	142.2	Seneca	OH	Sandusky River	Other	OW	0	160	0.0	0.0	HDD
Mainlines A and B	177.7	Wood	OH	Wildlife Habitat Restoration Program Land	State	N/A	355	0	0.0	0.0	N/A
Mainlines A and B	200.4	Henry	OH	Maumee River	Other	OW	0	435	0.0	0.0	HDD
Mainlines A and B	200.4	Henry	OH	Buckeye Trail	Other	OL	0	25	0.0	0.0	HDD
Mainlines A and B	200.4	Henry	OH	Maumee Valley Scenic Byway (Highway 424)	Other	OL	0	25	0.0	0.0	HDD
Mainlines A and B	200.4	Henry	OH	Independence Dam State Park	State	N/A	490	0	0.0	0.0	N/A
Market Segment	16.6	Fulton	OH	North Country Scenic Trail	Other	Ag	0	25	0.0	0.0	Bore
Market Segment	76.5	Washtenaw	MI	Chelsea State Game Area	State	N/A	4,306	0	0.0	0.0	N/A
Market Segment	82.5	Washtenaw	MI	Pinckney Recreation Area	State	FW, Ag, OL	0	7,603	19.4	8.7	Conventional
Market Segment	88.9	Livingston	MI	Pinckney Recreation Area	State	N/A	1,175	0	0.0	0.0	N/A
Market Segment	89.8	Livingston	MI	Timber Trace Golf Club	Other	OL	0	6,736	21.2	7.7	Conventional
Market Segment	92.8	Livingston	MI	Gregory State Game Area	State	N/A	545	0	0.0	0.0	N/A

a FW – Forest/Woodland; Ag – Agricultural; OL – Open Land; R – Residential; IC – Industrial/Commercial; OW – Open Water; Ot – Other. No land use provided for those areas not crossed by the Project construction workspace.

N/A = This feature would be within 0.25 of mile of the pipeline but would not be crossed by the pipeline.

TABLE 4.8.5-2 **Organic and Specialty Crops Crossed by the Rover Pipeline Project**						
Crop or Special Use Type	**Project Segment**	**County/State**	**Start MP**	**End MP**	**Acres Impacted**	
					Construction	**Operation**
Christmas tree farm	Mainlines A and B	Ashland County, OH	94.9	95.1	5.3	1.4
Christmas tree farm	Mainlines A and B	Wayne County, OH	69.8	70.0	4.6	1.4
Organic Dairy Farm	Mainlines A and B	Wayne County, OH	57.8	57.9	2.4	1.8
Grass-fed cattle, chickens, hay, personal crops	Seneca Lateral	Monroe County, OH	9.42	9.54	4.38	0.8

4.8.5.2 Conservation Reserve Program

The CRP is managed and administered by USDA's Farm Service Agency (FSA) with technical assistance provided by USDA's NRCS. The program provides eligible farmers and ranchers both technical and financial assistance to conserve and protect soil, water, and related natural resources on their land. In its application Rover identified 47 parcels that would be crossed by the Project and that are potentially enrolled in the CRP, including 31 parcels in Michigan and 16 parcels in Ohio. However, as the FSA does not provide locations of CRP enrolled lands, additional parcels are expected to be identified through landowner discussions and negotiations. Rover is continuing to consult with landowners and the local farm bureaus to identify any further lands enrolled in these program lands.

Temporary and permanent impacts on non-forested CRP lands would generally be similar to those described for agricultural lands (see section 4.8.4.1) and mitigation implemented would be similar to mitigation outlined in the AIMPs (see appendix G). However, in order to maintain eligibility in the program, specific mitigation measures may be required. For parcels where CRP enrollment was dependent on tree plantings, these lands may be subject to removal from the program if they are within the permanent right-of-way. To ensure that these lands are not removed from the CRP program and remain eligible, Rover has agreed to work with landowners and local FSA offices to develop restoration plans.

Because consultations are ongoing with the landowners to determine if lands crossed by the Rover Project are enrolled in FSA lands, and specific mitigation for these areas has not yet been identified, **we recommend that:**

- **<u>Prior to construction</u>, Rover should file with the Secretary, for review and written approval of the Director of OEP, a complete list of all CRP enrolled lands that would be crossed by the Project by milepost. In addition, Rover should file with the Secretary any revised impact mitigation measures or conservation plans that will be necessary in order to maintain CRP compliance along with confirmation from the FSA that parcels will remain eligible for the program if the specified mitigation is implemented. If parcels will no longer be eligible for enrollment, Rover should identify how it will compensate landowners for the lost program benefits.**

4.8.5.3 Other Special Use Lands

Two trails would be crossed by the Rover Project: the North Country National Scenic Trail and the Buckeye Trail. The North Country National Scenic Trail would be crossed at MP MAB 35.4 and again at MP MS 16.6. Both would be crossed using the bore method, preventing direct impacts on the trail and users of the trail. The Buckeye Trail would be crossed five times by Rover pipelines: MPs SAB 14.6, MAB 24.1, MAB 42.2, MAB 200.4, and BGL 48.9. Rover would use the HDD or bore crossing method for all but one of the crossings of the Buckeye Trail (MP SAB 14.6), which would be open-cut. During construction, the portion of the trail that would be open-cut would be closed resulting in a temporary impact on recreational users. Once the crossing is complete and the area has been restored, the trail would reopen for public use.

The Rover Project would cross the Pinckney Recreation Area between MPs MS 82.5 and MS 84.0. The Pinckney Recreation Area has over 11,000 acres and is used for a variety of activities including camping, hiking, biking, fishing, boating, hunting, and picnicking. Rover would cross this recreation area using conventional open-cut methods; however, Rover would parallel an existing right-of-way to limit the amount of new clearing that would be required for the crossing. The pipeline would cross several trails within the recreational area. The Losee Lake Hiking Trail would be crossed at three locations. The Pinckney-Waterloo Trail and the Pinckney-Potawatomi Trail would be crossed at a location where the two trails combine into a single trail. Following construction, Rover would restore the trails. We received a comment voicing concerns for the closing of trails during construction. Rover only provided a statement that it would work with MIDNR to minimize impacts on hikers who use the trails; however, Rover has provided no details on how it would minimize impacts of trail closures or detour hikers. Therefore, **we recommend:**

- **<u>Prior to construction</u>, Rover should file with the Secretary, for review and written approval of the Director of OEP, an impact avoidance, minimization, or mitigation plan for the trails located in the Pinckney Recreation Area. Rover should include documentation that the plan was developed in consultation with the MIDNR.**

Two golf courses would be crossed by the Rover Project: the Mountaineer Woodview Golf Course at MP BGL 15.0 and the Timber Trace Golf Club near MP MS 89.9. A portion of the Mountaineer Woodview Golf Course would be crossed using an HDD, which would mitigate direct impacts on the golf course and its users. However, a portion of the golf course would contain the HDD exit point as well as portions of the construction right-of-way and additional temporary workspace. The portion of the property that would contain the right-of-way and additional temporary workspace is at the edge of the property and does not appear to be part of the active golf course. As such, construction may result in visual and noise impacts for golfers who are in proximity to the work areas. Rover is proposing to open cut 1.3 miles of the Timber Trace Golf Club. The pipeline would cross directly through several fairways as well as through the only parking lot on site. Rover is coordinating with the owners of the Timber Trace Golf Club and have agreed to construct through the golf course during the winter to minimize interference with the business. Visual impacts are discussed in section 4.8.7, and noise impacts are discussed in section 4.11.2.

In general, recreation areas and special use areas crossed by the Rover Project are expected to experience some temporary impacts during construction, such as clearing of trees, noise, dust, and limited access which may prevent or curtail recreational activities. Users of these areas such as hikers, wildlife enthusiasts, sightseers, bikers, and other recreationalists may be prevented from use of the immediate area around the temporary right-of-way during construction. Nearby recreation areas and special use areas are expected to experience similar temporary impacts as areas are crossed, but as the distance to the construction work area increases, these impacts would generally decrease.

Rover would continue to consult with the appropriate federal, state, and managing agencies to develop and implement measures to mitigate and reduce impacts on these areas as needed. Direct access to some entry points within these areas may be temporarily limited or restricted due to increased traffic or road closures during construction. For further discussion of transportation impacts and mitigation measures, refer to section 4.9.4.

4.8.6 Hazardous Waste Sites

Based on field and database research, as well as in consultation with state environmental agencies, Rover identified one brownfield site about 350 feet south of MP BGL 16.3. Information on contaminated soil, groundwater, and sediments near the proposed facilities is provided in sections 4.2.2, 4.3.1.6, and 4.3.3, respectively. No other hazardous waste sites were identified within 0.25 mile of the Rover Project.

This brownfield site would not be crossed by the pipeline; therefore, no impacts associated with construction, installation, and operation of the Project are expected. During construction, if hazardous materials are encountered, Rover would follow applicable regulations in disposal and mitigation of the hazardous material.

No hazardous waste sites have been identified within proximity to either the Panhandle or Trunkline Projects.

4.8.7 Visual Resources

Visual resources refers to the composite of basic terrain features, geologic features, hydrologic features, vegetation patterns, and anthropogenic features that influence the visual appeal of an area for residents or visitors. The Projects would cross state and privately owned lands. No federal lands, or national or state designated wild or scenic rivers would be crossed.

4.8.7.1 Pipeline

Visual resources within the Project areas are a function of geology, climate, and historical processes, and include topographic relief, vegetation, water, wildlife, land use, and human uses and development. Portions of the Rover pipeline would be collocated or adjacent to existing pipeline and/or utility rights-of-way. As a result, the visual resources along those portions of the Project route have been previously affected by other similar activities.

The width of the construction right-of-way would vary depending on the size of the pipe, the number of pipes to be installed, and the topography and land use type of the area. Construction right-of-way widths would vary from 75 to 150 feet. In upland areas, Rover would maintain a 50-foot-wide permanent right-of-way where a single pipeline is installed and a 60-foot-wide permanent right-of-way where dual pipelines are installed.

Visual impacts associated with the construction right-of-way and extra workspaces include the removal of existing vegetation and the exposure of bare soils, as well as earthwork and grading scars associated with heavy equipment tracks, trenching, blasting (if required), and machinery and tool storage. Other visual effects could result from the removal of large individual trees that have intrinsic aesthetic value; the removal or alteration of vegetation that may currently provide a visual barrier; or landform changes that introduce contrasts in visual scale, spatial characteristics, form, line, color, or texture.

Visual impacts would be greatest where the pipeline route parallels or crosses roads and the pipeline right-of-way may be seen by passing motorists; from residences where vegetation used for visual screening or for ornamental value is removed; and viewsheds where the pipeline is routed through forested areas. The duration of visual impacts would depend on the type of vegetation that is cleared or altered. The duration of visual impact from clearing would be shortest in open areas where the re-establishment of vegetation following construction would be relatively rapid (generally less than 3 years). The duration would be greater in forested land, which would take many years or decades to regenerate. The greatest potential visual impact would result from the removal of large specimen trees, which would take longer than other vegetation to regenerate and would be prevented from re-establishing on the permanent right-of-way.

The area crossed by the pipeline is predominately agricultural land and forested lands. While trees cleared within temporary construction work areas would be allowed to regenerate to pre-construction conditions following construction, impacts on forest resources within these areas would last for many years. The forested setting would help to minimize the number of visual receptors along the forested portion of the right-of-way. The visual effect of the pipeline would also be mitigated by the HDD crossings, where surface impacts and impacts on visual resources between the entry and exit holes would be avoided. After construction, all disturbed areas would be restored, and areas outside of the permanent right-of-way would be returned to pre-construction conditions in compliance with federal, state, and local permits; landowner agreements; and Rover's easement requirements, with the exception of aboveground facility sites.

4.8.7.2 Aboveground Facilities

Of the 21new meter stations that would be constructed for the Rover Project, 11 would be constructed within the footprint of an associated compressor station. The other nine meter stations would be stand-alone facilities. The CGT Meter Station would be constructed on open land with several residences nearby. These residents would be able to view construction equipment and personnel during the construction phase, as well as view the facility while in operation. The Clarington A Meter Station would be constructed in open land. The closest residence is 0.1 mile away from the Clarington site; however, there is an existing vegetation buffer that would limit views of the facility. The Madison Meter Station would be constructed in agricultural land. No residences are within the viewshed of this meter station. The Gulfport Meter Station would be constructed on open land with several residences less than 0.2 mile from the site. There are several natural tree buffers between this meter station site and the residences. During construction, the residents may see an increase in truck traffic and may be able to view some construction workers and equipment. During operation, impacts on the viewshed due to the Gulfport Station are not anticipated to be significant due to the natural vegetation buffer surrounding the site. Motorists along the roadway would be able to view construction workers and equipment as well as the facility during operation; however, their view would be of short duration. The Consumers Energy Meter Station would be constructed in an agricultural field along the Rover pipeline route. The closest home is about 275 feet from the meter station site. There are some trees that would act as a visual buffer; however, this meter station could be visible from the residence. This would result in a minor, permanent impact. The Berne, Vector, and ANR Meter Stations would be adjacent to other industrial areas, while the Majorsville Meter Station is within a forested area with no visual receptors.

Overall, each of the meter stations would be installed at locations with aesthetics and topography similar to that described for the pipeline and any nearby compressor station. Most of the meter stations would be installed on primarily open land and would be visible from nearby roads and residences. Meter stations serving as interconnections with other pipeline systems are not expected to create a unique visual impact on the area as they would be close to existing, previously disturbed and cleared pipeline rights of way.

Rover would construct 10 new compressor stations. Compressor Station sites typically include several buildings, piping, meter stations, mainline valves, exhaust stacks, and pig launcher/receiver facilities. Each site would be enclosed by a chain-link fence.

Construction of the Sherwood Compressor Station would impact a total of 34.5 acres of mainly open and forested land. There are several residences southwest of the site; however, Rover would maintain vegetation screening between these residences and the compressor station, which would limit visual impacts on residents. There is a residence that is currently within the property boundary of the compressor station site. Rover has purchased this property.

The Seneca Compressor Station would be within close proximity to several residences, including one within 160 feet of the compressor station boundary. Rover has stated that it would maintain a vegetation screen between the residences and the compressor station to limit the visual impacts. Occupants of these homes may be able to view construction activities as well as several of the structures and fencing at the compressor station. This would represent a minor, but permanent impact on the viewshed of the residence. No impacts are anticipated to the other residences within the vicinity of the Seneca Compressor Station.

The Clarington Compressor Station would be constructed within forested lands, with Rover maintaining a vegetation buffer around the majority of the facility. There is one residence that could potentially experience some visual impacts. The residence would be screened from most of the facility during operation; however, during construction residents would likely be able to view construction vehicles and workers. Additionally, several trees within the viewshed of the residence would be removed during construction, altering the current views for residents. These impacts are anticipated to be a minor but permanent impact.

Construction of the Majorsville Compressor Station would take place within a heavily forested area. As such, no residences or other potential viewsheds would be impacted by construction or operation of this compressor station.

The Cadiz Compressor Station would be constructed within an open area, with several other industrial areas in close proximity. While the area would be open and with few vegetation buffers, there are no residences that would be impacted by the change in the viewshed. There is one paved road close to the compressor station; however, the area is already industrialized and motorists would not be significantly impacted from construction and operation of the compressor station.

Rover's proposed site for the Burgettstown Compressor Station is located within mainly forested land. The area surrounding the site is dominated by mature woody vegetation, creating a natural buffer to any nearby residences or viewers. Therefore, while clearing of forested land would be required, there are limited visual receptors in the area.

Mainline Compressor Station 1 would be constructed within agricultural land and would abut Azalea Road. There are several residences along Azalea Road that would face the compressor station and have a direct line of sight to the facilities, including an 1843 Federal House as described in section 4.10.1.3. During construction, residents would be able to view construction equipment and workers. Once the facility is constructed, residents would be able to see most of the buildings and structures, as well as the lighting within the facility and the fences surrounding these areas. Several of the residences have vegetation buffers on their property that may help screen views of the compressor station. Visual impacts during operation would be moderate and permanent. Rover developed a visual screening plan (in response to our recommendation in the draft EIS) to mitigate for impacts on the residents along Azalea Road. According to the plan, Rover would plant 4-foot-tall Colorado blue spruce along the property boundary along Azalea Road in an effort to limit views of the facility to residents. Additionally, Rover indicated it would paint the compressor station, motor control center building, and instrument air buildings charcoal gray with polar white roofs and trim. While the measures would serve to limit the views of the station we do not believe the current spacing of trees is sufficient to provide screening in a meaningful way. Therefore**, we are recommending** below that Rover revise the visual screening plan for Mainline Compressor Station 1.

Construction of Mainline Compressor Station 2 would occur on agricultural land along South Elyria Road. There is one residence along this road that is about 85 feet from the proposed compressor station property boundary. However, the footprint of the compressor station would not comprise the entire portion of the parcel and there would be sufficient vegetation screening between the residence and the compressor station to obscure the compressor station from view. Overall, the compressor station would represent a negligible impact on the viewshed for this and the other residents along South Elyria Road.

Mainline Compressor Station 3 would be constructed on agricultural land, with the surrounding areas consisting of flat agricultural land and several residences. Residents may be able to view both construction activities as well as the compressor station facility. However, several of the residences contain large trees and other vegetation buffers on the property, which could limit the views of the compressor station. Impacts on these residences would be moderate and permanent. Rover developed a visual screening plan (in response to our recommendation in the draft EIS) to mitigate for the visual impacts. Rover would plant 4-foot-tall Colorado blue spruce at 60-foot spacing around the compressor station fence, which would limit views of the facility to residents along Albaugh Road. Additionally, Rover indicated it would paint the compressor station, motor control center building, and instrument air buildings charcoal gray with polar white roofs and trim. While the measures would serve to limit the views of the station we do not believe the current spacing of trees is sufficient to provide screening in a meaningful way. **Therefore, we recommend that:**

- **<u>Prior to construction of Mainline Compressor Stations 1 and 3</u>, Rover should file with the Secretary revised visual screening plans for these compressor stations that incorporate a second row of Colorado blue spruce and adopt a spacing of 20 feet or less between the trees in each row.**

The Defiance Compressor Station would be constructed within agricultural land. The surrounding area is predominantly agricultural and forested with several residences within view of the compressor station site. However, several of the homes in the area have vegetation on the property that would screen their views of the compressor station. Therefore, we believe that impacts on these residences would be minor.

In general, the impacts on visual resources resulting from the construction and operation of the mainline valves would be minimal as each site is small (typically less than 0.1 acre) and would be operated within the pipeline operational right-of-way or within an aboveground facility (e.g., compressor or meter station site). Mainline valves along the operational right-of-way would be enclosed in a chain-link security fence.

Pig launchers and pig receivers would be constructed within the pipeline right-of-way or near existing developed sites, thereby minimizing impacts on visual resources.

Both the Panhandle and Trunkline Projects would require updates to existing aboveground facilities. The land use at these existing facilities is dominated by industrial, open, and agricultural land. Several of the facilities are along roadways or near residences. During construction, motorists and residents in these areas would be able to view construction activities, including workers and equipment. These impacts would be limited to the period of construction, resulting in a temporary, minor impact. However no new permanent facilities would be constructed, and all land would be allowed to revert to pre-construction conditions. Therefore, no permanent impacts on the viewshed are expected.

4.8.7.3 Contractor Yards

The contractor yards would be located on lands classified as agricultural, open, and industrial/commercial. With the possible exception of minor grading activities and surfacing (e.g., gravelling), soils at the contractor yards would not be disturbed. As a result, there would be no permanent impacts on visual resources associated with the use of these yards. After initial development of the yards, the only impacts at the yards would be temporary when trailers, vehicles, pipe, and other construction-related materials are stored at these sites during construction.

4.8.7.4 Access Roads

Rover proposes to use 225 roads for access to the pipeline rights-of-way and associated facilities during construction, of which 53 would be for permanent access to the pipeline right-of-way and aboveground facilities during operation. Access roads would be maintained at a width of 6 to 75 feet as required for curves and corners. Most of the existing roads are currently paved, graveled, or have dirt surfaces and would require minor improvements, and would not have a significant impact on visual resources. Alternatively, 44 temporary access roads and 42 permanent access roads would be newly constructed or would require extensions of existing roads. Construction of these roads would require some tree clearing in addition to grading and graveling, impacting 20.0 acres.

After construction, the 172 roads used for temporary access would be returned to pre-construction conditions unless another arrangement is mutually agreed upon with the landowner. The permanent access roads retained for operation would result in 27.4 acres of roadway, of which 10.4 acres would be associated with the new permanent access roads or expansions. For access roads that require tree clearing, there would be a long-term impact. However, given the limited amount of clearing (4.8 acres) that would be needed, as well as the limited footprint of any single access road, we conclude that visual impacts from access roads would be minor.

4.8.7.5 Scenic Byways

The Rover pipeline route would cross two roads listed as national scenic byways. The Ohio Scenic Byway would be crossed at MPs SWL 35.0, MJL 12.4, and BGL 16.2. All three crossings of the Byway would be completed using the HDD crossing method. The HDD entry and exit points would not be visible from the roadway. Therefore, no visual impacts on motorists along the Byway would occur. The Ohio and Erie Canalway Scenic Byway is a road that follows alongside the Ohio and Erie Canal. The road would be crossed at MP MAB 42.6 using an HDD. The HDD exit pit may be visible to motorists along the road; however, this would be a temporary impact.

The Rover pipeline route would not cross any state scenic roadways in Pennsylvania, West Virginia, or Michigan. The route would cross five state scenic roadways in Ohio. The Maumee Valley Scenic Byway at MP MAB 200.4 and the Historic National Road at MP CLL 18.8 would be crossed using the HDD crossing method. These crossings would result in no temporary or permanent impacts on visual resources since the HDD entry and exit points would not be visible from the roadway. The pipeline route would cross the remaining three byways using the bore crossing method. The Lincoln Highway Historic Byway would be crossed at MP MAB 81.6, the Tappan-Moravian Trail at MP SAB 9.1, and the Drover's Trail Scenic Byway at MP MJL 19.5. While there would be no direct impacts on the roadways themselves, construction workers and equipment would be visible to the motorists using the roadways. However, these impacts would be limited to the period of construction. During operation, no impacts or changes to the viewshed are expected on the Lincoln Highway Historic Byway. The construction along the right-of-way in the vicinity of the Tappan-Moravian Trail road crossing would require removal of some trees resulting in a permanent impact on motorists along the byway; however, given the limited number of trees within the immediate view of users of the roadway, we anticipate this impact to be minor. Construction of the pipeline right-of-way would require tree clearing along the north side of Drover's Trail Scenic Byway. The newly cleared pipeline right-of-way would represent a permanent change to the viewshed for motorists along the byway. However, given the limited time that any given motorist would be in this area, we anticipate that this would be a minor impact.

4.8.7.6 Agricultural Lands and Open Land

About 24 percent of the Rover Project pipeline route would be collocated or adjacent to existing rights-of-way for pipelines, electric transmission lines, or roads. Visual impacts associated with pipeline construction in agricultural and open land areas along the route would be temporary and would result from the presence of construction equipment and post-construction visual scarring. In agricultural land, any visual scarring would remain within the right-of-way until new crops are planted. After replanting of the crops, any remaining visual impact from pipeline construction would be minor, but visual evidence of construction may last for a few years.

4.8.7.7 Forested Land

The Rover Project would affect 3,034.2 acres of forested land during construction. Trees within the construction right-of-way would be cleared. The permanent right-of-way would be periodically mowed thereby preventing regeneration of trees for the life of the Rover Project. In the construction right-of-way, trees would be allowed to re-grow; however, larger trees likely would not grow to maturity within the construction right-of-way for decades. The permanent right-of-way would generally be maintained clear of trees. Removal of trees along the permanent rights-of-way in otherwise forested areas would leave a corridor that would persist for the duration of pipeline operation and that would be visible from some vantage points in the Rover Project area. Overall, the visual impact related to the construction right-of-way would be long-term, but minor and localized, while the visual impact related to the permanent right-of-way would be permanent, but relatively minor and localized.

4.9 SOCIOECONOMICS

This section addresses potential socioeconomic impacts on the areas surrounding the proposed Projects. The Rover Project would be located in 27 counties across 4 states, including 5 counties in West Virginia, 1 in Pennsylvania, 18 in Ohio, and 3 in Michigan. The Panhandle Project would be located in 8 counties across 4 states including Illinois, Indiana, Ohio, and Michigan. The Trunkline Project would have components in 5 counties across 3 states: Illinois, Mississippi, and Tennessee. The primary socioeconomic impacts include population effects associated with the influx of construction workers and the impact of these workers on public services and temporary housing during construction. Secondary socioeconomic effects include increased vehicle traffic necessary to move materials, equipment, and workers to and from the right-of-way, increased property tax revenue, job opportunities, and income associated with local construction employment.

4.9.1 Population and Employment

Table 4.9.1-1 provides a summary of selected demographic and socioeconomic conditions for the communities that would be affected by the Projects. The largest industry group in the area is educational services, health care and social assistance, which is the top industry in 20 of the 27 counties for the Rover Project, 4 of the 8 counties for the Panhandle Project, and 2 of the 5 counties for the Trunkline Project (U.S. Census Bureau, 2015a). The leading industry in all of the other counties is manufacturing. Other major industries include:

- agriculture, forestry, fishing and hunting, and mining;

- construction;
- retail trade;
- professional, scientific, and management, and administrative and waste management services;
- arts, entertainment, and recreation, and accommodation and food services; and
- transportation and warehousing, and utilities.

TABLE 4.9.1-1

Existing Economic Conditions for the Area Surrounding the Projects

Project/State/ County	2014 Population a	Population Density (Persons/ sq. mi.) a	Per Capita Income (2009-2013) a	Unemployment Rate for February 2015 (percent) b, c	Civilian Workforce b, c	Top Three Industries d, e
ROVER PIPELINE PROJECT						
West Virginia	**1,850,326**	**77.0**	**$22,966**	**7.6**	**769,899**	**A, B, C**
Doddridge	8,391	26.2	$17,334	6.5	3,636	A, B, D
Hancock	30,112	364.5	$23,261	8.7	12,864	A, E, C
Marshall	32,416	106.1	$24,329	9.1	14,057	A, B, C
Tyler	9,098	35.5	$20,704	10.9	3,611	A, E, B
Wetzel	15,988	44.7	$21,653	11.6	7,007	A, F, B
Pennsylvania	**12,787,209**	**285.8**	**$28,502**	**5.7**	**6,333,541**	**A, E, B**
Washington	208,187	242.9	$28,433	6.0	104,573	A, B, E
Ohio	**11,594,163**	**283.7**	**$26,046**	**5.6**	**5,679,296**	**A, E, B**
Ashland	53,035	125.4	$21,940	6.1	25,377	A, E, B
Belmont	69,461	130.5	$22,380	6.5	31,534	A, B, C
Carroll	28,187	71.4	$21,783	6.3	13,591	E, A, B
Crawford	42,480	105.7	$21,478	6.6	19,214	E, A, B
Defiance	38,510	93.6	$22,739	5.3	18,609	E, A, B
Fulton	42,580	105.0	$24,771	6.1	22,160	A, E, B
Hancock	75,337	141.8	$26,139	4.0	40,455	E, A, B
Harrison	15,543	38.6	$21,029	6.7	7,367	A, B, E
Henry	27,937	67.2	$23,347	7.2	13,514	E, A, B
Jefferson	67,694	165.8	$22,324	8.1	29,544	A, B, E
Monroe	14,465	31.7	$21,487	10.0	5,785	A, B, F
Noble	14,363	36.1	$18,853	7.8	4,868	A, E, B
Richland	121,942	246.2	$21,932	6.2	54,366	A, E, B
Seneca	55,669	101.0	$22,075	5.7	26,841	E, A, B
Stark	375,736	653.1	$24,453	5.7	186,780	A, E, B
Tuscarawas	92,788	163.5	$21,966	6.1	44,962	E, A, B
Wayne	115,537	208.2	$23,061	4.3	60,078	A, E, B
Wood	129,590	210.0	$26,326	5.0	67,901	A, E, B

TABLE 4.9.1-1 (continued)

Existing Economic Conditions for the Area Surrounding the Projects

Project/State/ County	2014 Population a	Population Density (Persons/ sq. mi.) a	Per Capita Income (2009-2013) a	Unemployment Rate for February 2015 (percent) b, c	Civilian Workforce b, c	Top Three Industries d, e
Michigan	**9,909,877**	**175.3**	**$25,681**	**5.8**	**4,698,260**	**A, E, B**
Lenawee	99,047	132.1	$22,395	5.3	47,756	A, E, B
Livingston	185,596	328.3	$32,129	5.2	93,219	A, E, B
Washtenaw	356,874	505.5	$33,231	3.4	186,738	A, G, E
PANHANDLE BACKHAUL PROJECT						
Illinois	**12,880,580**	**232.0**	**$29,666**	**6.5**	**6,435,217**	**A, E, G**
Douglas	19,889	47.7	$23,732	5.2	9,576	E, A, B
Indiana	**6,596,855**	**184.1**	**$24,635**	**6.1**	**3,220,205**	**A, E, B**
Allen	365,918	556.7	$25,279	5.9	172,769	A, E, B
Hamilton	302,623	767.6	$39,521	4.1	158,007	A, G, E
Marion	934,243	2,357.4	$24,124	6.3	463,043	A, G, E
Parke	17,233	38.8	$20,534	7.9	6,910	E, A, B
Vermillion	15,693	61.1	$22,875	9.3	7,265	E, A, B
Michigan	**9,909,877**	**175.3**	**$25,681**	**5.8**	**4,698,260**	**A, E, R**
Lenawee	99,047	132.1	$22,395	5.3	47,756	A, E, R
Ohio	**11,594,163**	**283.7**	**$26,046**	**5.6**	**5,679,296**	**A, E, R**
Defiance	38,510	93.6	$22,739	5.3	18,609	E, A, B
TRUNKLINE BACKHAUL PROJECT						
Illinois	**12,880,580**	**232.0**	**$29,666**	**6.5**	**6,435,217**	**A, E, G**
Douglas	19,889	47.7	$23,732	5.2	9,576	E, A, B
Massac	14,905	62.8	$22,047	7.1	6,141	A, B, H
Wayne	16,543	23.2	$22,526	6.9	7,326	E, A, B
Mississippi	**2,994,079**	**63.8**	**$20,618**	**6.8**	**1,228,141**	**A, E, B**
Tate	28,204	69.7	$20,431	8.1	11,746	A, B, H
Tennessee	**6,549,352**	**158.8**	**$24,409**	**6.3**	**3,021,895**	**A, E, B**
Dyer	37,935	74.0	$21,208	7.8	16,714	E, A, B

a U.S. Census Bureau, 2015b
b Bureau of Labor Statistics, 2015a
c Bureau of Labor Statistics, 2015b
d U.S. Census Bureau, 2015a
e Industry Key:
A = Educational services, and health care and social assistance
B = Retail trade
C = Arts, entertainment, and recreation, and accommodation and food services
D = Agriculture, forestry, fishing and hunting, and mining
E = Manufacturing
F = Construction
G = Professional, scientific, and management, and administrative and waste management services
H = Transportation and warehousing, and utilities

The populations of the counties in the Projects' area(s) range from a high of 934,243 in Marion County, Indiana, to a low of 8,391 in Doddridge County, West Virginia (U.S. Census Bureau, 2015b). The highest population density is 2,357.4 people per square mile in Marion County, Indiana, and the lowest population density is in Wayne County, Illinois, at 23.2 people per square mile. The largest civilian workforce is 463,043 in Marion County, Indiana, and the smallest is 3,611 in Tyler County, West Virginia (Bureau of Labor Statistics, 2015a). Washtenaw County, Michigan, has the lowest unemployment rate at 3.4 percent. The highest unemployment rate in the area is 11.6 percent in Wetzel County, West Virginia. Per capita incomes range from $39,521 in Hamilton County, Indiana, to $17,334 in Doddridge County, West Virginia.

Construction of the Projects would temporarily increase the population in the surrounding areas. Table 4.9.1-2 lists the size of the estimated average construction workforce and estimated peak construction workforce for the various components of the Rover Project. The Supply Laterals and Mainlines A and B are expected to take 1 year to construct while the Market Segment would take 1.5 years. Rover has estimated that the average workforce would be 9,998 workers over the first year of construction and 1,313 workers over the final 6 months of construction. The estimated peak construction workforce would be roughly 14,225 workers during the second and third quarters of the first year of construction.

TABLE 4.9.1-2

Estimated Workforce for the Rover Pipeline Project

Project Facility	Length (miles)	State	Counties	Average Workforce	Peak Workforce
PIPELINES					
Berne Lateral	3.7	OH	Monroe, Noble	105	150
Burgettstown Lateral	51.3	PA	Washington	525	700
		WV	Hancock		
		OH	Jefferson, Carroll		
Cadiz Lateral	2.9	OH	Harrison	105	150
Clarington Lateral	32.6	OH	Monroe, Belmont, Harrison	225	300
CGT Lateral	5.7	WV	Doddridge	50	75
Mainlines A and B	190.6	OH	Carroll, Tuscarawas, Stark, Wayne, Ashland, Richland, Crawford, Seneca, Hancock, Wood, Henry, Defiance	2,625	3,750
Majorsville Lateral	23.9	WV	Marshall	350	500
		OH	Belmont		
Market Segment	100	OH	Defiance, Henry, Fulton	1,200	1,500
		MI	Lenawee, Washtenaw, Livingston		
Seneca Lateral	25.6	OH	Monroe, Noble	225	300
Sherwood Lateral	54	WV	Doddridge, Tyler, Wetzel	525	700
		OH	Monroe		
Supply Connector Lines A and B	18.8	OH	Harrison, Carroll	525	750

TABLE 4.9.1-2 (continued)

Estimated Workforce for the Rover Pipeline Project

Project Facility	Length (miles)	State	Counties	Average Workforce	Peak Workforce
ABOVEGROUND FACILITIES					
Burgettstown Compressor Station	--	PA	Washington	156	250
Cadiz Compressor Station	--	OH	Harrison	156	250
Clarington Compressor Station	--	OH	Monroe	156	250
Defiance Compressor Station	--	OH	Defiance	196	250
Mainline Compressor Station 1	--	OH	Carroll	169	250
Mainline Compressor Station 2	--	OH	Wayne	169	250
Mainline Compressor Station 3	--	OH	Crawford	169	250
Majorsville Compressor Station	--	WV	Marshall	156	250
Seneca Compressor Station	--	OH	Noble	156	250
Sherwood Compressor Station	--	WV	Doddridge	156	250
Edgerton	--	IN	Allen	40	40
Montezuma	--	IN	Parke	40	40
Tuscola	--	IL	Douglas	40	40
Zionsville	--	IN	Marion	40	40
Dyersburg	--	TN	Dyer	40	40
Independence	--	MS	Tate	40	40
Johnsonville	--	IL	Wayne	40	40
Joppa	--	IL	Massac	40	40
METER STATIONS					
ANR Delivery	--	OH	Defiance	90	150
Berne Receipt	--	OH	Monroe	90	150
Burgettstown Receipt	--	PA	Washington	90	150
Cadiz Station	--	OH	Harrison	90	150
CGT Delivery	--	WV	Doddridge	90	150
Clarington Station	--	OH	Monroe	90	150
Consumer Energy Delivery	--	MI	Washtenaw	90	150
Gulfport Receipt	--	OH	Monroe	90	150
Hall Receipt	--	OH	Monroe	90	150
Majorsville Receipt	--	WV	Marshall	90	150
PEPL Delivery	--	OH	Defiance	90	150
REX Delivery	--	OH	Noble	90	150
Seneca Receipt	--	OH	Noble	90	150
Sherwood Receipt	--	WV	Doddridge	90	150
Vector Delivery	--	MI	Livingston	90	150
Edgerton 10 Gate	--	MI	Lenawee	40	40
Tuscola 6 Gate/Mainline Scrubber	--	IN	Vermillion	40	40
Zionsville 3 Gate	--	IN	Hamilton	40	40

TABLE 4.9.1-2 (continued)					
Estimated Workforce for the Rover Pipeline Project					
Project Facility	**Length (miles)**	**State**	**Counties**	**Average Workforce**	**Peak Workforce**
Bourbon Meter Station	--	IL	Douglas	40	40
INTERCONNECT SITES					
Panhandle-Rover Interconnect	--	OH	Defiance	40	40
Panhandle-Trunkline Interconnect	--	IN	Vermillion	40	40

Rover anticipates that half of its construction workforce would be contracted with local union labor workers who have the required experience for the installation of natural gas facilities. Therefore, the remaining 50 percent of the workforce would be non-local workers who would relocate to the area. The increase in population from the 7,113 non-local workers relocating to the Rover Project area would amount to 0.6 percent of the total population of all of the counties crossed by the Rover Project. The influx may be higher if non-local workers relocate with their families. The U.S. Census Bureau (2015b) estimates that the number of persons per U.S. household is 2.63 persons, which means the population in the Rover Project area could increase by as many as 18,707 people during construction. Given the population of the counties that would be crossed by Rover Project (totaling 1,146,407) and distribution of the construction workforce, the addition of about 18,700 people would not be a significant change.

The expected 7,112 direct local hires would increase employment in the area and could temporarily lower unemployment rates although this would be a minor change due to the size of the overall workforce in the area. Workers that are hired from outside the area would further stimulate the local economies as they pay for goods and services, such as lodging and food. In turn, these purchases could induce a number of temporary indirect jobs in the associated industries (e.g., restaurants, retail, lodging, gasoline, and entertainment). This stimulus would further increase employment in the counties.

Smaller impacts are expected as a result of the Panhandle and Trunkline Projects. The estimated peak workforce for these Projects would be 40 workers per Project facility, with 25 percent of the workforce being local. If all facilities were simultaneously at their maximum estimated workforce of 40 workers, the result would be 320 workers across the 8 Panhandle Project facilities and 240 workers across the 6 Trunkline Project facilities. As these facilities are spread across 12 counties in 6 states, this would represent a negligible increase in the population in the area of the Projects.

Population impacts due to construction of the Projects are expected to be temporary and minor in the area. Impacts on employment during construction would be beneficial but temporary as well. During operation, the Rover Project would require 38 additional permanent employees. These jobs would be dispersed across the Project areas (see table 4.9.1-3) and as such they would have minimal permanent impacts on population and employment. The Panhandle and Trunkline Projects would not require any new permanent staff for operation of the facilities.

TABLE 4.9.1-3 **Operation Workforce for the Rover Project**		
County/State	**Facility**	**Number of Permanent Employees**
Doddridge, West Virginia	Sherwood Compressor Station	1
Monroe, Ohio	Clarington Compressor Station	5
Stark, Ohio	Area Office	3
Carroll, Ohio	Mainline Compressor Station 1	4
Wayne, Ohio	Mainline Compressor Station 2	9
Crawford, Ohio	Mainline Compressor Station 3	5
Defiance, Ohio	Defiance Compressor Station	2
Livingston County, Michigan	Unknown	9
TOTAL		**38**

4.9.2 Housing

Housing statistics for the counties affected by the Projects are presented in table 4.9.2-1. According to the U.S. Census Bureau (2015c) the number of vacant housing units in counties surrounding components of the Projects ranged from a high of 51,686 in Hamilton County, Indiana, to a low of 670 in Douglas County, Illinois. Rental vacancy rates varied from zero percent in Carroll County, Ohio, to 11.4 percent in both Wetzel County, West Virginia and Allen County, Indiana. Additionally, there are over 1,000 hotels in the counties that would be crossed by the Project (Hotels Motels, 2015).

TABLE 4.9.2-1 **Housing Statistics by County in the Vicinity of the Projects**						
Project/ State/ County	**Total Housing Units a**	**Vacant Housing Units a**	**Vacant - For Rent a**	**Vacant - For Seasonal or Occasional Use a**	**Rental Vacancy Rate (Percent) b**	**Number of Hotels/ Motels c**
ROVER PIPELINE PROJECT						
West Virginia	**881,917**	**118,086**	**19,521**	**38,283**	**7.8**	**N/A**
Doddridge	3,946	847	27	426	1.6	0
Hancock	14,541	1,244	428	78	8.7	10
Marshall	15,918	2,049	434	507	5.9	6
Tyler	5,000	1,142	66	663	5.5	1
Wetzel	8,173	1,205	183	442	11.4	8
Pennsylvania	**5,567,315**	**548,411**	**135,262**	**161,582**	**6.1**	**N/A**
Washington	92,977	7,888	2,002	544	5.6	69
Ohio	**5,127,508**	**524,073**	**184,143**	**58,591**	**7.8**	**N/A**
Ashland	22,141	1,945	500	413	5.7	27
Belmont	32,452	3,773	717	694	6.0	23
Carroll	13,698	2,313	262	1,405	0.0	4
Crawford	20,167	2,068	631	90	5.2	13
Defiance	16,729	1,461	378	108	7.0	10

TABLE 4.9.2-1 (continued)

Housing Statistics by County in the Vicinity of the Projects

Project/ State/ County	Total Housing Units a	Vacant Housing Units a	Vacant - For Rent a	Vacant - For Seasonal or Occasional Use a	Rental Vacancy Rate (Percent) b	Number of Hotels/ Motels c
Fulton	17,407	1,219	349	112	7.0	12
Hancock	33,174	2,977	1,188	161	8.4	22
Harrison	8,170	1,644	126	779	2.8	5
Henry	11,963	1,029	223	66	3.1	7
Jefferson	32,826	3,717	816	253	2.5	10
Monroe	7,567	1,502	134	686	10.4	4
Noble	6,053	1,201	79	763	2.9	3
Richland	54,599	5,678	2,282	405	5.3	42
Seneca	24,122	2,348	810	121	8.5	12
Stark	165,215	14,126	4,993	726	6.8	69
Tuscarawas	40,206	3,241	979	449	7.1	44
Wayne	45,847	3,209	1,224	244	4.1	24
Wood	53,376	4,333	1,992	329	6.6	45
Michigan	**4,532,233**	**659,725**	**141,687**	**263,071**	**7.8**	**N/A**
Lenawee	43,452	5,938	1,144	2,414	5.0	28
Livingston	72,809	5,429	1,028	1,799	5.5	32
Washtenaw	147,573	10,380	4,513	1,403	4.9	93
PANHANDLE BACKHAUL PROJECT						
Illinois	**5,296,715**	**459,743**	**158,882**	**47,289**	**7.0**	**N/A**
Douglas	8,390	670	138	49	5.2	17
Indiana	**2,795,541**	**293,387**	**93,029**	**45,571**	**8.4**	**N/A**
Allen	152,184	14,333	6,038	753	11.4	90
Hamilton	106,772	6,937	2,549	817	7.7	46
Marion	417,862	51,686	22,922	1,496	9.5	338
Parke	8,085	1,863	160	1,100	2.1	13
Vermillion	7,488	869	174	74	9.5	4
Michigan	**4,532,233**	**659,725**	**141,687**	**263,071**	**7.8**	**N/A**
Lenawee	43,452	5,938	1,144	2,414	5.0	28
Ohio	**5,127,508**	**524,073**	**184,143**	**58,591**	**7.8**	**N/A**
Defiance	16,729	1,461	378	108	7.0	10
TRUNKLINE BACKHAUL PROJECT						
Illinois	**5,296,715**	**459,743**	**158,882**	**47,289**	**7.0**	**N/A**
Douglas	8,390	670	138	49	5.2	17
Massac	7,113	751	126	91	7.7	17
Wayne	7,975	873	138	134	7.6	2
Mississippi	**1,274,719**	**158,951**	**44,735**	**28,867**	**11.1**	**N/A**
Tate	10,947	912	237	115	10.5	3

TABLE 4.9.2-1 (continued)

Housing Statistics by County in the Vicinity of the Projects

Project/ State/ County	Total Housing Units a	Vacant Housing Units a	Vacant - For Rent a	Vacant - For Seasonal or Occasional Use a	Rental Vacancy Rate (Percent) b	Number of Hotels/ Motels c
Tennessee	**2,812,133**	**318,581**	**98,370**	**60,778**	**8.9**	**N/A**
Dyer	16,703	1,520	555	100	5.1	13

a U.S. Census Bureau, 2015c
b U.S. Census Bureau, 2015a
c Hotels Motels, 2015

Temporary housing availability varies seasonally and geographically within the counties and communities near the Projects. The demand for temporary housing in the area of the Projects is generally greatest during the summer months when tourism is at its highest. Temporary housing is available in the form of daily, weekly, and monthly rentals in motels and hotels. Table 4.9.2-1 provides the approximate number of hotels/motels in the counties crossed by the Projects. Other available temporary housing such as bed and breakfast facilities, apartments, and vacation properties available in these or neighboring counties within commuting distance of work areas are not included. Therefore, the actual availability of temporary housing is likely greater than presented in table 4.9.2-1.

The influx of construction workers in the Project area would increase the demand for housing. An analysis of the vacant housing in counties that would be crossed by the Projects shows that construction of the Projects could temporarily decrease the availability of housing in the area. Vacant housing units reported by the U.S Census Bureau (2015c) include units that are: for rent; rented but not occupied; for sale; sold but not occupied; for seasonal, recreational, or occasional use; for migratory workers; and other vacant units. Our analysis focusses on the units that are not only vacant but that are also available for rent. In counties that would be crossed by the Rover Project, there are 93,906 vacant housing units, 27,508 of which are available for rent. In the counties where the Panhandle and Trunkline Project facilities would be located, there are 87,813 vacant housing units, of which 35,559 are for rent. Assuming that the local construction workers do not require housing, a total of 7,113 housing units for the non-local Rover workforce, 240 housing units for the Panhandle workforce, and 180 housing units for the Trunkline workforce may be required during peak construction activities. Given the number of vacant housing units in the counties that would be affected by the Projects (174,320 in total) and the number of vacant housing units available for rent (60,545 in total), construction crews should not encounter difficulty in finding temporary housing. At a maximum, the workforce would utilize 4.3 percent of the vacant housing units and 12.4 percent of the vacant housing that are available for rent. While some of the construction activity would likely be conducted during the peak tourism season, sufficient temporary housing is still likely to be available but may be more difficult to find and/or more expensive to secure. Other than rental units, additional housing options for construction workers (as well as tourists) include hotels, motels, campgrounds, bed and breakfast lodges, and inns. The Projects could have a short-term positive impact on the area rental industry through increased demand and higher rates of occupancy; however, no significant impacts on the local housing markets are expected.

The estimated 38 new permanent employees required for operation of the Rover Project would have no measureable impact on housing stocks in the Project area. As the Panhandle and Trunkline Projects would not require any new permanent staff, there would be no permanent impacts.

4.9.3 Public Services

A wide range of public services and facilities are present in the Projects' area(s) including full-service law enforcement, paid and volunteer fire departments, schools, and hospitals. Table 4.9.3-1 provides an overview of selected public services available in the vicinity of the Projects.

TABLE 4.9.3-1

Public Service Infrastructure for the Projects

Project/State/ County	Number of Fire Departments and EMS a	Number of Police Departments b	Number of School Districts c	Total Students Enrolled c	Number of Hospitals d	Hospital Beds d
ROVER PIPELINE PROJECT						
West Virginia						
Doddridge	5	2	1	1,161	0	0
Hancock	7	5	1	4,202	1	195
Marshall	13	6	1	4,691	1	99
Tyler	4	4	1	1,373	0	0
Wetzel	10	4	1	2,818	1	48
Pennsylvania						
Washington	42	20	17	28,514	4	564
Ohio						
Ashland	10	5	8	8,706	1	49
Belmont	23	11	8	8,560	2	178
Carroll	11	3	3	3,385	0	0
Crawford	11	5	6	6,692	0	0
Defiance	10	3	5	6,370	1	27
Fulton	7	6	8	7,651	1	37 e
Hancock	10	3	12	13,833	1	150
Harrison	11	3	2	1,585	0	0
Henry	8	3	5	4,455	0	0
Jefferson	24	17	7	9,233	2	312
Monroe	6	2	1	2,481	0	0
Noble	3	2	2	1,679	0	0
Richland	13	8	17	16,496	1	224
Seneca	10	9	9	5,873	1	51
Stark	29	20	26	57,760	4	1,166
Tuscarawas	18	14	12	15,949	1	154
Wayne	18	14	14	15,703	1	147
Wood	21	12	11	16,801	1	102

TABLE 4.9.3-1 (continued) **Public Service Infrastructure for the Projects**						
Project/State/ County	**Number of Fire Departments and EMS a**	**Number of Police Departments b**	**Number of School Districts c**	**Total Students Enrolled c**	**Number of Hospitals d**	**Hospital Beds d**
Michigan						
Lenawee	17	8	12	16,140	1	88
Livingston	8	7	11	29,448	2	154
Washtenaw	13	8	19	41,919	6	1,611
PANHANDLE BACKHAUL PROJECT						
Illinois						
Douglas	7	7	4	3,303	0	0
Indiana						
Allen	14	4	7	53,849	7	1,414
Hamilton	9	8	10	56,050	5	462
Marion	15	11	47	148,657	16	3,653
Parke	7	3	2	967	0	0
Vermillion	8	2	3	2,585	0	0
Michigan						
Lenawee	17	8	12	16,140	1	88
Ohio						
Defiance	10	3	5	6,370	1	27
TRUNKLINE BACKHAUL PROJECT						
Illinois						
Douglas	7	7	4	3,303	0	0
Massac	3	3	2	2,479	0	0
Wayne	5	2	7	2,569	0	0
Mississippi						
Tate	5	4	2	4,806	1	41
Tennessee						
Dyer	8	3	2	6,821	1	95

a U.S. Fire Administration, 2015
b USA Cops, 2015
c National Center for Education Statistics, 2015
d American Hospital Directory, 2015
e Bryan Hospital in Williams County and Archbold Hospital in Fulton County report 75 beds combined.

Based on the number of police and fire departments, schools, and hospitals, there appears to be adequate public service infrastructure in the vicinity to accommodate the temporary needs of the Projects. The number of fire departments ranges from a low of 3 in Noble County, Ohio and Massac County, Illinois, to a high of 42 in Washington County, Pennsylvania. All of the counties surrounding the Projects have a minimum of two police departments. The number of students enrolled in the counties ranges from

967 in Parke County, Indiana to 148,657 in Marion County, Indiana. There are approximately 63 hospitals in the counties that would be crossed by the Projects.

Rover stated that construction contractors would typically have medical personnel at construction sites to respond to minor injuries and provide first aid to construction workers. Other measures that would reduce some of the additional impacts on local services include the use of water trucks and fire watch workers at construction sites and the use of private security guards at locations where equipment and materials would be stored.

In the event of an emergency, Rover could require police, fire, and/or medical services depending on the type of emergency; however, the anticipated demand for these services is not expected to exceed the existing capabilities of the emergency service infrastructure. Rover also has contracts for emergency response contractors, spill response contractors, and other construction services contractors that may be used during an emergency. Further details on Rover's Emergency Response Plan are contained in section 4.12.

Short-term impacts on certain other public services are possible, which would include the need for either localized police assistance or certified flaggers to control traffic flow during construction activities. Additional discussion of traffic and public service assistance necessary to support traffic controls is provided in section 4.9.4.

Given the existing population of the Rover Project area, the addition of the 38 new permanent employees for operation of the Rover Project would not have an impact on public services.

4.9.4 Transportation and Traffic

The Projects have the potential to affect traffic and transportation in the surrounding areas. During construction, roadways would have increased traffic as materials and equipment are delivered to the Project locations and as workers commute to and from work. Where the pipeline portions of the Rover Project cross roadways and railroads, there could be additional impacts due to temporary road closures and detours on the roadways.

4.9.4.1 Use of the Roadways during Construction

The Rover Project would have a peak workforce of approximately 14,225 workers. These workers would be spread across the Project area along 15 different pipeline construction spreads with 1 spread at each of the 10 compressor stations. The movement of construction materials, equipment, and workers across roads in the Project area would potentially create congestion on local roads.

Having the workers spread over large distances would help to mitigate traffic impacts associated with worker commutes at any one location. Additionally, construction shifts would typically begin before peak morning commute times and would end after peak evening commute times, further reducing potential impacts. Any traffic impacts from construction of the pipeline that would occur would be minor and temporary due to the linear nature of pipeline construction. The peak workforce at each of the compressor stations would be 250 workers. This may result in a temporary increase in traffic in the areas of the compressor stations; however, this increase is expected to result in only minor impacts on traffic flow.

Rover would require its contractors to adhere to vehicle weight restrictions and limitations imposed by the road's managing authority. Rover would use a stone pad in areas where the right-of-way would be accessed from paved roads to minimize vehicles tracking dirt onto paved roads. Damage to public and private roadways that occur due to construction activities would be repaired by Rover.

During our review of Rover's application, we identified locations where additional temporary workspace was depicted in roadways. In response to our comments on this matter, Rover filed updated alignment sheets. We found these updates to be acceptable, with the exception of the HDD exit pit near MP MAB 69.2 which was depicted on the alignment sheets as encumbering Balford Road. In response to our request in the draft EIS, Rover filed adjusted alignment sheets[5] that now show the workspace stopping at the edge of Balford Road. We find this update to be acceptable.

During construction of the Panhandle and the Trunkline Projects, no more than 40 workers would be expected at any one location. Start and end times for shifts would typically be early in the morning and in the evenings, outside of typical peak commute times. Therefore, impacts on motorists and roadways associated with these Projects are expected to be minor and temporary for these Projects.

4.9.4.2 Construction across and within Roadways and Railroads

The Rover Project would cross 628 roadways and 35 rail lines. Impacts would be minimized at crossings of major roads and railroads by using horizontal bore or HDD crossing methods. Both of these methods leave the road or railroad surface intact while passing underneath (see section 2.3.2). Where feasible, Rover is proposing the use of one bore or one HDD to cross multiple roadways and/or rail lines.

At open-cut road crossings, Rover would provide 2 weeks advance notice to residents and local authorities. Rover would establish detours and comply with all permit requirements during construction. In the event that a detour is not possible, steel plates would be maintained at the construction site to allow the open trench to be covered quickly to allow for vehicular travel in the case of an emergency. Open-cut crossings would result in temporary road closures of approximately 4 to 6 hours while the trench is excavated and the pipe is installed. Rover has committed to return all roadways to a condition as good as or better than they were before construction.

Rover has submitted a Residential Access and Traffic Management Plan (Rover's Traffic Plan, see appendix G) that further outlines the mitigation measures Rover would take to alleviate traffic and transportation impacts. The plan contains details regarding:

- crossing methods for construction of pipelines across roadways;
- emergency access response management, which includes establishing temporary travel lanes and the staging of steel plate bridges on-site to place over the open trench in the event that emergency vehicles would need to use the roadway;
- a 2-week advance public notification communication plan to open-cut road crossing construction to include the location of road closures;
- mitigation efforts for utilization of roadways during construction;
- responsibilities for road repair after construction; and
- typical drawings of temporary traffic control measures for each state crossed by the Project, including signage, barricades, and flagmen.

We find Rover's Traffic Plan to be acceptable as it would reduce impacts on traffic flow. Based on the mitigation measures listed above, we expect the impacts from construction across and within roadways to be minor and temporary.

---

[5] Filing on March 25, 2016; Accession No. 20160325-5213.

During operation of the Rover Project, the additional 38 workers that would be required across 3 states would have a negligible impact on traffic.

Construction of the Panhandle and Trunkline Projects would not require the crossing of any roadways or railroads.

4.9.5 Property Values and Mortgages

We received comments regarding the potential effect of the Rover Project on property values. Specific issues mentioned include: devaluation of property if encumbered by a pipeline easement; being the responsible party for property taxes within a pipeline easement; paying increased landowner insurance premiums for Project-related effects; and negative economic effects resulting from changes in land use (e.g. loss of timber production within the permanent right-of-way). Rover would acquire easements for both the temporary (construction) and permanent rights-of-way and compensate landowners for the easements, the limited use during construction, and any construction-related damages. As discussed in section 4.8.2, the compensation for easements is negotiated between an applicant and affected landowners. If the Commission approves a project and an agreement cannot be reached, the fair market value of the easement would be determined through eminent domain proceedings in a federal, state, or local court. The FERC is not involved in the individual easement negotiations or eminent domain proceedings, and this section is not intended as guidance for those negotiations or court proceedings.

We also received comments regarding economic impacts of the Projects on agriculture, timber production, and specialty crops. Construction of the Rover Project would affect about 5,328 acres of agricultural land, as discussed in section 4.8.4. Rover would compensate landowners for any crop damage or measureable loss of production resulting from construction of the Rover Project. Following construction, Rover would continue to monitor affected agricultural areas to verify crop yields from the affected areas and return to produce similar yields to those of adjacent undisturbed areas of the same field. Rover would work with landowners to avoid or minimize impacts on specialty crops, such as Christmas tree farms (see section 4.8).

Approximately 3,000 acres of forested land would be affected during construction of the Rover Project. Rover has retained appraisers to help determine property values and fair market value. Landowners would be compensated for any marketable timber that is removed from their property during construction. Impacts on forest and agricultural lands are discussed in sections 4.5 and 4.8.

Land values are determined by appraisals, which take into account objective characteristics of the property such as size, location, and any improvements. The potential impact of a pipeline on the value of a tract of land would be related to many tract-specific variables, including the size of the tract, the current value of the land, the utilities and services available or accessible, the current land use, and the values of the adjacent properties. However, subjective valuation is generally not considered in appraisals. That is not to say that the presence of a pipeline, and the restrictions associated with a pipeline easement could not influence a potential buyer's decision to purchase a property. If a buyer is looking for a property for a specific use, which the presence of the pipeline renders infeasible, then the buyer may decide to purchase another property more suitable to their objectives. For example, a buyer wanting to develop the land for a commercial property with sub-surface structures would likely not find the property suitable, but a farmer looking for land for grazing or additional cropland could find it suitable for their needs. This would be similar to other buyer-specific preferences that not all homes have, such as close proximity to shopping, relative seclusion, or access to high quality school districts.

We previously conducted a literature review and found several studies that examined the effects of pipeline easements on sales and property values and evaluated the impact of natural gas pipelines on real estate (FERC, 2014). The first study (Diskin et al., 2011) looked at the effects of natural gas transmission pipelines on residential values in Arizona. The study concluded that there was no identifiable systematic relationship between proximity to a pipeline and residential sale price or value.

Studies conducted in 2008 by PGP Valuation Inc. (PGP, 2008) for Palomar Gas Transmission, Inc. and by ECONorthwest for the Oregon LNG Project reached similar conclusions. Both studies evaluated the potential effect on property values of a natural gas pipeline that was constructed in 2003/2004 in northwestern Oregon, including along the western edge of the Portland metropolitan area. The PGP study found that:

- there was no measurable long-term impact on property values resulting from natural gas pipelines for the particular pipeline project studied;
- interviews with buyers and brokers indicated no measurable impact on value or price; and
- there was no trend in the data to suggest an extension of marketing periods (i.e., time while the property is on sale) for properties with gas pipeline easements.

The ECONorthwest study concluded that the pipeline had no statistically significant or economically significant impact on residential properties. The study also concluded that there was no relationship between proximity to the pipeline and sale price (Fruits, 2008).

Another study (Hansen et al., 2006) analyzed property sales near a pipeline accident location in Washington State, using methodologies that considered proximity and persistence over time. This study noted a decline in property values following the incident. However, the effect was very localized, and declined as the distance from the affected pipeline increased. The effect also diminished over time in the years following the incident.

Some of the comments we received on the draft EIS regarding property values identified other research that concluded there could be impacts on property values due to the presence of gas transmission pipelines. One of the cited studies was conducted in Wisconsin (Peltier, 2002). This study used a telephone survey to ask participants about their willingness to buy a home/property with a pipeline present. The study found that 22.5 percent of respondents' willingness to buy a property would not be impacted, 18.7 percent of respondents would still buy the home with a reduced price, and 58.9 percent of respondents would not buy the home or property at any price. The comment also included a letter from a real estate appraiser who stated that his firm has found through opinion surveys and empirical studies that natural gas pipelines have a negative impact on residential and agricultural property value. One study cited was a survey of 88 realtors in Wisconsin in which "68 to 78 percent of the Realtors perceived that a pipeline would negatively impact the perception and value of the property." However, each of these studies were based on survey results and not on actual sales data. Our literature review focused on studies that used recorded real estate sales data. When given the choice between actual market behavior and hypothetical market behavior, the actual market behavior revealed in sales data is generally preferred.

We have conducted interviews and research for previous projects (FERC, 2014), including contacting several appraisers to inquire about the potential impacts on property values due to the presence of a natural gas pipeline. Michael Coles of Coles and Associates provided responses to questions regarding potential impacts on property values (Coles, 2013, 2014). Mr. Coles conducts appraisals and also teaches seminars for appraisers and realtors, including discussions of mineral rights and pipeline easements. According to Mr. Coles, "the empirical evidence indicates no difference in value attributable to the existence of the pipeline easement." Further, Mr. Coles was not aware of appraisers making adjustments in the appraisal reports for the existence of a pipeline easement. In addition, he stated that the large number of variables that impact home values make it difficult to determine the incremental effect that any one variable may have on a home's value. However, Mr. Coles did explain that perceived safety issues or the limitation on use of land within the permanent easement could reduce the number of potential buyers for a property, which may extend the number of days the property is on the market. Several other appraisers were contacted; however, they would not agree to be publicly cited.

We received a comment highlighting a trial in Texas in which the landowners were awarded $2.1 million (Peregrine Pipeline Company, L.P. v. Eagle Ford Land Partners, LP 2014). The landowners claimed that lands used for construction and associated with the permanent easement, which were taken through eminent domain in 2007, were not adequately compensated for and that damages, including a decrease in property value, occurred on the remainder of their properties. Of the $2.1 million awarded to the landowners, about $500,000 was associated with pre- and post-judgment interest and other "recoverable" costs, and $1.35 million was awarded for fair market value and damage to the remainder of the property. The fair market value awarded for lands directly impacted by the pipeline project was $282,590, which is substantially more than the $80,000 appraised value associated with condemnation. The FERC does not get involved in specific eminent domain cases, and input into court-directed compensation is not available. In the event that a landowner believed that they were not justly compensated by an eminent domain court, the landowner could appeal the compensation award, as occurred in the Texas case.

Based on the above literature review and interviews with appraisers, we found no consistent information correlating the presence of a natural gas pipeline easement with decreased property values (FERC, 2014). While opinion surveys referenced by commentors on the draft EIS do indicate a negative effect on property values, these studies used survey methods that are not preferable given the availability of real estate sales data. Given these factors, and in consideration of the numerous variables that can affect property value, we conclude that there is no sufficient evidence to demonstrate that the Rover Project would result in decreased property values overall or with respect to any given property.

We have also previously researched the concern raised that installation of the pipeline and the corresponding easement would hinder the ability of a prospective buyer to obtain a mortgage or have impacts on mortgage rates (FERC, 2014). Several national banks were contacted, including Wells Fargo, Citizens Bank, Bank of America, and Chase Bank. Representatives for these banks would not formally respond to questions and asked that correspondence not be cited in an EIS.

Lenders consider many factors when assessing whether or not to offer a mortgage for a property. Most of these are directly related to the lender's evaluation of the prospective borrower's ability to repay the loan. A property value assessment and appraisal is also taken into consideration. As discussed above, there is no conclusive evidence that the mere presence of a pipeline would negatively affect the value of a property. Therefore, an easement to affect a bank's appraisal of a property in its consideration of financing a loan is not expected. Furthermore, based on our experience in reviewing natural gas pipelines across the United States, we have never documented an instance where a FERC-jurisdictional pipeline project has affected the ability of a prospective buyer to obtain a mortgage. We, therefore, find these claims to be unlikely.

Moreover, in conjunction with determining the appropriate level of financing for an individual, banks use an appraisal process to value properties for which they are financing. As discussed above, the presence of a pipeline would not affect the value of a property; therefore, an appraisal to be impacted by a pipeline is not expected. Because the appraisal is the only factor that could possibly include the presence of an easement, it is concluded that the Rover Project would not have a marked effect on the ability of a prospective buyer to obtain a mortgage.

Impacts on property values are not anticipated for the Panhandle and Trunkline Projects as all construction activities for these Projects would occur at existing facilities which are on previously disturbed lands that are owned or leased by the applicants. Given the presence of the existing facilities, the proposed modifications would not result in a change to the type of use at these locations.

4.9.6 Insurance

We received comments on the Rover Project during scoping regarding the potential for insurance premium adjustments or loss of coverage associated with a pipeline easement on a residential property. Commenters noted concerns that either their property insurance coverage would be cancelled if a pipeline was installed on their property or that if they accepted compensation from the pipeline company, then their property would become uninsurable. Other commentors stated that their insurance premiums would rise to an unaffordable level if the pipeline was installed. In response to this issue being raised previously, we have conducted prior independent research on the matter (FERC, 2014).

The initial phase of the research involved calling insurance offices for a variety of agencies. We asked whether the presence of a utility crossing would change the terms of an existing or new residential insurance policy, which types of utilities may cause a change, how a policy might change, and what factors would influence a change in the policy terms, including the potential for a policy to be dropped completely. Results of this initial investigation suggested that the potential for a residential insurance policy to be affected could exist, but the extent of any action and corresponding corrective action would depend upon several factors including the terms of the individual landowner's policy and the terms of the pipeline operator's policy. Insurance company contacts were neither able to provide the potential factors that could cause a change in a policy (e.g., type of utility, proximity of the residence to the utility), nor provide quantitative information on the potential change in a policy premium (in dollars or percent).

The next phase of research involved identifying and writing to representatives from five major insurance companies (i.e., holding major market share in the United States). The goal of the written correspondence was to reach out to the corporate offices of insurance companies to obtain more definitive information on conditions under which a policy may be modified or dropped, specific factors used to evaluate the action, and what corrective action could be undertaken by the landowner or company to mitigate any change in a policy. The written correspondence included the questions posed in the calls to agents, a synopsis of our findings from conducting the calls, as well as follow-up questions seeking clarification on the plausibility of a change or dropped policy, details on potential corrective actions, and specific scenarios or quantitative information. Despite repeated attempts at follow-up, only one response was received and the contact stated that they could not provide the information that the FERC requested. This contact also shared our correspondence with the Insurance Information Institute, but they too were unwilling to assist.

As we have not been successful in confirming under what exclusive conditions a landowner's insurance policy could be changed as a result of a pipeline easement, and to mitigate for potential impacts, **we recommend that:**

- **Rover should file with the Secretary reports describing any documented complaints from affected landowners that a homeowner's insurance policy was either cancelled or voided due directly to the grant of the pipeline right-of-way or installation of the pipeline and/or that the premium for the homeowner's insurance increased materially and directly as a result of the grant of the pipeline right-of-way or installation of the pipeline. The reports should also identify how Rover has mitigated the impact. These reports should be included in Rover's weekly construction status reports and in its quarterly reports <u>for a 2-year period following in-service of the Rover Project</u>.**

Impacts on insurance are not anticipated for the Panhandle and Trunkline Projects as all construction activities for these Projects would occur at existing facilities, on previously disturbed lands that are owned or leased by the applicants. Given the presence of the existing facilities, the proposed modifications would not result in a change to the type of use at these locations.

4.9.7 Economy and Tax Revenues

Construction and operation of the Projects would have a beneficial impact on tax revenues in the area. Table 4.9.7-1 provides the estimated payroll, estimated payroll taxes, projected sales tax revenues, and annual property taxes associated with the construction of the Rover Project. Rover anticipates that its total payroll would be approximately $620 million during the construction phase ($10.56 million in Pennsylvania, $53.31 million in West Virginia, $495.54 million in Ohio, and $60.91 million in Michigan).

Construction of the Rover Project would have a short-term, beneficial effect in terms of increased payroll and local material purchases. Because about 50 percent of the workers are expected to be local, and non-local workers would temporarily relocate to the Rover Project area, a substantial portion of the payroll would likely be spent with local vendors and businesses. Rover is in the process of establishing contracts for construction of the Project so it cannot provide specific details on materials to be purchased from local vendors; however, Rover has currently contracted the purchase of $74.4 million in materials from local and regional manufacturers and suppliers. Rover expects that number would increase as it finishes bidding the construction phase of the Project. Construction of the Rover Project would also result in increased state and local sales tax revenues associated with the purchase of some construction materials, as well as goods and services, by the construction workforce.

We do not expect the Rover Project to have any long-term negative economic impact. The pipeline would be installed underground and any surface impacts, such as damaged roads, would be repaired. Once installed, the pipeline would not impede normal surface traffic or access to businesses, and most pre-construction property uses would be allowed. The long-term positive economic impacts from the proposed pipeline include an increase in annual property taxes paid by Rover to counties where the project components would be located. The estimates for these additional taxes range from $135 thousand per year in Wetzel County, West Virginia, to $13 million in Wayne County, Ohio. This increase in property taxes paid would benefit the local governments and their budgets annually for the life of the Rover Project. Rover would be responsible for any increase in valuation for property tax purposes resulting from operation of the pipeline Project. The landowner would not bear responsibility for increased property taxes resulting from installation or operation of the pipeline.

Table 4.9.7-2 summarizes the total capital investment, estimated state sales tax revenues, and the anticipated annual property taxes associated with the Panhandle and the Trunkline Projects. Panhandle expects to pay out over $6.3 million in wages during construction and Trunkline expects to pay out approximately $7.1 million. The estimated state sales taxes that would be paid due to worker spending and material purchases during construction are $199,464 for the Panhandle Project and just over $1 million for the Trunkline Project. These expenditures would have a short-term positive impact on the local economy.

Long-term negative impacts on the economy are not expected due to the construction of the Panhandle and Trunkline Projects as the land use types at its facilities would not change. Estimated increases in annual property taxes paid by the applicants are expected to total over $2 million for the Panhandle Project and $947,000 for the Trunkline Project, which would have minor long-term positive impacts on the local communities.

TABLE 4.9.7-1

Socioeconomic Impact Resulting from Construction and Operation of the Rover Pipeline Project

State/ County	Estimated Construction Payroll	Total Estimated Payroll Tax	Projected State Sales Tax	Annual Property Tax
Pennsylvania	**10,564,209**	**3,295,505**	**$939,138**	**$1,300,000**
Washington	10,564,209	3,295,505		$1,300,000
West Virginia	**53,314,959**	**16,802,209**	**$5,631,644**	**$3,942,151**
Doddridge	16,078,100	5,067,013		$1,015,953
Hancock	4,253,895	1,340,615		$359,257
Marshall	12,319,804	3,882,586		$821,861
Tyler	19,061,054	6,007,091		$1,609,776
Wetzel	1,602,105	504,903		$135,304
Ohio	**495,541,927**	**155,360,694**	**N/A**	**$135,589,512**
Ashland	26,657,348	8,357,525		$7,924,360
Belmont	28,276,402	8,865,126		$8,405,652
Carroll	29,465,244	9,237,848		$6,304,254
Crawford	33,911,979	10,631,974		$8,506,577
Defiance	15,568,258	4,880,910		$2,896,427
Fulton	13,825,195	4,334,430		$4,109,779
Hancock	9,006,911	2,823,817		$2,677,461
Harrison	37,395,720	11,724,185		$10,027,988
Henry	34,273,214	10,745,227		$10,188,308
Jefferson	16,208,996	5,081,792		$4,818,406
Monroe	45,506,474	14,267,042		$11,123,282
Noble	5,623,936	1,763,198		$780,729
Richland	28,343,899	8,886,287		$8,425,717
Seneca	37,941,362	11,895,252		$11,278,729
Stark	23,135,259	7,253,291		$6,877,358
Tuscarawas	23,486,514	7,363,416		$6,981,774
Wayne	50,357,512	15,787,924		$13,395,298
Wood	36,557,703	11,461,452		$10,867,412
Michigan	**60,905,422**	**18,105,157**	**$8,761,200**	**$6,070,260**
Lenawee	23,492,367	6,983,500		$2,429,380
Livingston	13,729,089	4,081,202		$1,280,140
Washtenaw	23,683,966	7,040,455		$2,360,740

N/A = The Rover Project would provide public utility service in Ohio, as such Rover would not be subject to sales tax in this state.

TABLE 4.9.7-2

Socioeconomic Impact Resulting from Construction and Operation of the Panhandle and Trunkline Backhaul Projects

Project/State/County	Total Capital Investment	Estimated State Sales Tax	Anticipated Annual Property Tax
PANHANDLE BACKHAUL PROJECT			
Illinois			
Douglas	$8,724,940	$170,576	$78,524
Indiana			
Allen	$12,915,361	N/A	$504,216
Hamilton	$2,626,519	N/A	$102,539
Marion	$15,985,829	N/A	$624,087
Parke	$8,703,749	N/A	$339,794
Vermillion	$1,100,000	N/A	$42,944
Michigan			
Lenawee	$1,539,163	$28,888	$136,986
Ohio			
Defiance	$3,409,100	N/A	$184,313
Totals	**$55,004,661**	**$199,464**	**$2,013,403**
TRUNKLINE BACKHAUL PROJECT			
Illinois			
Douglas	$10,431,727	$203,949	$93,886
Massac	$9,528,148	$186,279	$85,753
Wayne	$11,042,413	$215,883	$99,382
Mississippi			
Tate	$7,651,347	$226,963	$306,295
Tennessee			
Dyer	$10,365,299	$167,537	$361,756
Totals	**$49,018,934**	**$1,000,611**	**$947,072**

N/A = The Projects would provide public utility service in Ohio and Indiana and would not be subject to sales tax in those states.

4.9.8 Environmental Justice

Executive Order 12898 (EO 12898) on Environmental Justice recognizes the importance of using the NEPA process to identify and address, as appropriate, any disproportionately high and adverse health or environmental effects of federal programs, policies, and activities on minority populations and low-income populations. Consistent with EO 12898, the CEQ called on federal agencies to actively scrutinize the following issues with respect to environmental justice (CEQ, 1997a):

- the racial and economic composition of affected communities;

- health-related issues that may amplify project effects on minority or low-income individuals; and
- public participation strategies, including community or tribal participation in the process.

The EPA's Environmental Justice Policies focus on enhancing opportunities for residents to participate in decision-making. The EPA (2011b) states that Environmental Justice involves meaningful involvement so that: "(1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; (2) the public's contributions can influence the regulatory agency's decision; (3) the concerns of all participants involved will be considered in the decision-making process; and (4) the decision-makers seek out and facilitate the involvement of those potentially affected."

As the Panhandle and Trunkline Projects would be completely contained within land owned or leased by the applicants and the modifications would be at existing facilities, we do not expect any Environmental Justice concerns for these Projects, therefore the following discussion focuses on the Rover Project.

As discussed in section 1.3, there have been many opportunities for the public to comment on and provide input about the Projects. These included Rover holding a number of open houses for the affected communities and local authorities in the Project area. Rover also established a website and toll free phone number to share information with the public.

Rover also used the FERC's pre-filing process (see section 1.3). One of the major goals of this process is to increase public awareness and encourage public input regarding every aspect of a project before an application is filed. As part of this process, we participated in all of Rover's open houses to answer questions about the FERC process and to receive input from the public about the Project. Interested parties have had, and will continue to be given, opportunities to participate in the NEPA review process. To date, this included the opportunity to participate in FERC's public scoping meetings within the Rover Project area to identify concerns and issues that should be covered in the EIS and the opportunity to submit written comments to the FERC, and to comment on the draft EIS either electronically, in writing, or at the draft EIS comment meetings held within the Project area. All comments on the draft EIS were responded to in this final EIS.

Guidance from the CEQ states that "minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis" (CEQ, 1997a). Minority populations, defined as Hispanics, Asian-Americans and Pacific Islanders, African-Americans, and American Indians and Alaskan Natives persons, comprise less than 30 percent of the population in each of the counties that would be traversed by the Rover Project (those counties comprise the region of influence for the Projects) (see table 4.9.8-1). To further assess whether the minority population in the region of influence is substantially greater than the minority population in surrounding areas, we compared census tract-level demographics to the respective statewide proportions. The proportion of individual minority populations along the Rover Project are below statewide proportions. Specifically, 87 of the 89 tracts that make up the region of influence for the Rover Project have minority populations below their statewide proportions (see table 4.9.8-1). These statistics indicate that a disproportionate effect on minority populations is unlikely according to the guidance set forth by the CEQ.

TABLE 4.9.8-1

Demographic and Economic Conditions by Census Tract Crossed by the Rover Pipeline Project

Project Component	Census Tract	County	Pop.	Hispanic (percent)	White Non-Hispanic (percent)	Minorities (percent)	Poverty (percent)	Mean Household Income ($)
West Virginia	-	-	-	**1.4**	**92.7**	**7.3**	**17.9**	**41,043**
CGT Lateral	9650 **a**	Doddridge	3,575	1	97.7	2.3	13.3	36,458
Burgettstown Lateral	212 **b**	Hancock	3,437	0.1	99.2	0.8	21.2	39,479
	211	Hancock	3,723	1.6	95.5	4.5	11.4	43,000
Sherwood Lateral	9620 **b**	Tyler	2,079	0.1	99.4	0.6	25.6	33,828
	9618	Tyler	3,520	1.3	97.1	2.9	18	40,516
	9619 **b**	Tyler	3,521	0.3	98.9	1.1	17.1	41,082
	307 **b**	Wetzel	4,177	0.5	97.9	2.1	18.1	39,940
	9651	Doddridge	4,638	0.2	95.3	4.7	15.4	33,478
	9650	Doddridge	3,575	1	97.7	2.3	13.3	36,458
Majorsville Lateral	208 **a**	Marshall	4,931	0.8	98.9	1.1	16.5	43,169
	213	Marshall	4,394	1.1	96.4	3.6	10.6	54,342
	211	Marshall	5,395	0.3	96.7	3.3	15.8	37,181
	206.01 **b**	Marshall	1,961	0.2	99.3	0.7	21.8	32,708
Pennsylvania	-	-	-	**6.3**	**78.4**	**21.6**	**13.3**	**52,548**
Burgettstown Lateral	7137 **a**	Washington	4,463	0.3	99.6	0.4	11.5	48,913
	7110	Washington	4,028	1.3	97.2	2.8	10.2	55,391
Ohio	-	-	-	**3.4**	**80.5**	**19.5**	**15.8**	**48,308**
Berne Lateral	9667	Monroe	3,737	1.3	95.6	4.4	13.9	46,482
	9683 **a**	Noble	4,128	0	99.3	0.7	8.7	40,321
Burgettstown Lateral	7206	Carroll	3,597	2.6	95.1	4.9	13.5	41,131
	7207	Carroll	3,094	1.9	95.3	4.7	14	39,205
Burgettstown Lateral	111	Jefferson	3,323	0	97.5	2.5	14.9	39,068
	112 **b**	Jefferson	1,897	0.9	98.7	1.3	27.4	24,841
	114.01	Jefferson	4,396	0	97.5	2.5	12	50,665
	114.02	Jefferson	3,885	1.2	95.8	4.2	4.8	46,569
	115	Jefferson	4,908	1.1	98.2	1.8	6.3	50,579
Cadiz Lateral	9759	Harrison	2,574	0	100	0	14.3	42,205
	9760 **a**	Harrison	3,659	0.5	90.9	9.1	18.8	36,393

TABLE 4.9.8-1 (continued)

Demographic and Economic Conditions by Census Tract Crossed by the Rover Pipeline Project

Project Component	Census Tract	County	Pop.	Hispanic (percent)	White Non-Hispanic (percent)	Minorities (percent)	Poverty (percent)	Mean Household Income ($)
Clarington Lateral	106	Belmont	3,716	2.3	96.6	3.4	12.6	41,012
	110	Belmont	4,638	0.5	95	5	11.5	46,817
	112	Belmont	3,742	0.2	98.5	1.5	11.7	46,442
	122	Belmont	6,344	3.6	74.3	25.7	9.2	55,843
	9759	Harrison	2,574	0	100	0	14.3	42,205
	9760	Harrison	3,659	0.5	90.9	9.1	18.8	36,393
	9666 **a**	Monroe	3,373	0.3	98.6	1.4	14.8	42,148
Mainlines A and B	9706 **b**	Ashland	5,494	1.3	93.8	6.2	7.8	49,410
	9707 **b**	Ashland	5,440	0.7	95.4	4.6	8.6	62,952
	9708	Ashland	3,742	0.7	94.9	5.1	16	47,614
	9709	Ashland	4,900	0.6	97.5	2.5	7.3	49,120
	9710	Ashland	4,772	0.4	98.8	1.2	10.5	47,772
	7207 **a**	Carroll	3,094	1.9	95.3	4.7	14	39,205
	9741 **a**	Crawford	3,584	0.9	97.3	2.7	5.9	54,911
	9742	Crawford	4,266	0.8	99.1	0.9	8.2	57,359
Mainlines A and B	9581	Defiance	4,367	4.3	94	6	6.3	60,093
	1	Hancock	4,161	6.2	90.5	9.5	11.3	40,331
	2 **b**	Henry	3,509	2.6	95.9	4.1	1.2	66,573
	5 **b**	Henry	3,326	5	94.3	5.7	15.5	45,344
	7 **b**	Henry	4,245	14.6	84.7	15.3	14.3	48,648
	17	Richland	5,256	5.4	35	65	6.7	33,750
	25	Richland	4,225	0	99.8	0.2	11	48,500
	27	Richland	4,970	1.3	97.2	2.8	7.8	44,820
	29 **b**	Richland	4,533	1.1	98.8	1.2	15.3	53,329
	9631	Seneca	4,388	0.3	99.6	0.4	9	56,429
	9632	Seneca	4,110	2.9	96.2	3.8	21.7	31,957
	9637	Seneca	4,665	4.3	90.7	9.3	4.7	57,232
	9638	Seneca	4,071	1	97.7	2.3	9.8	46,506
	7148.01	Stark	6,526	1	97.1	2.9	8.7	47,089
	7148.02	Stark	2,814	0	98.7	1.3	11.2	45,075
	7149.01	Stark	3,958	0.4	97.7	2.3	7	52,629
	203	Tuscarawas	3,628	0	99.2	0.8	4.8	54,439
	204	Tuscarawas	5,453	0	98.8	1.2	15.1	48,480
	5	Wayne	3,836	5.9	86.4	13.6	18.9	35,295
	6	Wayne	5,837	0.8	95.9	4.1	15.5	41,875

TABLE 4.9.8-1 (continued)

Demographic and Economic Conditions by Census Tract Crossed by the Rover Pipeline Project

Project Component	Census Tract	County	Pop.	Hispanic (percent)	White Non-Hispanic (percent)	Minorities (percent)	Poverty (percent)	Mean Household Income ($)
	17	Wayne	7,502	3.1	96.6	3.4	13.3	51,094
	18	Wayne	3,865	0.3	99.6	0.4	6.8	56,295
Mainlines A and B	20 **a**	Wayne	3,101	0	97.2	2.8	8.7	60,151
	214	Wood	3,131	11.8	87.2	12.8	12.2	48,542
	222	Wood	2,414	4.4	92.1	7.9	23.1	45,114
	223 **b**	Wood	3,881	3.6	91.5	8.5	7.9	55,038
Majorsville Lateral	112	Belmont	3,742	0.2	98.5	1.5	11.7	46,442
	113	Belmont	3,975	0	98.4	1.6	9.3	43,051
	114 **b**	Belmont	4,483	0.4	99.6	0.4	15.6	41,437
	122	Belmont	6,344	3.6	74.3	25.7	9.2	55,843
Market Segment	9581 **a**	Defiance	4,367	4.3	94	6	6.3	60,093
	406	Fulton	4,550	7.5	91.8	8.2	9.9	46,797
	408	Fulton	4,854	5.5	92.4	7.6	13.2	50,504
	409	Fulton	4,519	16.3	82.7	17.3	14.7	47,957
	2	Henry	3,509	2.6	95.9	4.1	1.2	66,573
Seneca Lateral	9666	Monroe	3,373	0.3	98.6	1.4	14.8	42,148
	9667	Monroe	3,737	1.3	95.6	4.4	13.9	46,482
	9668	Monroe	3,866	0	98	2	16.8	34,090
	9683	Noble	4,128	0	99.3	0.7	8.7	40,321
Sherwood Lateral	9666	Monroe	3,373	0.3	98.6	1.4	14.8	42,148
	9667	Monroe	3,737	1.3	95.6	4.4	13.9	46,482
	9668	Monroe	3,866	0	98	2	16.8	34,090
	9669 **b**	Monroe	3,670	0.8	98.8	1.2	18.6	40,899
Supply Connector	7207	Carroll	3,094	1.9	95.3	4.7	14	39,205
Lines A and B	9757	Harrison	3,341	1.3	97.6	2.4	17.7	33,606
	9759	Harrison	2,574	0	100	0	14.3	42,205
Michigan	-	-	-	**4.7**	**76.1**	**23.9**	**16.8**	**48,411**
Market Segment	603.01	Lenawee	5,099	1.4	97.1	2.9	6	65,208
	605	Lenawee	3,365	8	90	10	10.6	48,897
	606	Lenawee	5,127	5.9	90.5	9.5	4.4	49,122
	617	Lenawee	9,514	7.1	77.9	22.1	14.1	49,577
	619	Lenawee	4,399	3.3	95	5	12.6	43,472
	7225	Livingston	2,243	4.2	92.5	7.5	9.5	71,250

TABLE 4.9.8-1 (continued)								
Demographic and Economic Conditions by Census Tract Crossed by the Rover Pipeline Project								
Project Component	**Census Tract**	**County**	**Pop.**	**Hispanic (percent)**	**White Non-Hispanic (percent)**	**Minorities (percent)**	**Poverty (percent)**	**Mean Household Income ($)**
	7301.01	Livingston	2,828	7.5	92	8	3.2	80,995
	7306	Livingston	3,594	0	96.2	3.8	3.5	80,243
	7311	Livingston	3,832	2.1	96.4	3.6	3.2	75,117
	7331	Livingston	1,874	1.9	96	4	5.3	69,625
	7336.01 **b**	Livingston	2,600	1.6	97.5	2.5	3.6	70,469
	7336.02	Livingston	3,857	0.5	97.8	2.2	7.7	59,278
	4310 **b**	Washtenaw	4,604	1.5	94	6	10.8	62,277
	4320 **b**	Washtenaw	4,998	2.4	95.3	4.7	4.2	75,141
Market Segment	4440	Washtenaw	5,973	1.2	98.6	1.4	2.7	78,185
	4480 **b**	Washtenaw	3,553	5.1	90.6	9.4	6.1	90,568
Averages	**N/A**	**N/A**	**4,011**	**2.1**	**94.9**	**5.1**	**11.7**	**49,401**

a Census Tracts with compressor stations
b Census Tracts with HDD entry and/or exit pits
Source: U.S. Census Bureau 2015a, American Community Survey Five-Year Estimates, 2009-2013

The U.S. Census Bureau defines “low-income populations” as those living below the established poverty level. The U.S. Census Bureau also reports the percentage of county populations with an income below the poverty level. In order to evaluate the potential for a low-income population to be impacted disproportionately, we compared the poverty level rates for census tracts within the region of influence to those of their respective state levels.

The majority of the tracts in the Project area have poverty rates that are similar to or lower than the respective statewide levels. Thirteen of the 89 unique tracts crossed by the Project have a poverty rate that is higher than the respective state. One of the 10 tracts where compressor stations are proposed has a poverty rate that is higher than the respective state. The Cadiz Compressor Station is located in census tract 9760, which has a poverty rate of 18.8, compared to 15.8 for the state. Of the 21 tracts where HDD entry or exit pits are located, 6 have poverty rates above their respective states. The highest poverty rate in the area of the Rover Project is in Jefferson County, Ohio. Census tract 112 has a poverty rate of 27.4 percent compared to 15.8 for the state.

The Rover Project would have negligible to minor negative impacts and minor to moderate positive impacts on socioeconomic characteristics and economies in the surrounding counties. As discussed throughout this EIS, potentially negative environmental effects associated with the Rover Project would be minimized and/or mitigated, as applicable. Although the racial and economic composition of the tracts traversed by the Projects shows some deviations from state-level statistics, there is no evidence that the Projects would cause a disproportionate share of adverse environmental or socioeconomic impacts on any racial, ethnic, or socioeconomic group. The majority of compressor station locations and HDD entry and exit pits are located in tracts with poverty rates and minority populations less than the respective state data.

The primary health issues related to the Rover Project would be the risk associated with an unanticipated pipeline or compressor station failure. Section 4.12 discusses the localized risks to public safety that could result from a pipeline failure and describes how applicable safety regulations and standards would minimize the potential for these risks. Because the Rover Project would generally traverse sparsely populated areas, the number of persons who would be at risk of injury due to a pipeline failure would be low. There is no evidence that such risks would be disproportionately borne by any racial, ethnic, or socioeconomic group.

Construction of the Rover Project would result in minor positive impacts due to increases in payroll taxes, purchases made by the workforce, and expenses associated with the acquisition of material goods and equipment. Operation of the Rover Project would have a minor to moderate positive effect on the counties and local communities due to the increase to property taxes that would be collected.

4.10 CULTURAL RESOURCES

Section 106 of the NHPA, as amended, requires the FERC to take into account the effects of its undertakings on properties either listed or eligible for listing in the National Register of Historic Places (NRHP) and to provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. Rover, Panhandle, and Trunkline are assisting the FERC to meet our obligations under Section 106 by preparing the necessary information, analyses, and recommendations as authorized by 36 CFR 800.2(a)(3).

Construction and operation of the Projects could potentially affect historic properties (that is, cultural resources either listed or eligible for listing in the NRHP). These historic properties could include prehistoric or historic archaeological sites, districts, buildings, structures, or objects, as well as locations with traditional value to Native Americans or other groups. Historic properties must generally possess integrity of location, design, setting, materials, workmanship, feeling, and association, and must meet one or more of the criteria specified in 36 CFR 60.4.

4.10.1 Rover Cultural Resources Surveys

Rover conducted cultural resources field surveys for both archaeological and architectural resources; these surveys are still in progress. The Phase I surveys typically examined a 400-foot-wide survey corridor for the proposed pipeline route that encompassed the pipeline construction right-of-way and associated extra workspace. A 50-foot-wide corridor was surveyed for access roads. Additional Project facilities, including compressor and meter station sites, launcher/receiver facilities, contractor yards, and HDD locations were surveyed in their entirety. For architectural resources, Rover examined the viewsheds to and from the Project corridor, terminating where vegetation and/or topography obstructed lines-of-sight, and up to 0.5 mile surrounding aboveground facilities.

Archaeological resources surveys have not been completed. For the archaeological survey in West Virginia, about 2 percent of the Sherwood Lateral access roads remain to be surveyed. All archaeological surveys have been completed in Pennsylvania. For the archaeological surveys in Ohio, the Burgettstown Contractor Yard and Mainline contractor yards remain to be surveyed. For the archaeological surveys in Michigan, the Michigan contractor yards remains to be surveyed.

Historic architectural resources surveys are complete for the entire Project area in Pennsylvania, West Virginia, and Michigan. However, the contractor yard in Jefferson, Ohio and the Mainline A and B contractor yards in Ohio remain to be surveyed.

Rover submitted survey reports to the FERC and the Pennsylvania, West Virginia, Ohio, and Michigan State Historic Preservation Offices (SHPO) detailing the results of the architectural and archaeological studies. The West Virginia and Michigan reports documented both architectural and archaeological resources, while for Ohio and Pennsylvania, separate reports were provided for architectural and archaeological resources. Rover has also filed addendum reports for Pennsylvania and Michigan.

4.10.1.1 West Virginia

To date, Rover has identified 14 archaeological sites within the survey corridor of the pipeline route in West Virginia. Five sites are prehistoric, eight sites are historic, and one site is prehistoric and historic. One site (46MR48) is considered unassessed and would be avoided. The remaining 13 sites are recommended as not eligible for the NRHP. In addition, deep testing identified no potential for buried deposits at the tested locations.

Rover identified three architectural resources, one structure (Glenn Rock Light) and two cemeteries, within the survey area. The structure was recommended as not eligible for the NRHP. One cemetery (the Stender Cemetery) was recommended as potentially eligible for the NRHP, while the other was recommended as not eligible for the NRHP. Both would be avoided by Project activities, and a 100-foot buffer would be established to ensure avoidance.

In a letter dated February 25, 2015, the West Virginia SHPO identified additional information needed and also requested an addendum report be provided to include survey results of the areas that had not yet been completed due to access.

On March 21, 2016, Rover submitted a revised survey report to the SHPO addressing the SHPO's request. Rover has not yet filed the SHPO's comments on the revised report.

4.10.1.2 Pennsylvania

To date, Rover has identified three historic archaeological sites (36WH1693, 36WH1702, and 36WH1703) within the survey corridor of the pipeline route in Pennsylvania. Rover has also identified six historic architectural resources (a bridge, a cottage, and four farmsteads) within the viewshed of the Project. None of the architectural resources were within the proposed Project workspace. All nine resources were recommended as not eligible for the NRHP.

In a letter dated February 26, 2015, the Pennsylvania SHPO commented on the initial architectural survey report. Of the four historic architectural resources identified in that report, the SHPO concurred with the recommendations of not eligible for two of the resources, requested additional information on one of the farmsteads, and identified one of the resources (the bridge) as eligible for the NRHP. Rover provided additional information on the farmstead, and in a letter dated April 13, 2015, the SHPO responded with additional comments as a result of its review. SHPO concurrence for historic architectural resources is pending review of the requested additional information.

In a letter dated March 17, 2015, the SHPO commented on the initial archaeological survey report and concurred that site 36WH1693 was not eligible for the NRHP. The SHPO also requested that the results of the survey for the remaining portions that had not been surveyed due to access be provided in an addendum report, which Rover provided.

In a letter dated January 15, 2016, the SHPO commented on the addendum archaeological report and concurred that portions of 36WH1702 and 36WH1703 within the area of potential effect were not contributing to site eligibility and no further work was needed.

In a letter dated January 21, 2016, the SHPO commented on the addendum architectural report and concurred that the two farmsteads identified in that report (John Duncan Farm [Key No. 802026] and 25 Purdy Road) were not eligible for the NRHP.

4.10.1.3 Ohio

To date, Rover has identified 193 archaeological sites within the survey corridor of the pipeline route in Ohio. Of these, 145 sites are prehistoric, 36 are historic, and 12 are prehistoric and historic. Six of the sites are considered potentially eligible for the NRHP. One of those sites (33SE285) would be avoided by HDD. Two other sites (33MO138 and 33MO139) are within the study corridor but outside the construction workspace and would be avoided by all Project activities. Rover would place protective fencing around the perimeter of the sites during construction to ensure that no inadvertent impacts occur on these sites. The remaining three sites (33MO133, 33MO135, and 33MO140) have been avoided by realignment of the Project corridor. The remaining 187 archaeological sites are recommended as not eligible for the NRHP. Rover has not yet provided the Ohio SHPO's comments on the archaeological survey report.

Rover identified 79 historic architectural resources including residences, farmsteads, cemeteries, active and abandoned railroads, bridges, a former schoolhouse, a warehouse, and a church. Thirty-six of the resources are recommended as potentially eligible for the NRHP; for 35 of the resources, Rover recommended that the Project would have no adverse effect. One resource (CAR0266012) is an 1843 Federal House located across the road from the proposed Mainline Compressor Station 1. Rover indicated that it would propose screening measures and recommended that the Project would have no adverse effect on this resource. If adverse effects to the resource cannot be avoided, a treatment plan to mitigate potential adverse effects would be required. The remaining 43 historic architectural resources are recommended as not eligible for the NRHP. Six of the properties that are recommended as not eligible are cemeteries. The cemeteries would not be affected by Project activities, but a 100-foot buffer would be established to ensure avoidance. Rover has not yet provided the Ohio SHPO's comments on the architectural survey report.

4.10.1.4 Michigan

To date, Rover has identified 69 archaeological sites within the survey corridor of the pipeline route in Michigan. Of these, 42 of the sites are prehistoric, 20 are historic, and 7 are prehistoric and historic. Ten of the archaeological sites are considered unassessed (20GS147, 20LE193, 20LE338, 20LE355, 20LE368, 20LE387, 20LP357, 20WA452, 20WA461, and 20WA466); all of these have been avoided through realignment of the pipeline corridor or adjustments to extra workspace. Prehistoric site 20LE381 is recommended as eligible for the NRHP; Rover has adjusted the location of a proposed workspace to avoid the site. The remaining 58 archaeological sites are recommended as not eligible for the NRHP.

Rover identified 45 historic architectural resources consisting of either residences or farmstead complexes. Fourteen of the resources are recommended as potentially eligible for the NRHP. Rover recommended that nine of these resources would have no adverse effect. For the remaining five, Rover indicated avoidance plans would be submitted. The remaining 31 historic architectural resources are recommended as not eligible for the NRHP.

In a letter dated October 6, 2015, the SHPO concurred with recommendations for nine archaeological sites that needed avoidance or further study, but requested further information to make determinations of eligibility on aboveground resources. Rover provided the SHPO with a final report addressing the SHPO's October 6, 2015 comments; two addendum reports; and an avoidance plan for the

11 unassessed or eligible sites listed above. Rover has not yet filed the SHPO's comments on the reports or plan.

4.10.1.5 Native American Consultation

Beginning on October 3, 2014, Rover initiated Native American consultation by sending a letter to 42 Indian tribes providing them an opportunity to comment on the Project. Rover also conducted follow-up activities with the tribes. A summary of these letters, follow-up activities, and any correspondence received to date is presented in table 4.10.1-1.

TABLE 4.10.1-1

Rover's Contact with Native American Tribes

Tribe	Date(s) Letter Sent	Date of Follow up Call	Response(s) Received from Tribe as of 05/31/2016
Absentee-Shawnee Tribe of Oklahoma	10/29/2014	2/11/2015	None
Bad River Band of the Lake Superior Tribe of Chippewa Indians	12/11/2014	2/11/2015	None
Bay Mills Indian Community	12/11/2014	2/11/2015	3/12/2015
Bois Forte Band (Nett Lake) of the Minnesota Chippewa Tribe	12/11/2014	2/11/2015	None
Chippewa-Cree Indians of the Rocky Boy's Reservation	12/11/2014		2/2/2015
Citizen Potawatomi Nation	10/03/14 and 10/29/14	2/11/2015	None
Delaware Nation	10/3/2014		10/31/2014
Delaware Tribe of Indians	10/29/2014		11/17/2014, 4/30/2015 and 5/7/2015
Eastern Shawnee Tribe of Oklahoma	10/03/2014 and 10/29/2014	2/11/2015	None
Fond du Lac Band of the Minnesota Chippewas Tribe	12/11/2014 and 2/12/2015	2/11/2015	None
Forest County Potawatomi Community	10/03/2014 and 10/29/2014	2/11/2015	None
Grand Portage Band of the Minnesota Chippewa Tribe	12/11/2014	2/11/2015	None
Grand Traverse Band of Ottawa and Chippewa Indians	12/11/2014	2/11/2015	None
Hannahville Indian Community	10/03/2014 and 2/13/2015	2/11/2015	None
Keweenaw Bay Indian Community	12/11/2014 and 2/13/2015	2/11/2015	None
Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin	12/11/2014	2/11/2015	None
Lac du Flambeau Band of Lake Superior Chippewa Indians of the Lac du Flambeau Reservation of Wisconsin	12/11/2014	2/11/2015	None
Lac Vieux Desert Band of Lake Superior Chippewa Indians	12/11/2014		12/29/2014

TABLE 4.10.1-1 (continued)

Rover's Contact with Native American Tribes

Tribe	Date(s) Letter Sent	Date of Follow up Call	Response(s) Received from Tribe as of 5/31/2016
Leech Lake Band of the Minnesota Chippewa Tribe	12/11/2014	2/11/2015	None
Match-e-be-nash-she-wish Band of Potawatomi Indians of Michigan	12/11/2014	2/11/2015	None
Miami Tribe of Oklahoma	10/03/2014 and 10/29/2014	2/11/2015	3/16/2016
Mille Lacs Band of the Minnesota Chippewa Tribe	12/11/2014	2/11/2015	None
Minnesota Chippewa Tribe	12/11/2014	2/11/2015	None
Nottawaseppi Huron Band of the Potawatomi	12/11/2014 and 12/18/2014	2/11/2015	None
Ottawa Tribe of Oklahoma	10/03/2014, 10/29/2014, and 2/13/2015	2/11/2015	None
Peoria Tribe of Oklahoma	10/3/2014		10/8/2014
Pokagon Band of Potawatomi Indians	10/03/2014, 10/29/2014, and 2/13/2015	2/11/2015	2/25/2015
Prairie Band Potawatomi Nation	10/03/2014 and 10/29/2014	2/11/2015	None
Quechan Tribe of the Fort Yuma Indian Reservation	12/11/2014	2/11/2015	None
Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin	12/11/2014 and 2/13/2015	2/11/2015	3/13/2015
Red Lake Band of Chippewa Indians	12/11/2014	2/11/2015	None
Saginaw Chippewa Indian Tribe	10/03/2014 and 11/12/2014	2/11/2015	None
Sault Ste. Marie Tribe of Chippewa Indians of Michigan	12/11/2014	2/11/2015	None
Seneca Nation of Indians	10/03/2014, 10/29/2014, and 11/12/2014		10/29/2014
Seneca-Cayuga Tribe of Indians	10/29/2014	2/11/2015	None
Shawnee Tribe	10/03/2014 and 10/29/2014	2/11/2015	None
Sokaogan Chippewa Community	12/11/2014	2/11/2015	None
St. Croix Chippewa Indians of Wisconsin	12/11/2014	2/11/2015	None
Tonawanda Band of Seneca Nation	10/29/2014	2/11/2015	None
Turtle Mountain Band of Chippewa Indians of North Dakota	12/11/2014	2/11/2015	None
White Earth Band of Minnesota Chippewa Tribe	12/11/2014		1/12/2015
Wyandotte Nation	10/03/2014 and 10/29/2014	2/11/2015	None

The Delaware Nation, Peoria Tribe of Oklahoma, and White Earth Band of Minnesota Chippewa Tribe all indicated that they had no objections to the Rover Project and are not aware of Indian Religious

Sites or resources associated with their tribes near the Project location. The Chippewa-Cree Indians of the Rocky Boy's Reservation requested that Project information be posted to a website. The requested information was posted to that website. The Hannahville Indian Community, Keweenaw Bay Indian Community, Ottawa Tribe of Oklahoma, Pokagon Band of Potawatomi Indians, and Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin all requested new copies of the letter via email, which Rover sent out on February 13, 2015.

The Pokagon Band of Potawatomi Indians requested a copy of the Michigan survey report, as well as maps showing pipeline locations in Lenawee and Washtenaw counties. Rover provided the requested information and report. The Delaware Tribe of Indians requested the survey report(s), which Rover provided, and to be consulted in the event of inadvertent discoveries. The Red Cliff Band of Lake Superior Chippewa Indians requested a copy of the Michigan survey report, which Rover provided. The Bay Mills Indian Community outlined its fee structure to review Project documents. Rover provided the Bay Mills Indian Community with the Michigan survey report. No further responses have been received to date.

We sent our NOI and follow-up letters to these same tribes (with the exception of the Quechan Tribe of the Fort Yuma Indian Reservation). The Seneca Nation requested to be kept informed of any impacts on sites, mounds, or burials in the northeast Ohio region. The Miami Tribe of Oklahoma stated that it had no objection to the proposed Project at the time, but asked to be a consulting party to the Project. To date, no other responses to our NOI or follow-up letters have been received.

4.10.1.6 Rover Unanticipated Discoveries Plan

Rover prepared a plan for unanticipated discoveries to be implemented in the event that cultural resources or human remains are encountered during construction. The plan provides for the notification of interested parties, including Indian tribes, in the event of any discovery. The plan was submitted to the SHPOs for review. In a letter dated April 27, 2015, the West Virginia SHPO found the plan acceptable and provided a clarification of state law. The Pennsylvania SHPO concurred with the plan on May 8, 2015. To date, no response has been received from the Ohio SHPO or the Michigan SHPO. We reviewed the plan and find it acceptable.

4.10.2 Panhandle Backhaul Project

Panhandle contacted the Indiana, Illinois, Michigan, and Ohio SHPOs regarding the Panhandle Project. In a letter dated January 19, 2015, the Indiana SHPO indicated it had not identified any historic buildings, structures, districts, or objects listed in or eligible for the NRHP in the Project area. The SHPO also indicated that no archaeological investigations were necessary. In a letter dated January 12, 2015, the Illinois SHPO indicated that "no historic properties are affected" by the Project. In a letter dated February 18, 2015, the Michigan SHPO indicated that "no historic properties are affected" by the Project. In a letter dated February 23, 2015, the Ohio SHPO indicated it was "unlikely that the project will affect historic properties." We concur with the SHPOs and find that the Panhandle Backhaul Project would not affect historic properties. Panhandle also provided a "categorical exclusion agreement" with the Illinois SHPO, identifying activities that would not require consultation with the SHPO.

On February 20, 2015, Panhandle initiated Native American consultation by sending letters to the Bay Mills Chippewa Indian Community, Grand Traverse Band of Ottawa and Chippewa Indians, Hannahville Potawatomi Indian Community, Keweenaw Bay Indian Community, Lac Vieux Desert Band of Lake Superior Chippewa Indians, Little River Band of Ottawa Indians, Little Traverse Bay Bands of Odawa Indians, Match-E-Be-Nash-She-Wish Band of Potawatomi Indians, Nottawaseppi Huron Potawatomi, Pokagon Band of Potawatomi (Gun Lake), Saginaw Chippewa Indian Tribe, and Sault Ste. Marie Tribe of Chippewa Indians, providing them an opportunity to comment on the Project. The Lac

View Desert Band of Lake Superior Chippewa Indians, Little River Band of Ottawa Indians, and Saginaw Chippewa Indian Tribe concurred that the Project would have "no effect" (February 26, 2015, February 25, 2015, and February 26, 2015, respectively). On March 3, 2015, the Little Traverse Bay Bands of Odawa Indians indicated there were no known cultural resources associated with the tribe in the Project area. In a letter dated April 13, 2015, the Bay Mills Indian Community found the Project would have "no adverse effect." No further responses have been received. We sent our NOI to these same tribes. No responses to our NOI have been received.

Panhandle provided a plan to address the unanticipated discovery of historic properties and human remains during construction. We reviewed the plan and find it acceptable.

4.10.3 Trunkline Backhaul Project

Trunkline contacted the Tennessee, Mississippi, and Illinois SHPOs regarding the Project. In a letter dated January 8, 2015, the Tennessee SHPO determined that there are no NRHP listed or eligible properties affected by this undertaking. In a letter dated January 23, 2015, the Mississippi SHPO determined that "no cultural resources are likely to be affected" by the Project. In letters dated January 12 and 22, 2015, the Illinois SHPO indicated that "no historic properties are affected" by the Project. We concur with the SHPOs and find that the Trunkline Project would not affect historic properties. Trunkline also provided "categorical exclusion agreements" with the Illinois and Tennessee SHPOs, identifying activities that would not require consultation with the SHPO or that would not affect historic properties.

On February 20, 2015, Trunkline initiated Native American consultation by sending a letter to the Mississippi Band of Choctaw Indians, providing them an opportunity to comment on the Project. On March 17, 2015, the Mississippi Band of Choctaw Indians concurred that the Project would have "no effect."

Trunkline provided a plan to address the unanticipated discovery of historic properties and human remains during construction. We reviewed the plan and find it acceptable.

4.10.4 Compliance with the National Historic Preservation Act

Compliance with Section 106 of the NHPA is complete for the Panhandle and Trunkline Projects. However, Rover has not completed archaeological surveys in West Virginia, Ohio, and Michigan nor architectural surveys in Ohio. Once cultural resources surveys and eligibility evaluations are complete, if any historic properties would be adversely affected by the Project, a treatment plan would be prepared.

To ensure that required cultural resources studies and consultation are completed and the FERC's responsibilities under Section 106 of the NHPA are met, **we recommend that:**

- **Rover should not begin implementation of any treatment plans/measures (including archaeological data recovery); construction of facilities; or use of staging, storage, or temporary work areas and new or to-be-improved access roads <u>until</u>:**

  a. Rover files with the Secretary:

    i. the Ohio SHPO's comments on the Ohio archaeological and architectural survey reports;

    ii. the Michigan SHPO's comments on the Michigan final report, addendum 1 and 2 reports, and avoidance plan for 11 sites;

iii. **the West Virginia SHPO's comments on the revised West Virginia survey report;**

iv. **the Pennsylvania SHPO's comments on the additional architectural information requested in its April 13, 2015 letter;**

v. **all outstanding cultural resources survey/testing reports and any required evaluation reports, and the SHPOs' comments on the reports; and**

vi. **any necessary treatment plans or site-specific protection plans, and the appropriate SHPO's comments on the plans;**

b. **the ACHP is provided an opportunity to comment if historic properties would be adversely affected; and**

c. **the FERC staff reviews and the Director of OEP approves all cultural resources survey reports and plans, and notifies Rover in writing that treatment plans/mitigation measures may be implemented or construction may proceed.**

All material filed with the Secretary containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "CONTAINS PRIVILEGED INFORMATION - DO NOT RELEASE."

4.11 AIR QUALITY AND NOISE

4.11.1 Air Quality

Air quality would be affected by construction and operation of the Projects. For the Rover Project, although air emissions would be generated by construction activities, these emissions would be temporary and spread over a large area. The Rover Project aboveground facilities consist of 10 compressor stations, 21 meter stations, 77 mainline valves, 6 tie-ins, and 11 pig launchers/receivers. The majority of new emissions from the Rover Project would result from operation of the 10 new compressor stations. No new compressor stations would be required for the Panhandle and Trunkline Projects. However, both the Panhandle and Trunkline Projects would require modifications to existing facilities. The Panhandle Project consists of modifications at four existing compressor stations, three gates, and at an interconnection along Panhandle's existing pipeline system. The Trunkline Project consists of modifications at four existing compressor stations, one meter station, and at an interconnection along Trunkline's existing pipeline system. The modifications would result in emissions during construction at the sites and operations due to the addition of new piping, valves, atmospheric tanks, and one process heater at the Edgerton Compressor Station.

4.11.1.1 Existing Air Quality

The climate in the Rover, Panhandle, and Trunkline Project areas located in West Virginia, Ohio, Michigan, Illinois, Indiana, and Tennessee is described as humid continental, characterized by frequent changes in the weather with large ranges in temperature. The southern portion of the Trunkline Project, located in Mississippi, is in an area described as humid subtropical. Although the potential exists for drought and flood, rainfall is typically spread out consistently over the year. The winters are temperate, and summers long and hot.

Ambient air quality is protected by federal and state regulations. The EPA established National Ambient Air Quality Standards (NAAQS) to protect human health and welfare. Primary standards protect human health, including the health of "sensitive" populations, such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. NAAQS have been developed for SO_2, particulate matter (PM) with a diameter of 10 microns or less (PM_{10}), PM with a diameter of 2.5 microns or less ($PM_{2.5}$), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), and lead (Pb), and include levels for short-term (acute) and long-term (chronic) exposures. However, O_3 is not a pollutant emitted into the air. It is formed from a chemical reaction between NO_X and volatile organic compounds (VOC) in the presence of sunlight. Consequently, emissions of NO_X and VOCs are regulated by the EPA as "precursors" to the formation of O_3. The current NAAQS are listed on the EPA's website at http://www.epa.gov/ttn/naaqs/criteria.html.

For the Rover, Panhandle, and Trunkline Project areas, the OHEPA, the WVDEP, the PADEP, the MIDEQ, the Illinois Environmental Protection Agency (ILEPA), and the Mississippi Department of Environmental Quality (MSDEQ) have all adopted the NAAQS, as promulgated by the EPA. The Indiana Department of Environmental Management (INDEM) and the Tennessee Department of Environment & Conservation (TNDEC) have adopted the EPA's NAAQS, but each state also applies their own standard for total suspended particulates.

The EPA now defines air pollution to include the mix of six long-lived and directly emitted greenhouse gases (GHGs), finding that the presence of the following GHGs in the atmosphere may endanger public health and welfare through climate change: CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. As with any fossil-fuel fired project or activity, the Projects would contribute GHG emissions. The principle GHGs that would be produced by the Projects are CO_2, CH_4, and N_2O. No fluorinated gases would be emitted by the Projects. GHG emissions are quantified and regulated in units of CO_2 equivalents (CO_2e). The CO_2e takes into account the global warming potential (GWP) of each GHG. The GWP is a ratio relative to CO_2 of a particular GHG's ability to absorb solar radiation as well its residence time within the atmosphere. Thus, CO_2 has a GWP of 1, CH_4 has a GWP of 25, and N_2O has a GWP of 298 (EPA, 2014i)[6]. We received comments on the amount and impacts of GHG emission the Project would contribute. In compliance with EPA's definition of air pollution to include GHGs, we have provided estimates of GHG emissions for construction and operation, as discussed throughout this section. Impacts from GHG emissions (i.e., climate change) are discussed in more detail in section 4.13.

Air quality control regions (AQCRs) are areas established by the EPA and local agencies for air quality planning purposes, in which State Implementation Plans describe how the NAAQS would be achieved and maintained. The AQCRs are intra- and interstate regions such as large metropolitan areas where improvement of the air quality in one portion of the AQCR requires emission reductions throughout the AQCR. Each AQCR, or smaller portion within an AQCR (such as a county or multiple counties), is designated, based on compliance with the NAAQS, as attainment, unclassifiable, maintenance, or nonattainment, on a pollutant-by-pollutant basis. Areas in compliance or below the NAAQS are designated as attainment, while areas not in compliance or above the NAAQS are designated as nonattainment. Areas previously designated as nonattainment that have since demonstrated compliance with the NAAQS are designated as maintenance for that pollutant. Maintenance areas may be subject to more stringent regulatory requirements to ensure continued attainment of the NAAQS. Areas

---

[6] These GWPs are based on a 100-year time period. We have selected their use over other published GWPs for other timeframes because these are the GWPs that the EPA has established for reporting of GHG emissions and air permitting requirements. This allows for a consistent comparison with these regulatory requirements.

that lack sufficient data to determine attainment status are designated unclassifiable and treated as attainment areas.

The Projects' area(s) are designated as attainment or unclassifiable for all pollutants, except as shown in table 4.11.1-1.

In addition, Pennsylvania is included in the Ozone Transport Region (OTR). The OTR was established under Section 176A of the CAA amendments in 1990, and includes 11 northeastern states in which O_3 transports from one or more states and contributes to a violation of the O_3 NAAQS in one or more other states (OTC, 2015). States in this region are required to submit a state implementation plan, stationary sources are subject to more stringent permitting requirements, and various regulatory thresholds are lower for the pollutants that form ozone, even if they meet the O_3 NAAQS.

The majority of operational emissions from the Rover Project would result from the compressor stations. The EPA, along with state and local agencies, collects data on ambient air quality at monitoring stations across the United States. To characterize existing ambient air quality conditions for the Rover Project, air quality data at the monitoring stations that were most representative of each proposed compressor station were collected and are presented in table 4.11.1-14 in combination with the Project impact for comparison with NAAQS.

4.11.1.2 Air Quality Regulatory Requirements

Air quality in the United States is regulated by federal statutes in the CAA and its amendments. The provisions of the CAA that are applicable to the proposed Projects are discussed below.

Air Permitting

New Source Review (NSR) is a pre-construction permitting program designed to protect air quality when air pollutant emissions are increased either through the modification of existing sources or through the construction of a new source of air pollution. In areas with good air quality, NSR ensures that the new emissions do not degrade the air quality, which is achieved through the implementation of the Prevention of Significant Deterioration (PSD) permitting program or state minor permit programs. In areas with poor air quality, Nonattainment NSR ensures that the new emissions do not inhibit progress toward cleaner air. In addition, NSR ensures that any large, new, or modified industrial source uses air pollution control technology. Air permitting of stationary sources has been delegated to each state. Based on the operating emissions presented in tables 4.11.1-2 through 4.11.1-11, no major PSD or nonattainment new source review (NNSR) permits would be required for any of Rover's new compressor stations. No PSD or NNSR permits would be required for the Panhandle or Trunkline Projects, as the revisions to the existing compressor stations would not cause any increase in operational emissions, except for small increases in fugitive GHGs and VOCs.

Title V is an operating permit program run by each state. Based on the emissions shown in tables 4.11.1-2 through 4.11.1-11, the following compressor stations would be subject to Title V Permitting for the Rover Project: Seneca, Mainline 1, Mainline 2, Mainline 3, and Defiance. Therefore, Rover would need to apply for a Title V permit for each of these sources within 12 months of commencing operation. As stated above, because there would not be any increase in operational emissions due to the Panhandle and Trunkline Projects, except for small increases in fugitive GHGs and VOCs, there would be no change to the Title V status for these Projects.

TABLE 4.11.1-1

Nonattainment and Maintenance Areas within the Projects' Area(s), by Project Component

Project Component	Designation(s)	County, State	Nonattainment/ Maintenance Area
12.3 miles of Lateral, Compressor Station, Meter Station	$PM_{2.5}$ Maintenance	Marshall, WV	Wheeling, WV-OH
	O_3 Maintenance	Marshall, WV	Wheeling, WV-OH
36.0 miles of Lateral	$PM_{2.5}$ Maintenance	Belmont, OH	Wheeling, WV-OH
	O_3 Maintenance	Belmont, OH	Wheeling, WV-OH
10.2 miles of Lateral, Compressor Station, Meter Station	$PM_{2.5}$ Maintenance	Washington, PA	Township of Taylor South of New Castle
	O_3 Maintenance	Washington, PA	Pittsburgh-Beaver Valley, PA
5.6 miles of Mainline	$PM_{2.5}$ Maintenance	Hancock, WV	Steubenville-Wierton, OH-WV
	O_3 Maintenance	Hancock, WV	Steubenville-Wierton, OH-WV
20.1 miles of Lateral	$PM_{2.5}$ Maintenance	Jefferson, OH	Steubenville-Wierton, OH-WV
	O_3 Maintenance	Jefferson, OH	Steubenville-Wierton, OH-WV
14.3 miles of Mainline	$PM_{2.5}$ Maintenance	Stark, OH	Canton-Massillon, OH
	O_3 Maintenance	Stark, OH	Canton-Massillon, OH
22.6 miles of Mainline	O_3 Maintenance	Wood, OH	Toledo, OH Area
29.2 miles of Market, Gate Station	O_3 Maintenance	Lenawee, MI	Detroit-Ann Arbor, MI
27.6 miles of Market, Delivery Station	$PM_{2.5}$ Maintenance	Washtenaw, MI	Detroit-Ann Arbor, MI
	O_3 Maintenance	Washtenaw, MI	Detroit-Ann Arbor, MI
15.2 miles of Market, Delivery Station	$PM_{2.5}$ Maintenance	Livingston, MI	Detroit-Ann Arbor, MI
	O_3 Maintenance	Livingston, MI	Detroit-Ann Arbor, MI
Gate Station	PM_{10} Maintenance	Vermillion, IN	Vermillion Co., IN
Compressor Station	$PM_{2.5}$ Maintenance	Marion, IN	Indianapolis, IN
	O_3 Maintenance	Marion, IN	Indianapolis, IN
Gate Station	$PM_{2.5}$ Maintenance	Hamilton, IN	Indianapolis, IN
	O_3 Maintenance	Hamilton, IN	Indianapolis, IN
Compressor Station	O_3 Maintenance	Allen, IN	Ft Wayne, IN
Source: EPA, 2015e			

TABLE 4.11.1-2

Potential Emissions from the Sherwood Compressor Station (tpy)

Emissions Source (number)	NO_X	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	Single HAP/ Total HAPs	CO_2e
Compressor Engines (3)	68.6	51.8	26.4	0.3	4.6	4.6	8.6/13.6	54,534.8
Emergency Generators (1)	3	<0.1	0.2	0.1	<0.1	<0.1	<0.1/<0.1	146.7
Site Fugitives (all)	--	1.5	--	--	--	--	<0.1/<0.1	1,350.9
Tank Fugitives (7)	--	<0.1	--	--	--	--	--/--	--
Truck Loading Fugitives (2)	--	<0.1	--	--	--	--	--/--	--
CIG Flameless Gas Infrared Heater (1)	0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1/<0.1	263.6
Compressor Blowdown Fugitives (all)	--	0.1	--	--	--	--	<0.1/<0.1	132.2
Engine Starter Vents (all)	--	0.3	--	--	--	--	<0.1	173.5
Pigging Operation Fugitives	--	0.1	--	--	--	--	<0.1/<0.1	77.1
Unpaved Road Fugitives	--	--	--	--	0.1	<0.1	--	--
Station Venting and Blowdown	--	--	--	--	--	--	--/--	382.8
Total	**71.8**	**53.8**	**26.8**	**0.4**	**4.7**	**4.6**	**8.6/13.6**	**57,061.6**

TABLE 4.11.1-3

Potential Emissions from the Seneca Compressor Station (tpy)

Emissions Source (number)	NO_X	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	Single HAP/ Total HAPs	CO_2e
Compressor Engines (4)	91.4	69.5	35.2	0.4	6.2	6.2	11.9/17.9	72,713.0
Emergency Generators (1)	2.9	<0.1	0.1	0.1	<0.1	<0.1	<0.1/<0.1	205.8
Site Fugitives (all)	--	2.6	--	--	--	--	<0.1/<0.1	1,748.6
Tank Fugitives (7)	--	<0.1	--	--	--	--	--/--	--
Truck Loading Fugitives(2)	--	<0.1	--	--	--	--	--/--	--
CIG Flameless Gas Infrared Heater (1)	0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1/<0.1	263.6
Compressor Blowdown Fugitives (all)	--	0.2	--	--	--	--	<0.1/<0.1	176.3
Engine Starter Vents (all)	--	0.2	--	--	--	--	<0.1/<0.1	231.0
Pigging Operation Fugitives	--	0.1	--	--	--	--	<0.1/<0.1	28.2
Unpaved Road Fugitives	--	--	--	--	0.1	<0.1	--	--
Station Venting and Blowdown	--	--	--	--	--	--	--/--	435.8
Total	**94.5**	**72.6**	**35.4**	**0.5**	**6.3**	**6.2**	**11.9/17.9**	**75,798.2**

TABLE 4.11.1-4

Potential Emissions from the Clarington Compressor Station (tpy)

Emissions Source (number)	NO_X	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	Single HAP/ Total HAPs	CO_2e
Compressor Engines (3)	54.3	39.5	20.9	0.2	3.7	3.7	6.4/10.0	43,265.6
Emergency Generators (1)	1	<0.1	0.1	0.1	<0.1	<0.1	<0.1/<0.1	119.9
Site Fugitives (all)	--	0.6	--	--	--	--	<0.1/<0.1	374.5
Tank Fugitives (7)	--	<0.1	--	--	--	--	--/--	--
Truck Loading Fugitives (2)	--	<0.1	--	--	--	--	--/--	--
CIG Flameless Gas Infrared Heater (all)	0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1/<0.1	263.6
Compressor Blowdown Fugitives (all)	--	0.1	--	--	--	--	<0.1/<0.1	125.3
Engine Starter Vents (all)	--	0.2	--	--	--	--	<0.1/<0.1	173.5
Unpaved Road Fugitives	--	--	--	--	0.1	<0.1	--	--
Station Venting and Blowdown	--	--	--	--	--	--	--/--	298.8
Total	**55.5**	**40.4**	**21.2**	**0.3**	**3.8**	**3.7**	**6.4/10.0**	**44,621.2**

TABLE 4.11.1-5

Potential Emissions from the Majorsville Compressor Station (tpy) a

Emissions Source (number)	NO_X	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	Single HAP/ Total HAPs	CO_2e
Compressor Engines (2)	34.3	31.2	37.7	0.1	2.3	2.3	8.9/11.2	27,410.6
Emergency Generators (1)	1.5	<0.1	0.2	0.1	<0.1	<0.1	<0.1/<0.1	127.8
Site Fugitives (all)	--	1.4	--	--	--	--	<0.1/<0.1	205.1
Tank Fugitives (7)	--	<0.1	--	--	--	--	--/--	--
Truck Loading Fugitives(2)	--	<0.1	--	--	--	--	--/--	--
CIG Flameless Gas Infrared Heater (all)	0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1/<0.1	263.6
Compressor Blowdown Fugitives (all)	--	0.1	--	--	--	--	<0.1/<0.1	66.1
Engine Starter Vents (all)	--	0.2	--	--	--	--	<0.1	86.7
Pigging Operation Fugitives	--	0.1	--	--	--	--	<0.1/<0.1	77.1
Unpaved Road Fugitives	--	--	--	--	0.2	<0.1	--/--	--
Station Venting and Blowdown	--	--	--	--	--	--	--/--	229.9
Total	**36**	**33**	**37.9**	**0.2**	**2.5**	**2.3**	**8.9/11.2**	**28,467.0**

a The WVDEP noted that the permitted emissions for this facility are different than those presented in this table. This table is based on the most recent publicly available information, and represents estimates of the scope of emissions. Rover would be required to comply with its permitted emission levels.

TABLE 4.11.1-6

Potential Emissions from the Cadiz Compressor Station (tpy)

Emissions Source (number)	NO_X	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	Single HAP/ Total HAPs	CO_2e
Compressor Engines (4)	77.2	56.9	29.7	0.3	5.2	5.2	9.4/13.8	61,443.8
Emergency Generators (1)	2.9	<0.1	0.1	0.1	<0.1	<0.1	<0.1/<0.1	205.8
Site Fugitives (all)	--	2.6	--	--	--	--	<0.1/<0.1	1,350.9
Tank Fugitives (7)	--	<0.1	--	--	--	--	--/--	--
Truck Loading Fugitives (2)	--	<0.1	--	--	--	--	--/--	--
CIG Flameless Gas Infrared Heater (1)	0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1/<0.1	263.6
Compressor Blowdown Fugitives (all)	--	0.2	--	--	--	--	<0.1/<0.1	169.4
Engine Starter Vents (all)	--	0.2	--	--	--	--	<0.1/<0.1	195.2
Pigging Operation Fugitives	--	<0.1	--	--	--	--	<0.1/<0.1	41.5
Unpaved Road Fugitives	--	--	--	--	0.1	<0.1	--/--	--
Station Venting and Blowdown	--	--	--	--	--	--	--/--	406.1
Total	**80.3**	**59.9**	**30**	**0.4**	**5.3**	**5.2**	**9.4/13.8**	**64,076.2**

TABLE 4.11.1-7

Potential Emissions from the Burgettstown Compressor Station (tpy)

Emissions Source (number)	NO_X	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	Single HAP/ Total HAPs	CO_2e
Compressor Engines (3)	25	14.9	8.7	0.1	1.8	1.8	2.4/4.2	21,602.0
Emergency Generators (1)	1.5	<0.1	0.2	<0.1	<0.1	<0.1	<0.1/<0.1	127.8
Site Fugitives (all)	--	0.4	--	--	--	--	<0.1/<0.1	290.8
Tank Fugitives (7)	--	<0.1	--	--	--	--	--/--	--
Truck Loading Fugitives (2)	--	<0.1	--	--	--	--	--/--	--
CIG Flameless Gas Infrared Heater	0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1/<0.1	263.6
Compressor Blowdown Fugitives (all)	--	<0.1	--	--	--	--	<0.1/<0.1	48.2
Engine Starter Vents (all)	--	<0.1	--	--	--	--	<0.1/<0.1	63.2
Pigging Operation Fugitives	--	<0.1	--	--	--	--	<0.1/<0.1	77.1
Unpaved Road Fugitives	--	--	--	--	0.1	<0.1	--/--	--
Station Venting and Blowdown	--	--	--	--	--	--	--/--	188.5
Total	**26.7**	**15.3**	**9.1**	**0.1**	**1.9**	**1.8**	**2.4/4.2**	**22,661.1**

TABLE 4.11.1-8

Potential Emissions from the Rover Mainline 1 Compressor Station (tpy)

Emissions Source (number)	NO_X	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	Single HAP/ Total HAPs	CO_2e
Compressor Engines (6)	203.7	126.4	88.6	0.7	12.6	12.6	51.7/62.8	148,036.5
Emergency Generators (2)	7.3	<0.1	0.2	0.3	<0.1	<0.1	<0.1/<0.1	548.3
Site Fugitives (all)	--	2.6	--	--	--	--	<0.1/<0.1	1,350.9
Tank Fugitives (6)	--	<0.1	--	--	--	--	--/--	--
Truck Loading Fugitives (2)	--	<0.1	--	--	--	--	--/--	--
CIG Flameless Gas Infrared Heater (1)	0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1/<0.1	263.6
Compressor Blowdown Fugitives (all)	--	0.4	--	--	--	--	<0.1/<0.1	392.7
Engine Starter Vents (all)	--	0.5	--	--	--	--	<0.1/<0.1	515.4
Unpaved Road Fugitives	--		--	--	0.1	<0.1	--/--	--
Station Venting and Blowdown	--	--	--	--	--	--	--/--	908.0
Total	**211.2**	**129.9**	**89**	**1**	**12.7**	**12.6**	**51.7/62.8**	**152,015.4**

TABLE 4.11.1-9

Potential Emissions from the Mainline 2 Compressor Station (tpy)

Emissions Source (number)	NO_X	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	Single HAP/ Total HAPs	CO_2e
Compressor Engines (6)	187.1	120.8	79.7	0.69	11.8	11.8	43.3/53.9	138,295.6
Emergency Generators (2)	6.1	<0.1	0.3	0.2	<0.1	<0.1	<0.1/<0.1	439.0
Site Fugitives (all)	--	2.6	--	--	--	--	<0.1/<0.1	1,350.9
Tank Fugitives (6)	--	<0.1	--	--	--	--	--/--	--
Truck Loading Fugitives (2)	--	<0.1	--	--	--	--	--/--	--
CIG Flameless Gas Infrared Heater (1)	0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1/<0.1	263.6
Compressor Blowdown Fugitives (all)	--	0.3	--	--	--	--	<0.1/<0.1	360.6
Engine Starter Vents (all)	--	0.4	--	--	--	--	<0.1	473.3
Pigging Operation Fugitives	--	0.3	--	--	--	--	<0.1/<0.1	308.5
Unpaved Road Fugitives	--	--	--	--	0.1	<0.1	--/--	--
Station Venting and Blowdown	--	--	--	--	--	--	--/--	1,142.3
Total	**193.4**	**124.4**	**80.2**	**0.91**	**11.9**	**11.8**	**43.3/53.9**	**142,633.7**

TABLE 4.11.1-10

Potential Emissions from the Mainline 3 Compressor Station (tpy)

Emissions Source (number)	NO_X	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	Single HAP/ Total HAPs	CO_2e
Compressor Engines (5)	164.2	103.5	70.9	0.6	10.2	10.2	40.3/49.4	120,117.3
Emergency Generators (2)	6.1	<0.1	0.3	0.2	<0.1	<0.1	<0.1/<0.1	439.0
Site Fugitives (all)	--	2.6	--	--	--	--	<0.1/<0.1	1,350.9
Tank Fugitives (6)	--	<0.1	--	--	--	--	--/--	--
Truck Loading Fugitives (2)	--	<0.1	--	--	--	--	--/--	--
CIG Flameless Gas Infrared Heater (1)	0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1/<0.1	263.6
Compressor Blowdown Fugitives (all)	--	0.3	--	--	--	--	<0.1/<0.1	316.5
Engine Starter Vents (all)	--	0.4	--	--	--	--	<0.1/<0.1	415.4
Pigging Operation Fugitives	--	0.3	--	--	--	--	<0.1/<0.1	308.5
Unpaved Road Fugitives	--	--	--	--	0.1	<0.1	--	--
Station Venting and Blowdown	--	--	--	--	--	--	--/--	1,040.4
Total	**170.5**	**107.1**	**71.4**	**0.8**	**10.3**	**10.2**	**40.3/49.4**	**124,251.6**

TABLE 4.11.1-11

Potential Emissions from the Defiance Compressor Station (tpy)

Emissions Source (number)	NO_X	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	Single HAP/ Total HAPs	CO_2e
Compressor Engines (4)	124.7	80.6	53.1	0.5	7.9	7.9	28.8/35.9	92,197.1
Emergency Generators (1)	3.6	<0.1	0.1	0.1	<0.1	<0.1	<0.1/<0.1	274.4
Site Fugitives (all)	--	2.6	--	--	--	--	<0.1/<0.1	1,350.9
Tank Fugitives (6)	--	<0.1	--	--	--	--	--/--	--
Truck Loading Fugitives (2)	--	<0.1	--	--	--	--	--/--	--
CIG Flameless Gas Infrared Heater (1)	0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1/<0.1	263.6
Compressor Blowdown Fugitives (all)	--	0.2	--	--	--	--	<0.1/<0.1	240.4
Engine Starter Vents (all)	--	0.3	--	--	--	--	<0.1/<0.1	315.5
Pigging Operation Fugitives	--	0.1	--	--	--	--	<0.1/<0.1	154.2
Unpaved Road Fugitives	--	--	--	--	0.1	<0.1	--/--	--
Station Venting and Blowdown	--	--	--	--	--	--	--/--	710.1
Total	**128.5**	**83.8**	**53.4**	**0.6**	**8**	**7.9**	**28.8/35.9**	**95,506.2**

Mandatory Green House Gas Reporting Rule

The EPA also established the final Mandatory GHG Reporting Rule. This rule requires applicable sources of GHG emissions to report their actual GHG operating emissions, if they exceed 25,000 metric tons of CO_2e in 1 year. This rule is not a permit and does not limit or control emissions. Although this rule does not apply to construction emissions, we have provided GHG construction emission estimates, as CO_2e, for accounting and disclosure purposes in section 4.11.1.3. Operational GHG emission estimates for the Projects are presented, as CO_2e, in tables 4.11.1-2 through 4.11.1-11. Based on the emission estimates presented, actual GHG emissions from operation of each Rover compressor station, except the Burgettstown Compressor Station, has the potential to exceed the 25,000 metric tons per year (tpy) reporting threshold. Therefore, if the actual emissions during operations from any of the compressor stations are equal to or greater than 25,000 metric tpy, Rover would need to report GHG emissions for that facility. None of the Panhandle or Trunkline modifications would emit GHGs subject to the Mandatory GHG Reporting Rule.

National Emission Standards for Hazardous Air Pollutants

The CAA Amendments established a list of 189 HAPs, resulting in the promulgation of National Emission Standards for Hazardous Air Pollutants (NESHAPs). The NESHAPs regulate HAP emissions from stationary sources by setting emission limits, monitoring, testing, record keeping, and notification requirements. Subpart ZZZZ (*National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*) would apply to the emergency electrical power generators at each compressor station. Rover would be subject to all applicable Subpart ZZZZ monitoring, recordkeeping, and reporting requirements and/or would comply with NESHAPs Subpart ZZZZ by complying with New Source Performance Standards (NSPS) Subpart JJJJ requirements. Subpart DDDDD (*National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters*) would apply to the heaters at the Mainline 1, Mainline 2, Mainline 3, Defiance, and Seneca Compressor Stations. Rover would comply with all applicable Subpart DDDDD monitoring, recordkeeping, and reporting requirements. The Panhandle and Trunkline Projects would not trigger any additional NESHAP over what is already applicable at the source.

New Source Performance Standards

The EPA promulgates NSPS to establish emission limits and fuel, monitoring, notification, reporting, and recordkeeping requirements for stationary source types or categories that cause or contribute significantly to air pollution. Subpart IIII (*Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*) sets emission standards for NO_X plus non-methane hydrocarbons, NO_X, CO, and PM. Subpart IIII would apply to the emergency electrical power generators at each of the Rover compressor stations. NSPS Subpart JJJJ (*Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*) sets emission standards for NO_X, CO, and VOC. Subpart JJJJ would apply to the compressor engines at each of the Rover compressor stations. Rover would comply with all applicable requirements of subparts IIII and JJJJ. The Panhandle and Trunkline Projects would not trigger any additional NSPS at the existing compressor stations.

General Conformity

The General Conformity Rule was developed to ensure that federal actions in nonattainment and maintenance areas do not impede states' attainment of the NAAQS. The lead federal agency must conduct a conformity determination if a federal action's construction and operational activities is likely to result in generating direct and indirect emissions that would exceed the General Conformity Applicability threshold levels of the pollutant(s) for which an air basin is designated nonattainment or maintenance. Conforming activities or actions should not, through additional air pollutant emissions:

- cause or contribute to new violations of the NAAQS in any area;
- increase the frequency or severity of any existing violation of any NAAQS; or
- delay timely attainment of any NAAQS or interim emission reductions.

The General Conformity Rule entails both an applicability analysis and a subsequent conformity determination, if applicable. According to the General Conformity regulations, emissions from sources that are subject to any NSR permitting and/or licensing (major or minor) are exempt and are deemed to have conformed. A General Conformity Determination must be completed when the total direct and indirect emissions of a project would equal or exceed the specified pollutant thresholds on a calendar year basis for each nonattainment or maintenance area.

Table 4.11.1-12 shows the nonattainment and maintenance areas for the Rover and Panhandle Projects and the associated direct and indirect emissions compared to the applicability thresholds. All Rover Project compressor stations would obtain a major or minor NSR Permit. Therefore, these emissions are exempt from applicability. The modifications at existing facilities proposed by Panhandle and Trunkline would result in increased operational VOC emissions but are not subject to major or minor NSR permitting programs. Therefore, these emissions are included in the applicability analysis. Construction emissions from the Project in the nonattainment and maintenance areas, including all phases of construction and worker commuting, were conservatively considered to occur in 1 calendar year.

None of the counties in which the Trunkline Project area would be located are in a nonattainment or maintenance area. Areas designated as nonattainment or maintenance for O_3 need to be evaluated for VOC and NO_X precursors, and areas designated as nonattainment or maintenance areas for $PM_{2.5}$ need to be evaluated for $PM_{2.5}$, NO_X, and SO_2 for the Rover and Panhandle Projects.

As shown in table 4.11.1-12, emissions during construction of the Projects would not exceed General Conformity thresholds for any nonattainment or maintenance area. Therefore, a general conformity determination is not required.

State Regulations

Rover would be required to obtain a general permit (G30-D) from the WVDEP to construct and operate under 45 CSR 13 for both the Sherwood and Majorsville Compressor Stations. Rover would also be required to obtain a general permit (GP-5), general plan approval, and operating permit under Chapter 25, subchapter 127.621 from the PADEP for the Burgettstown Compressor Station. A Permit to Install or Permit to Install and Operate under OAC 3745-31 would be required from the OHEPA for the Seneca, Clarington, Cadiz, Mainline 1, Mainline 2, Mainline 3, and Defiance Compressor Stations. No permits would be necessary for operations of the Panhandle or Trunkline Projects in Illinois, Indiana, Mississippi, and Tennessee.

The following paragraphs describe state air regulations for construction and operation of the Projects.

TABLE 4.11.1-12 **Summary of Construction and Operating Emissions Subject to General Conformity Review**					
Designated Pollutant	**Designated Area**	**Pollutant or Precursor**	**Applicability Threshold (tpy)**	**Construction Emissions (tons)**	**Operating Emissions (tpy)**
Ozone	Wheeling, WV-OH	VOC	100	48.7	0.0
		NO_X	100	65.8	0.0
	Pittsburgh-Beaver Valley, PA	VOC	50	17.2	0.0
		NO_X	100	27.5	0.0
	Steubenville-Wierton, OH-WV	VOC	100	25.6	0.0
		NO_X	100	43.3	0.0
	Canton-Massillon, OH	VOC	100	10.4	0.0
		NO_X	100	29.3	0.0
	Toledo Area	VOC	100	5.4	0.0
		NO_X	100	9.5	0.0
	Detroit-Ann Arbor, MI	VOC	100	26.5	0.0
		NO_X	100	29.5	0.0
	Indianapolis, IN	VOC	100	1.6	1.3
		NO_X	100	4.7	0.0
	Ft Wayne, IN	VOC	100	0.8	0.8
		NO_X	100	2.3	0.0
$PM_{2.5}$	Wheeling, WV-OH	$PM_{2.5}$	100	84.7	0.0
		NO_X	100	65.8	0.0
		SO_2	100	2.1	0.0
	Township of Taylor S. of New Castle	$PM_{2.5}$	100	26.3	0.0
		NO_X	100	27.5	0.0
		SO_2	100	1.6	0.0
	Steubenville-Wierton, OH-WV	$PM_{2.5}$	100	38.0	0.0
		NO_X	100	43.3	0.0
		SO_2	100	1.9	0.0
	Canton-Massillon, OH	$PM_{2.5}$	100	15.1	0.0
		NO_X	100	29.3	0.0
		SO_2	100	0.3	0.0
	Detroit-Ann Arbor, MI	$PM_{2.5}$	100	62.4	0.0
		NO_X	100	29.5	0.0
		SO_2	100	0.6	0.0
	Indianapolis, IN	$PM_{2.5}$	100	0.9	0.0
		NO_X	100	4.7	0.0
		SO_2	100	N/A	0.0
PM_{10}	Vermillion Co., IN	PM_{10}	100	2.1	0.0
Sources: EPA, 2015m; 2015e N/A = not available					

West Virginia

Rover's West Virginia compressor stations and pipeline would be subject to state regulations including, but not limited to, the following (EPA, 2015g):

- 45 CSR 2 (*To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers*) establishes smoke and PM limits on fuel burning equipment;
- 45 CSR 4 (*Discharge of Air Pollutants that Cause Objectionable Odors*) for prevention and control of discharge of a pollutant into the air that causes objectionable odors;
- 45 CSR 6 (*Control of Air Pollution from Combustion of Refuse*) establishes particulate matter emission standards and requirements for refuse incineration;
- 45 CSR 7 (*To Prevent and Control Particulate Matter Air Pollution for Manufacturing Process and Associated Operations*) controls manufacturing process particulate matter;
- 45 CSR 10 (*To Prevent and Control Air Pollution from the Emission of Sulfur Oxides*) prevents sulfur oxide pollution;
- 45 CSR 13 (*Permits for Construction, Modification, Relocation and Operation of Stationary Sources, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedure for Evaluation*) establishes permitting requirements for non-major stationary sources;
- 45 CSR 16 (*Standards of Performance for New Stationary Sources*) adopts federal procedures and criteria for new stationary sources;
- 40 CSR 17 (*To Prevent and Control PM Air Pollution from Materials Handling, Preparation, Storage, and Other Sources of Fugitive PM*) establishes requirements for prevention and control of particulate pollution from fugitive sources;
- 40 CSR 20 (*Good Engineering Practices as Applicable to Stack Heights*) ensures that stack heights exceeding good engineering practice are not used for the control of an air pollution;
- 45 CSR 22 (*Air Quality Management Fee Program*) establishes fees for operating and construction permits; and
- 45 CSR 34 (*Emissions Standards for Hazardous Air Pollutants*) adopts federal procedures and criteria for hazardous air pollutants.

Pennsylvania

Rover's Burgettstown Compressor Station and pipeline would be subject to Pennsylvania state regulations, including, but not limited to, the following (PADEP, 2015b):

- 25 Pa. 121 (*General Provisions*) containing definitions, purpose applicability, prohibitions, compliance responsibilities and circumvention requirements;
- 25 Pa. 122 (*National Standards of Performance for New Stationary Source*) adopts federal procedures and criteria for new stationary sources;
- 25 Pa. 123 (*Standards for Contaminants*) prohibits certain fugitive emissions;
- 25 Pa. 124 (*National Emissions Standards for Hazardous Air Pollutants*) adopts federal procedures and criteria for hazardous air pollutants;

- 25 Pa. 127 (*Construction, Modification, Reactivation and Operation of Sources*) establishes construction and operating permit requirements;
- 25 Pa. 131 (*Ambient Air Quality Standards*) establishes maximum concentration of air contaminants; and
- 25 Pa. 135 (*Reporting*) provides means for obtaining data for evaluating effectiveness of regulations and to identify available offsets.

<u>Ohio</u>

The Ohio compressor stations would be subject to Ohio state regulations, including, but not limited to, the following (OHEPA, 2015e):

- OAC 3745-15 (*General Provisions on Air Pollution Control*) contains definitions, purpose, submission of emission information, measurement of emission of air contaminants, exemptions, malfunction, maintenance and reporting requirements, prohibitions, and circumvention requirements;
- OAC 3745-16 (*Stack Height Requirements*) establishes good engineering practice stack height requirements;
- OAC 3745-17 (*Particulate Matter Standards*) establishes particulate matter definitions, measurement methods and procedures, compliance time schedules, control of visible emissions, and restricts fugitive dust;
- OAC 3745-18 (*Sulfur Dioxide Regulations*) establishes sulfur dioxide definitions, compliance time schedules, measurement methods and procedures, ambient monitoring requirements, and emission limits by county;
- OAC 3745-19 (*Open Burning Standards*) establishes open burning standards including definitions, open burning requirement in restricted and unrestricted areas, and relationship to other prohibitions;
- OAC 3745-21 (*Carbon Monoxide, Ozone, Hydrocarbon Air Quality Standards, and Related Emissions Standards*) establishes ambient air emission standards, measurement methods, compliance time schedules, region classifications, and control methods;
- OAC 3745-23 (*Nitrogen Oxide Standards*) establishes measurement methods for NO_X;
- OAC 3745-24 (*Nitrogen Oxide Emission Statements*) established applicability, deadlines, and emission standard requirements for NO_X emission statements; and
- OAC 3745-25 (*Emergency Episode Standards*) establishes ambient air quality standards, air pollution emergency criteria and control action programs.

<u>Michigan</u>

Rover’s construction of the pipeline, and Panhandle’s modifications at the Edgerton valve site, would be subject to air quality regulations, including, but not limited to R 336 Part 3 (*Emission Limitations and Prohibitions – Particulate Matter*). This rule includes standards for density of emissions and open burning (MIDEQ, 2015b).

Illinois

Panhandle's and Trunkline's construction activities at the Tuscola, Joppa, and Johnsonville Compressor Stations would be required to comply with all applicable state regulations, including, but not limited to Title 35, Part 212 (*Visible and Particulate Matter Emissions*). This rule includes visible emission standards and limitations, and regulations of fugitive PM and control measures (ILEPA, 2015).

Indiana

Panhandle's modifications at the Montezuma and Zionsville Compressor Stations, Tuscola valve site, and Zionsville valve site would be required to comply with all applicable state regulations, including, but not limited to Title 326, Article 6 (*Particulate Rules*). This rule includes county-specific limitations and compliance schedules (INDEM, 2015).

Mississippi

Trunkline would be required to comply with all applicable state regulations, including, but not limited to 11 Mississippi Administrative Code Part 2, Chapter 1 (*Air Emission Regulations for the Prevention, Abatement, and Control of Air Contaminants*). This rule covers criteria for PM (smoke, opacity, and nuisances) and Hazardous Air Pollutants (HAP) provisions (MSDEQ, 2015).

Tennessee

Trunkline would be required to comply with all applicable state regulations, including, but not limited to 1200-3-8 (*Fugitive Dust*) and 1200-3-19 (*Emission Standards and Monitoring Requirements for Additional Control Areas*). This rule covers fugitive dust requirements and controls (TNDEC, 2015).

4.11.1.3 Air Emission Impacts and Mitigation

Construction Emissions

Construction of the Projects would result in temporary, localized increases of tailpipe emissions from mobile diesel- and gas-fueled equipment. In addition, temporary increases in fugitive dust emissions would occur due to surface disturbance caused by construction activities, construction vehicle travel on unpaved roads, and open burning. Emissions would be generated from delivery vehicles and vehicles associated with construction workers traveling to and from work sites.

Excess cleared materials may be burned, chipped, or hauled for disposal in a suitable landfill. Rover would follow each state's open-burning regulations, permitting, approval, and notification processes during such activities, including restrictions on burn locations, materials, and time, as well as consideration of local air quality. There would be no open burning for the Panhandle and Trunkline Projects.

Table 4.11.1-13 shows a summary of the applicants' estimated construction emissions for the Projects[7], including our following revisions:

[7] Detailed emission calculations were provided in Rover's supplemental filing dated October 14, 2015 (calculations revised by the FERC as indicated above), and Panhandle's and Trunkline's supplemental filings dated September 9 and October 22, 2015.

- Rover did not include the construction area for Supply Connectors A and B in its calculations for windblown dust emissions. Therefore, we added the 309.8 acres of construction work area for the Supply Connectors A and B to the calculation for windblown dust for Spread 1.
- The forested area used by Rover for open burning calculations for Carroll County, Ohio and Fulton County, Michigan did not agree with information provided in other submittals. Therefore, we revised the forested area for open burning calculations in these counties.
- Rover did not provide sufficient justification for using an annual precipitation based adjustment factor in lieu of a short-term (several weeks to months) adjustment factor to modify the emissions to account for natural mitigation (measureable rainfall). Therefore, we removed the adjustment factor.
- Rover did not provide sufficient justification for assuming the right-of-way would be subject to wind erosion **only** when the trench is open. Therefore, we revised the calculation to conservatively assume that the right-of-way is subject to wind erosion during the entire duration of each specific spread, which is based on pipeline construction progression rates.
- Rover provided open burning emission estimates using emission factors for wildfire burning. We revised the calculations to reflect prescribed burning instead.
- We updated the construction emissions to reflect Project changes submitted after the draft EIS.

TABLE 4.11.1-13

Estimated Construction Emissions (tons)

State	NO_X	VOC	CO	SO_2 **i**	PM_{10}	$PM_{2.5}$	CO_2e
West Virginia **a**	75.4	70.3	1,269.2	3.5	328.3	130.4	30,611.6
Ohio **b**	590.8	347.1	9,871.7	16.0	2,372.8	605.9	296,852.9
Pennsylvania **c**	27.5	17.2	321.8	1.6	67.9	26.3	11,641.0
Michigan **d**	29.5	26.5	495.1	0.6	252.5	62.7	16,028.6
Illinois **e**	8.5	3.1	71.4	-	8.7	1.6	4,686.5
Indiana **f**	13.7	4.7	102.7	-	13.1	2.5	7,504.5
Mississippi **g**	2.1	0.8	17.6	-	2.2	0.4	1,088.5
Tennessee **h**	2.5	0.9	20.5	-	2.2	0.4	1,376.5
Total	**751.0**	**470.6**	**9,170.2**	**21.6**	**3,047.7**	**830.3**	**369,790.0**

a West Virginia portion consists of 59.2 miles of lateral, two compressor stations, and two standalone meter stations.
b Ohio portion consists of 237.4 miles of mainline, 131.9 miles of lateral, seven new compressor stations, one modified compressor station, and five standalone meter stations.
c Pennsylvania portion consists of 10.2 miles of lateral, and one compressor station.
d Michigan portion consists of 72.0 miles of mainline, two meter stations and one modified valve site.
e Illinois portion consists of one modified meter station and three modified compressor stations.
f Indiana portion consists of two modified valve sites and two modified compressor stations.
g Mississippi portion consists of one modified compressor station.
h Tennessee portion consists of one modified compressor station.
i SO_2 data was unavailable for the Panhandle and Trunkline Projects

Construction emissions would occur over the duration of the construction period and would be emitted at different times and locations along the length of the Projects.

For all Projects, tailpipe emissions of NO_X, CO, PM_{10}, $PM_{2.5}$, SO_2, VOC, and GHGs from mobile construction equipment were calculated based on the EPA guidance on representative equipment and their typical usage levels (EPA, 2004a) and emission factors for non-road engines (EPA, 2004b; EPA, 2010; 40 CFR 89; 40 CFR 1039). GHGs were calculated based on the EPA emission factors (EPA, 2014h).

The volume of fugitive dust generated by surface disturbance and vehicle travel on unpaved roads would be dependent upon the area disturbed and the type of construction activity, along with the soil's silt and moisture content, wind speed, and the nature of vehicular/equipment traffic. Fugitive PM_{10} and $PM_{2.5}$ emissions from excavation and backfilling were calculated using EPA's *Compilation of Air Pollutant Emission Factors (AP-42)* Section 11.9 (EPA, 1998) to calculate total PM, using the assumption that PM_{10} is 52 percent of total PM (MRI, 1998), and $PM_{2.5}$ is 15 percent of PM_{10} (MRI, 1999). Windblown dust emissions were calculated using *Improvement of Specific Emission Factors* (MRI, 1996) assuming dust control efficiency of 66 percent (achieved primarily by using water trucks to apply water to the right-of-way). Fugitive PM_{10} and $PM_{2.5}$ from construction equipment on unpaved roads were calculated using the EPA's *Compilation of Air Pollutant Emission Factors (AP-42)* Section 13.2.2 (EPA, 2006).

The applicants identified several mitigation measures they would implement to reduce construction emissions and fugitive dust including:

- minimizing combustion emissions due to construction by maintaining engines in accordance with manufacturer's recommendations for fossil fuel-fired construction equipment engines;
- ensuring that mobile sources (40 CFR Part 85) and other construction equipment that have combustion engines meet engine manufacturing requirements for control of emissions;
- using water trucks at the construction sites as necessary to reduce fugitive dust; and
- limiting vehicle speeds during construction of compressor stations, meter stations, and pipeline to control fugitive dust emissions.

We find that these measures are generally effective. However, more detail is necessary because the Rover Project crosses multiple $PM_{2.5}$ nonattainment and maintenance areas, crosses multiple roads, and would be constructed near many residences. Rover filed a Fugitive Dust Control Plan (see appendix G) in March 2016, incorporating some, but not all of these measures. We find this plan insufficient. Specifically, more information regarding other mitigation measures for dust abatement in addition to spraying of water (e.g., limiting dirt/mud track-out), a description of how these measures would be implemented (e.g., identification of speed limits, usage of speed limit signage, and the conditions requiring the use of gravel at construction entrances to reduce track-out). Therefore, **we recommend that:**

- **<u>Prior to construction</u>, Rover should file with the Secretary, for review and written approval of the Director of OEP, an updated Fugitive Dust Control Plan that specifically addresses the following issues pertaining to controlling fugitive dust during construction. The plan should identify:**
  - **a. how Rover would determine that dust abatement is necessary;**
  - **b. the specific maximum speed limit for construction equipment and procedures for posting and enforcing this speed limit;**
  - **c. the site and/or construction activity conditions requiring the installation of gravel pads;**
  - **d. the track-out control devices that construction traffic would cross;**

e. **the maintenance procedures that Rover would use for construction equipment to reduce dust; and**

f. **how and under what circumstances Rover would cover open-bodied haul trucks, as appropriate.**

Operation Emissions

Emissions generated during operation of the pipeline portion of the Rover Project would be minimal and limited to emissions from maintenance equipment and CO_2e emissions. Total pipeline CO_2e emissions due to fugitive emissions from transmission and pipeline blowdown/equipment venting along the Rover pipelines would be about 15,569 tpy.

Air pollutant emissions from operation of Rover's proposed compressor stations were calculated using emissions factors from vendor data, the EPA's *Compilation of Air Pollutant Emission Factors (AP-42)* and 40 CFR 98. Fugitive GHG emissions from the pipeline were calculated using the Interstate Natural Gas Association of America's *Greenhouse Gas Emission Estimation Guidelines for Natural Gas Transmission and Storage* (INGAA, 2005). Tables 4.11.1-2 through 4.11.1-11 show estimates of CO_2e emissions by compressor station.

Operating emissions from the Panhandle and Trunkline Projects would be minimal, estimated at 1,812.8 tpy of CO_2e emissions.

Air Dispersion Modeling

As part of the air-permit applications for compressor stations, Rover utilized the EPA approved SCREEN3 air screening model[8] to identify impacts associated with each compressor station for NO_2 and $PM_{2.5}$. This model allows for scaling the impacts for other pollutants using the applicable emission rates for each pollutant, and for scaling the impacts for different averaging periods using EPA approved factors. Therefore, we used Rover's analysis for 1-hour NO_2 to estimate impacts of annual NO_2, CO, SO_2, $PM_{2.5}$ and PM_{10}. Table 4.11.1-14 provides the current ambient monitored data, the Project impact, the combined concentration, and a comparison with the NAAQS for all these pollutants, except for SO_2. For 1-hour SO_2, the Project impacts were below the Significant Impact Level of 7.8 micrograms per cubic meter ($\mu g/m^3$) at all compressor stations, therefore the Project would not cause or contribute to an exceedance of the 1-hour SO_2 NAAQS.

Results demonstrate that the Rover Project compressor stations would not exceed the NAAQS and the Project areas would continue to remain protective of human health and public welfare for all listed pollutants.

The modifications to the existing facilities for the Panhandle and Trunkline Projects would not cause an increase in any criteria pollutants; therefore, no air dispersion modeling was done for these Projects.

[8] While AERSCREEN is the current EPA preferred screening tool, SCREEN3 is an EPA approved screen tool that overestimates impacts.

TABLE 4.11.1-14

Air-Dispersion Modeling Results for Compressor Stations Along the Rover Pipeline Project

Pollutant	Averaging Period	Background ($\mu g/m^3$) a	Project Impact ($\mu g/m^3$)	Project Impact + Background ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
OHIO					
Clarington					
NO_2	1-hour	66.0	66.9	132.9	188
NO_2	Annual	66.7	5.4	72.1	100
$PM_{2.5}$ b	24-hour	24.3	2.4	29.7	35
$PM_{2.5}$ b	Annual	10.6	0.5	11.1	12
PM_{10}	24-hour	126.7	2.4	129.1	150
CO	1-hour	1.925.9	34.1	1960.0	40,000
CO	8-hour	1,518.5	23.9	1524.4	10,000
Cadiz					
NO_2	1-hour	73.0	105.2	178.2	188
NO_2	Annual	40.3	8.4	48.7	100
$PM_{2.5}$ b	24-hour	24.3	3.6	28.2	35
$PM_{2.5}$ b	Annual	10.6	0.7	11.3	12
PM_{10}	24-hour	43.0	3.7	46.7	150
CO	1-hour	1,925.9	52.4	1,978.3	40,000
CO	8-hour	1,518.5	36.7	1,555.2	10,000
Defiance					
NO_2	1-hour	95.0	77.5	172.5	188
NO_2	Annual	49.7	6.2	55.9	100
$PM_{2.5}$ c	24-hour	22.7	2.5	25.2	35
$PM_{2.5}$ c	Annual	10.2	0.5	10.7	12
PM_{10} d	24-hour	36.7	2.6	39.2	150
CO	1-hour	2,666.7	42.9	2,709.6	40,000
CO	8-hour	2,407.4	30.1	2,437.5	10,000
Mainline 1					
NO_2	1-hour	72.0	94.3	166.3	188
NO_2	Annual	49.7	7.5	57.2	100
$PM_{2.5}$ b	24-hour	24.3	3.0	27.3	35
$PM_{2.5}$ b	Annual	10.6	0.6	11.2	12
PM_{10}	24-hour	43.0	3.0	46.0	150
CO	1-hour	1,925.9	53.0	1,978.9	40,000
CO	8-hour	1,518.5	37.1	1,555.6	10,000
Mainline 2					
NO_2	1-hour	95.0	91.3	186.3	188
NO_2	Annual	49.7	7.3	57.0	100
$PM_{2.5}$ e	24-hour	22.3	2.9	25.2	35
$PM_{2.5}$ e	Annual	10.0	0.6	10.6	12

TABLE 4.11.1-14 (continued)

Air-Dispersion Modeling Results for Compressor Stations Along the Rover Pipeline Project

Pollutant	Averaging Period	Background ($\mu g/m^3$) a	Project Impact ($\mu g/m^3$)	Project Impact + Background ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
PM_{10}	24-hour	126.7	3.0	129.7	150
CO	1-hour	1,925.9	50.5	1,976.4	40,000
CO	8-hour	1.518.5	35.3	1,553.8	10,000
Mainline 3					
NO_2	1-hour	95.0	88.0	183	188
NO_2	Annual	49.7	7.0	56.7	100
$PM_{2.5}$ c	24-hour	22.7	2.8	25.5	35
$PM_{2.5}$ c	Annual	10.2	0.6	10.8	12
PM_{10}	24-hour	26.7	2.8	29.5	150
CO	1-hour	1,592.6	49.1	1,641.7	40,000
CO	8-hour	1,074.1	34.4	1,108.5	10,000
Seneca					
NO_2	1-hour	72.0	70.1	142.1	188
NO_2	Annual	40.3	5.6	45.9	100
$PM_{2.5}$ b	24-hour	24.3	2.5	26.8	35
$PM_{2.5}$ b	Annual	10.6	0.5	11.1	12
PM_{10}	24-hour	126.7	2.5	129.2	150
CO	1-hour	1,925.9	35.0	1,960.9	40,000
CO	8-hour	1,518.5	24.5	1,543.0	10,000
PENNSYLVANIA					
Burgettstown					
NO_2	1-hour	72.0	92.6	164.6	188
NO_2	Annual	39.8	7.4	47.2	100
$PM_{2.5}$	24-hour	15.7	3.1	18.8	35
$PM_{2.5}$	Annual	6.9	0.6	7.5	12
PM_{10}	24-hour	36.7	3.5	40.2	150
CO	1-hour	1,703.7	42.1	1,745.8	40,000
CO	8-hour	1,037.0	29.5	1,066.5	10,000
WEST VIRGINIA					
Majorsville					
NO_2	1-hour	72.0	31.9	104.0	188
NO_2	Annual	39.8	2.6	42.4	100
$PM_{2.5}$	24-hour	24.3	1.1	25.4	35
$PM_{2.5}$	Annual	10.6	0.2	10.8	12
PM_{10}	24-hour	42.7	1.2	43.9	150
CO	1-hour	1,074.1	44.8	1,118.9	40,000
CO	8-hour	925.9	31.3	957.2	10,000
Sherwood					
NO_2	1-hour	72.0	52.6	124.6	188

TABLE 4.11.1-14 (continued)

Air-Dispersion Modeling Results for Compressor Stations Along the Rover Pipeline Project

Pollutant	Averaging Period	Background (μg/m³) a	Project Impact (μg/m³)	Project Impact + Background (μg/m³)	NAAQS (μg/m³)
NO_2	Annual	39.8	4.2	44.0	100
$PM_{2.5}$	24-hour	22.0	1.8	23.8	35
$PM_{2.5}$	Annual	10.3	0.4	10.7	12
PM_{10}	24-hour	42.7	1.8	44.5	150
CO	1-hour	1,047.1	26.2	1,073.3	40,000
CO	8-hour	925.9	18.3	944.2	10,000

Source: EPA, 2014g, 2015f

a Background data is the average concentration at the closest monitoring station for the years 2011 through 2013, except as indicated by footnote.

b FERC revised data from Rover's April 2015 supplemental filing to use EPA monitoring site ID 540690010, which is more representative of the Clarington, Cadiz, Mainline 1, and Seneca compressor station Project area for $PM_{2.5}$.

c FERC revised data from Rover's April 2015 supplemental filing to use EPA monitoring site ID 390030009, which is more representative of the Defiance and Mainline 3 compressor station Project area for $PM_{2.5}$.

d FERC used data from EPA monitoring site ID 39003007 for the years 2009 through 2011 as the most representative PM_{10} data for the Defiance compressor station Project area.

e FERC revised data from Rover's April 2015 supplemental filing to use EPA monitoring site ID 391030004, which is more representative of the Mainline 2 compressor station Project area for $PM_{2.5}$.

Greenhouse Gas Emissions

Although the GHG emissions for construction and operation of the Projects appear large, the emissions are very small in comparison to the GHG emissions for each of state. The Projects' GHG emissions compared to the GHG emissions for each state are shown in table 4.11.1-15.

No state or regional GHG emission reduction initiatives were identified or are applicable to any of the Project activities. However, Rover has committed to minimizing venting of natural gas during start-up, shut-down, and malfunctions using preventative maintenance and standard operating procedures.

Radon Exposure

We received comments concerning the risk of radon exposure associated with the burning of natural gas sourced from Pennsylvania Marcellus Shale. We have recently evaluated general background information, studies, and literature on radon in natural gas in several past project EISs. These studies include samples taken at well sites, pre-processing, post processing, and transmission pipelines; and the recent PADEP's Technologically Enhanced Naturally Occurring Radioactive Materials Study Report issued in January 2015 (PADEP, 2015a). This PADEP report is consistent with past studies, which identify indoor radon concentrations ranging from 0.0042 picocuries per liter (pCi/L) to 0.13 pCi/L.

TABLE 4.11.1-15					
Comparison of the Projects' GHG Emissions to State-Wide GHG Emissions					
State	**State-Wide CO_2e (mmt/yr)**	**Project CO_2e (mmt/yr)**	**Percentage of State-Wide CO_2e Emissions**	**Project CO_2e (mmt/yr)**	**Percentage of State-Wide CO_2e Emissions**
		Construction		**Operations**	
Pennsylvania	265.8 **a**	0.0	0.006%	0.0	0.008%
West Virginia	N/A	0.1	N/A	0.1	N/A
Ohio	254.8 **b**	0.5	0.195%	0.7	0.258%
Michigan	210.9 **c**	0.1	0.053%	0..0	0.001%
Illinois	311.9 **d**	0.0	0.002%	0.0	0.000%
Indiana	271.7 **e**	0.0	0.002%	0.0	0.000%
Mississippi	N/A	0.0	N/A	0.0	N/A
Tennessee	N/A	0.0	N/A	0.0	N/A

a Net actual emissions for the year 2010, calculated using GWPs of 21 for CH_4 and 310 for N_2O (PADEP, 2013).
b Actual emission for the year 2008, calculated using GWPs of 21 for CH_4 and 310 for N_2O (OSU, 2011).
c Actual emission for the year 2003, calculated using GWPs of 21 for CH_4 and 310 for N_2O (WRI, 2007).
d Projected emissions for the year 2016, calculated using GWPs of 21 for CH_4 and 310 for N_2O (WRI, 2007).
e Actual emission for the year 2003, calculated using GWPs of 21 for CH_4 and 310 for N_2O (WRI, 2007).
N/A = Not available (No comparable state-wide GHG emission inventories were located for West Virginia, Tennessee, or Mississippi.)
mmt/yr = million metric tons per year

In the United States, the EPA has set the indoor action level for radon at 4 pCi/L. If concentrations of radon are high enough to exceed these activity levels, the EPA recommends remedial actions, such as improved ventilation, be implemented to reduce levels below this threshold. Further, the Indoor Radon Abatement Act established the long-term goal that indoor air radon levels be equal to or better than outdoor air radon levels. The average home in the United States has a radon activity level of 1.3 pCi/L, while outdoor levels average approximately 0.4 pCi/L. Past studies demonstrate that indoor radon concentrations from Pennsylvania Marcellus Shale sourced gas would remain below the EPA action level and the Indoor Radon Abatement Act long-term goal. Therefore, we find that the risk of exposure to radon in natural gas is not significant.

Conclusion

Because pipeline construction moves through an area relatively quickly, air emissions associated with the Rover pipeline would be intermittent and short-term. Similarly, emissions associated with the modifications at existing Panhandle and Trunkline facilities would be intermittent and short-term. Construction emissions for the Projects would be minimized by the mitigation measures described above in section 4.11.1.3. Once construction activities in an area are completed, fugitive dust and construction equipment emissions would subside, and the impact on air quality due to construction would go away completely. Further, construction emissions do not exceed the General Conformity thresholds in areas of degraded air quality. Therefore, we conclude that the Projects' construction-related impacts would not result in a significant impact on local or regional air quality.

Emissions generated during operation of the pipeline portion of Rover's proposed Project would be minimal, limited to emissions from maintenance vehicles and equipment, and fugitive emissions (considered negligible for the pipeline). Rover submitted applications for construction and operation of each compressor station to the WVDEP, PADEP, and OHEPA, as appropriate. The Defiance, Mainline 1, Mainline 2, Mainline 3, and Seneca Compressor Stations would require Title V permits for operation. However, all compressor stations would be minor sources with respect to NSR. All compressor engines would use oxidation catalysts for control of formaldehyde, CO, and VOCs. Minimization of other pollutant emissions would be achieved with normal engine maintenance and the use of natural gas fuel. Modeled impacts at Rover's compressor stations were all below applicable standards. As with pipeline operations, any emissions resulting from operation of Rover's compressor stations would not have significant impacts on local or regional air quality.

Increases in emissions during the operating phase of the Panhandle and Trunkline Projects would be minimal and would not have significant impacts on local or regional air quality.

4.11.2 Noise

The noise environment can be affected both during construction and operation of facilities. Due to natural and anthropogenic influences such as weather conditions, seasonal vegetation cover, and human activity, the magnitude and frequency of environmental noise may vary considerably over the course of a day and throughout the year. Noise levels are quantified using decibels (dB), a unit of sound pressure. The A-Weighted Sound Level, expressed as dBA, is used to quantify sound and its effect on people because it puts more emphasis on frequencies in the range that humans hear best and less emphasis on frequencies that humans do not hear well.

Two standard measures that relate the time-varying quality of environmental noise to its known effect on people are the 24-hour equivalent sound level (L_{eq24}) and day-night sound level (L_{dn}). The L_{eq24} is the level of steady sound with the same total energy as the time-varying sound of interest, averaged over a 24-hour period. The L_{dn} is the L_{eq24} plus 10 dBA added to nighttime sound levels between the hours of 10 p.m. and 7 a.m. to account for a people's greater sensitivity to sound during the night. In general, the human ear's threshold of perception for noise changes is considered to be 3 dBA, and an increase of 6 dBA is considered clearly noticeable. Increases of 10 dBA are perceived as a doubling of noise (i.e., twice as loud).

4.11.2.1 Noise Regulatory Requirements

Federal Noise Regulations

In 1974, the EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin on Safety*, which evaluated the effects of environmental noise on public health and welfare (EPA, 1974). In this document, the EPA indicated that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity interference or annoyance from continuous noise. We have adopted this criterion and use it to evaluate potential noise impacts from the proposed Project facilities at NSAs such as residences, schools, or hospitals. An L_{dn} of 55 dBA is equivalent to a continuous sound level of 48.6 dBA for facilities that generate constant sound levels.

State and Local Noise Regulations

No state noise regulations have been identified in West Virginia, Ohio, Pennsylvania, or Michigan that would apply to the Rover Project during construction or operations. The county and local noise regulations applicable to Rover's Project during construction and operation are summarized in table 4.11.2-1. No county or local construction or operation noise ordinances were identified for West Virginia.

TABLE 4.11.2-1

Noise Guidelines, Standards, and Ordinances Applicable to the Rover Project during Construction and Operations

Agency	Citation	Title	Applicable during Construction	Applicable during Operations
Ohio				
City of Montgomery	City of Montgomery, Ohio Code of Ordinances, Title XIII, Chapter 132	Noise	Yes	Yes
City of Montgomery	Zoning Code, Chapter 150.0202	Nuisances Prohibited	Yes	Yes
Washington Township	Zoning Resolution, Article 13, Section 12	Noise Standards	Yes	Yes
Dover Township	Dover Township Zoning Article VI, Section 611	Objectionable, Noxious, or Dangerous Uses, Practices, or Conditions	Yes	Yes
Athens Township	Athens, Ohio – Code of Ordinances, Section 13.04.10	Unnecessary Noise	Yes	Yes
Monroe Township	Codified Ordinances of Monroe Ohio, Part 6, Chapter 632	Noise Control	Yes	Yes
Island Creek, Knox, Salem, and Springfield Townships	Jefferson, Ohio Code of Ordinances, Part 6, Section 678	Noise	Yes	Yes
Green Township	Codified Ordinances of Green, Ohio, Part 6, Chapter 648.13	Peace Disturbances	Yes	Yes
Wooster City	Codified Ordinances of Wooster, Ohio, Part 5 Chapter 509.01	Disorderly Conduct and Peace Disturbance – Permitting Excessive Noise	Yes	Yes
Pennsylvania				
Hanover Township	Township of Hanover Ordinance 109	Ordinance	Yes	Yes
Michigan				
City of Adrian	Code of Ordinances, City of Adrian Michigan, Sec. 58-149	Noise	Yes	No
Putnam Township	Putnam Township Code of Ordinances, Chapter 224	Noise	No	Yes
Freedom Township	Freedom Township General Ordinances, Chapter 6.	Noise	Yes	Yes
Township of Lima	Noise Ordinance of the Township of Lima, Ordinance No. 26	Noise Ordinance	Yes	Yes

The noise ordinances listed above vary in specifics. For example, some prohibit certain noises during specified hours of the day while others may exempt certain actions, such as construction or temporary noises. Howell Township, Michigan, requires that noise control measures for pipeline construction be identified in the permit application. All of the ordinances generally prohibit unreasonably loud or unusual noise that is disruptive to a person with normal hearing. Where a noise threshold is specified, it is usually the same or less restrictive than the FERC standard of 55 dBA L_{dn}. For construction, Rover would provide a list of the ordinances listed above to the construction contractors and would require the contractors to recognize and be familiar with the requirements.

Pipeline operation would not contribute noise and would not violate any of the noise ordinances listed above. The Burgettstown Compressor Station, located in Hanover Township in Washington County, Pennsylvania is the only compressor station located in an area with noise ordinance that may apply during operations. The Hanover Township noise ordinance prohibits "the creation of any unreasonably loud, disturbing and unnecessary noise." However, this noise ordinance does not indicate what sound level is considered unreasonably loud, disturbing, and unnecessary. Because EPA's 55 dBA L_{dn} criterion was established to prevent outdoor noise interference (e.g. does not interfere with the ability to maintain a conversation), we assume that compliance with the EPA criterion would comply with Hanover Township's noise ordinance.

The only Panhandle or Trunkline modified facilities that would be expected to have noise impacts would be at the Edgerton and Zionsville valve sites, located in Riga Township, Michigan, and Noblesville Township, Indiana, respectively. Riga Township limits noise from industrial land uses to 40 dBA between 10:00 p.m. and 6:00 a.m. as measured at the adjacent property line of any other zoning type. Riga Township also limits noise from industrial land uses at an adjacent residential property line to 45 dBA between 6:00 a.m. and 10:00 p.m. Noblesville Township limits noise in residential areas to 55 dBA (day) and 45 dBA (night) as measured at the property line.

4.11.2.2 Construction Noise Impacts and Mitigation

Pipeline construction would consist of multiple work crews at various locations along the pipeline route. Each crew's work rate would vary based on specific activities, but in general, work would progress between 3,750 to 6,350 feet per day. General pipeline and meter station construction would be conducted with standard construction equipment, including bulldozers, graders, backhoes, front-end loaders, cranes, and dump trucks, primarily limited to daytime hours. At certain locations, pipeline construction may include impact pile driving activities, which would result in maximum noise levels of approximately 101 dBA (FTA, 2006). Construction equipment would be operated on an as-needed basis during the construction phase. NSAs near the construction areas may experience an increase in noise, but the effect would be temporary and local.

Table 4.11.2-2 shows maximum predicted construction noise at various distances (250, 500, 750, and 1,000 feet) from typical pipeline and meter station construction sites, in terms of L_{eq}. The results in this table are based on the use of four gasoline- or diesel powered vehicles located at 0.25 mile intervals along the pipeline (each with a maximum noise level of 85 dBA) and a pile driver (with a maximum noise level of 101 dBA at 50 feet).

Although nighttime noise would generally not increase during construction, certain HDD activities could continue into nighttime hours. Because of this and the fact that the equipment involved in the HDDs would be stationary for an extended period of time, there is a greater potential for prolonged noise impact. Rover proposes to use the HDD method at 30 locations. The length of the activity at each HDD site would be from 2 to 8 months. Equipment on the entry side may include the drilling rig, mud pumps, generators, drilling mud mixers, shale shakers, light plants, and the driving engines associated with the equipment; as well as mobile cranes, front-end loaders, forklifts, and trucks. On the exit side, equipment may include a backhoe or bulldozer, and a generator or light plant. Actual equipment would depend on multiple variables, including site layout and configuration, and selected drilling contractor.

TABLE 4.11.2-2 **Calculated Construction Noise Levels at Various Distances from Pipeline and Meter Station Construction Sites**	
Distance from Construction Site (feet)	**Calculated Construction L_{eq} (dBA)**
250	80.9
500	75.5
750	72.7
1,000	70.9

Ambient noise measurements were conducted in the Rover Project HDD areas from February 3, 2015 through February 5, 2015. Rover first identified NSAs within 0.5 mile of the HDD entry and exit sites and then took measurements at each NSA closest to the HDD entry and exit site. The closest NSAs at each site were residences that may or may not have been inhabited (e.g., no additional information on the number, age, gender, race, or income of residents). For the HDDs proposed at Interstate 94 and Highway 50, Rover estimated the ambient noise levels at the HDD entry and exit points following procedures developed by the U.S. Department of Housing and Urban Development (HUD, 2009). Table 4.11.2-3 lists each closest NSA, its distance and direction relative to the corresponding HDD crossing, the measured ambient sound levels, and the estimated contribution from HDD activities with mitigation, as necessary, to meet the FERC standard of 55 dBA L_{dn}. The HDD noise level contribution shown in table 4.11.2-3 conservatively assumes 24-hour HDD activity. In practice, much of the HDD activity would occur only during the day, resulting in a lower L_{dn} than shown in the table.

TABLE 4.11.2-3 **Noise Analyses for the NSA Closest to each Horizontal Directional Drilling Site**					
Feature Crossed	**Distance and Direction to NSA (feet and direction)**	**Calculated Ambient L_{dn} (dBA)**	**Calculated HDD Contribution L_{dn} (dBA)**	**Calculated HDD + Ambient L_{dn} (dBA)**	**Potential Noise Increase (dBA)**
Supply Connector Line A & B					
Highway 151 (MP Entry 16.8)	1,450 SW	50.1	45.3	51.3	1.2
Highway 151 (MP Exit 16.5)	1,000 NE	50.1	44.4	51.1	1.0
Mainline					
Indian Fork (MP Entry 25.6)	1,600 NE	65.1	42.7	65.1	0.0
Indian Fork (MP Exit 24.8)	2,580 NW	49.5	38.0	49.8	0.3
Sandy Creek (MP Entry 35.7)	1,700 S	57.8	54.0	59.3	1.5
Sandy Creek (MP Exit 35.9)	1,330 NW	37.9	46.6	47.2	9.3
Interstate 77 (MP Entry 39.6)	950 WSW	56.5	54.2 a	58.5	2.0
Interstate 77 (MP Exit 39.9)	580 S	56.5	54.6	58.6	2.1
Tuscarawas River (MP Entry 41.9)	780 SE	49.7	53.5 a	55.0	5.3
Tuscarawas River (MP Exit 42.7)	830 SE	48.6	49.9	52.3	3.7

TABLE 4.11.2-3 (continued)

Noise Analyses for the NSA Closest to each Horizontal Directional Drilling Site

Feature Crossed	Distance and Direction to NSA (feet and direction)	Calculated Ambient L_{dn} (dBA)	Calculated HDD Contribution L_{dn} a (dBA)	Calculated HDD + Ambient L_{dn} (dBA)	Potential Noise Increase (dBA)
Tributaries (2) - North Fork Sugar Creek (MP Entry 53.5)	400 SW	65.3	54.2 a	65.6	0.3
Tributaries (2) - North Fork Sugar Creek (MP Exit 53.2)	800 N	54.0	42.4	54.3	0.3
Prairie Lane (MP Entry 68.3)	1,780 SSW	47.1	54.6	55.3	8.2
Prairie Lane (MP Exit 67.9)	1,400 E	46.9	48.6	50.8	3.9
Norfolk Southern Railroad (MP Entry 69.2)	400 SW	42.2	51.5 a	52.0	9.8
Norfolk Southern Railroad (MP Exit 68.9)	1,900 SSE	47.7	46.9	50.3	2.6
State Highway 3 (Columbus Road) (MP Entry 71.9)	390 N	60.3	54.5 a	61.3	1.0
State Highway 3 (Columbus Road) (MP Exit 71.6)	520 SE	64.0	54.4	64.4	0.4
U. S. Highway 30 (West Lincoln Way) (MP Entry 77.0)	1,210 S	45.5	49.9 a	51.2	5.7
U. S. Highway 30 (West Lincoln Way) (MP Exit 76.7)	900 N	56.0	51.2 a	57.2	1.2
Interstate 71 (MP Entry 91.7)	480 S	64.3	54.4 a	64.8	0.5
Interstate 71 (MP Exit 91.9)	390 NE	63.8	59.8 a	64.0	0.2
U.S. Highway 42/Railroad (MP Entry 94.6)	450 SW	55.9	54.8 a	58.4	2.5
U.S. Highway 42/Railroad (MP Exit 94.3)	600 NW	60.1	52.8 a	60.8	0.7
Black Fork Mohican River (MP Entry 95.9)	1,600 WSW	44.3	54.7	55.1	10.8
Black Fork Mohican River (MP Exit 95.5)	1,890 SE	49.9	42.1	50.6	0.7
County Route 12/Honey Creek (MP Entry 135.3)	830 SW	43.8	53.1 a	53.6	9.8
County Route 12/Honey Creek (MP Exit 135.7)	1,020 SSW	49.1	51.6	53.5	4.4
Honey Creek (MP Entry 140.6)	1,000 E	45.5	52.1	53.0	7.5
Honey Creek (MP Exit 140.4)	1,840 SW	43.7	38.9	44.9	1.2
Sandusky River (MP Entry 142.4)	580 NW	59.0	54.2 a	60.2	1.2
Sandusky River (MP Exit 142.1)	2,380 NW	59.0	54.2 a	60.2	1.2
Interstate 75 (MP Entry 170.2)	900 NW	47.8	52.3 a	53.7	5.9
Interstate 75 (MP Exit 169.6)	1,100 NNE	45.8	49.5	51.0	5.2
State Route 109/South Fork Turkeyfoot Creek (MP Entry 190.3)	1,930 SE	54.4	52.6	56.6	2.2
State Route 109/South Fork Turkeyfoot Creek (MP Exit 190.8)	400 NE	58.1	52.1 a	59.1	1.0
Maumee River (MP Entry 200.7)	550 SW	42.4	50.7 a	51.3	8.9
Maumee River (MP Exit 200.2)	650 SW	42.3	46.2	47.7	5.4

TABLE 4.11.2-3 (continued)

Noise Analyses for the NSA Closest to each Horizontal Directional Drilling Site

Feature Crossed	Distance and Direction to NSA (feet and direction)	Calculated Ambient L_{dn} (dBA)	Calculated HDD Contribution L_{dn} a (dBA)	Calculated HDD + Ambient L_{dn} (dBA)	Potential Noise Increase (dBA)
Market Segment					
State Route 52 (Austin Road) (MP Entry 62.2)	1,250 NNE	51.5	47.5	52.9	1.4
State Route 52 (Austin Road) (MP Exit 62.8)	490 NW	51.5	54.7	56.4	4.9
Interstate 94 (MP Entry 74.7 EQ)	1,350 SSE	70.4	52.9 a	70.5	0.1
Interstate 94 (MP Exit 74.3 EQ)	640 E	65.8	54.9	66.1	0.3
Portage River (MP Entry 84.5 EQ)	390 SW	44.4	53.4 a	54.0	9.6
Portage River (MP Exit 84.8 EQ)	540 SW	45.0	48.9 a	50.4	5.4
Highway 50 (MP Entry 1.5 EQ)	1,720 SW	65.6	49.4	65.7	0.1
Highway 50 (MP Exit 1)	550 NW	60.9	48.6	61.1	0.2
Sherwood Lateral					
Middle Island Creek (MP Entry 13.0)	1,020 SSW	38.4	54.0	54.1	15.7
Middle Island Creek (MP Exit 13.4)	180 SW	52.4	53.5 a	56.0	3.6
Middle Island Creek (MP Entry 23.7)	2,310 N	46.7	43.3	48.3	1.6
Middle Island Creek (MP Exit 24.2)	1,260 E	46.7	43.3	48.3	1.6
Ohio River (MP Entry 33.8)	430 NE	43.4	51.9 a	52.5	9.1
Ohio River (MP Exit 35.0)	220 NE	81.3	51.8	81.3	0.0
Clarington Lateral					
Captina Creek (MP Entry 6.0)	1,380 NE	59.6	46.4	59.9	0.3
Captina Creek (MP Exit 6.4)	1,200 SE	59.6	46.4	59.9	0.3
Interstate 70 (MP Entry 18.9)	1,180 WSW	61.3	50.2 a	61.6	0.3
Interstate 70 (MP Exit 18.5)	1,400 SE	56.9	37.0	56.9	0.0
Burgettstown Lateral					
Ohio River (MP Entry 16.8)	600 NE	63.2	53.8 a	63.6	0.4
Ohio River (MP Exit 15.5)	1,840 SE	53.1	41.7	53.4	0.3
Majorsville Lateral					
Ohio River (MP Entry 11.9)	570 E	73.5	54.2 a	73.6	0.1
Ohio River (MP Exit 12.4)	900 SSW	51.8	46.2	52.9	1.1

a Impact includes mitigation proposed by Rover to meet the FERC noise requirement of 55 dBA L_{dn}.
N, S, E, W = North, South, East, West, respectively.

Although additional NSAs exist further from each HDD site, the noise impact would be lower than those presented, due to additional noise attenuation. At many locations, the background noise levels are already above 55 dBA L_{dn}. However, with Rover's proposed mitigation measures, noise levels from the HDD activity itself would be below the FERC noise threshold of 55 dBA L_{dn}. Accordingly, at the locations where the ambient noise is above 55 dBA L_{dn}, the HDD noise contribution would not be noticeable. Where indicated in table 4.11.2-3, Rover's mitigation measures would generally include designing and installing noise barriers or enclosures at these locations such that they:[9]

- have a sound transmission class greater than 20 and, on the side facing the HDD activity, a noise reduction coefficient greater than 0.8;
- are constructed of no less than 3/4–inch plywood, lined with 2 inches of medium-weight fiberglass on the side facing the HDD activity;
- have a minimal number of cracks and gaps;
- are flush with the ground;
- block the line of sight between NSAs and HDD activities;
- have a height at least that shown in table 4.11.2-4, or higher if necessary due to elevation change; and
- are located as close to the HDD activity as possible, and no further than 40 feet from the HDD activity.

TABLE 4.11.2-4

Calculated Construction Noise Levels at the Noise Sensitive Area with Highest Noise Impact for the Rover Pipeline Project Compressor Stations

Compressor Station - NSA	Calculated Construction L_{eq} (dBA)
Mainline 1-1	63.6
Mainline 2-2	57.9
Mainline 3-1	63.6
Defiance-2	64.4
Sherwood-4	38.8
Seneca-7	64.2
Clarington-1	56.7
Majorsville-3	46.9
Cadiz-2	45.5
Burgettstown-1	59.9

Depending on the equipment used and site layout, Rover would provide additional noise control treatments as necessary to limit noise from HDD activities. Alternatively, to mitigate noise impact on the NSA, Rover has indicated it may offer compensation or the option of temporary relocation during nighttime HDD activities. However, we find this mitigation measure to be unreasonable for HDDs that require more than 1 week to complete. Rover has agreed to file noise measurements at the start of HDD operations for the locations where mitigation is needed. However, while Rover has identified noise

[9] Specific details on Rover's noise mitigation plan for HDD sites were provided as part of Rover's comments and responses to the draft EIS filed March 25, 2016 (Accession No. 20160325-5208). The noise mitigation plan can be viewed on the FERC website at http://www.ferc.gov. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20160325-5208 in the "Numbers: Accession Number" field. The noise mitigation plan is in Volume IIA, Appendix 9F, as part of the "HDD Noise Impact Report, Revision 1."

mitigation measures, it has not provided a noise analysis demonstrating the effectiveness of the proposed mitigation. Therefore, we find that noise measurements are needed at all HDD locations, and **we recommend that:**

- **Rover should file in the weekly construction status reports the following for each HDD entry and exit site:**
  a. **the noise measurements from the nearest NSA for each drill entry/exit site, obtained at the start of drilling operations;**
  b. **the noise mitigation that Rover implemented at the start of drilling operations; and**
  c. **any additional mitigation measures that Rover would implement if the initial noise measurements exceeded an L_{dn} of 55 dBA at the nearest NSA and/or increased noise is over ambient conditions greater than 10 decibels.**

Construction of compressor stations would also generate noise. Construction of these facilities would occur in daylight hours (from 7:00 a.m. to 7:00 p.m.). In general, construction activities would be conducted using typical construction equipment (i.e., backhoes, bulldozers, cranes, front-end loaders, trucks). If necessary (for example, when there are saturated soils), Rover would also use a pile driver. Rover has also stated that dynamic compaction may be required at the Cadiz and Burgettstown Compressor Station sites to level the sites.

Table 4.11.2-4 shows predicted construction noise levels at the nearest NSA for each Rover Project compressor station. Increased noise levels during construction would occur for the duration of the approximate 12-month construction period. As the distance between the construction activity and the noise receptor increase, sound levels would decrease. While construction activities could produce noise levels that would be perceptible above the ambient noise conditions, the noise increment would be short-term and localized.

To mitigate noise impacts during construction, Rover would:

- use effective engine exhaust mufflers;
- ensure engines are properly maintained; and
- install temporary noise barriers as necessary and where noise complaints are made.

Based on the analyses conducted and mitigation measures proposed, we conclude that construction of the Projects pipelines (including HDD activities), compressor stations, and meter stations would not result in significant noise impacts on NSAs.

4.11.2.3 Operation Noise Impacts and Mitigation

Pipeline Facilities

Operations of Rover's pipeline facilities would not typically cause noise impacts, except during pipeline blowdown events at mainline valve sites, which are discussed below. However, we received comments about potential impacts on residents due to low frequency sounds waves generated by high pressure natural gas flowing through a pipeline. The type of noise that commenters are concerned about are typically associated with compressor stations that include reciprocating engines. This type of compressor unit has been reported to result in a "thumping" or "pulsing" effect along the pipeline downstream from the compressor station. There are mitigation measures that can be installed at these types of compressor stations. However, the proposed compressor units at all compressor stations are turbines. Therefore, the effect commenters are concerned about would not occur.

Aboveground Facilities

Rover's sources of operational noise would include daily operation of the compressor stations and meter stations as well as infrequent blowdown events at the compressor station sites. Potential noise impacts associated with the operation of these aboveground facilities would be limited to the vicinity of the facilities.

Ambient noise measurements at the proposed compressor station sites were conducted from late December 2014 through early January 2015. Rover first identified NSAs within 1 mile of each compressor station site and then conducted ambient noise level measurements. Appendix R includes figures depicting the location of the NSAs relative to corresponding compressor station. An acoustical analysis was conducted to estimate the operational noise levels at the nearest NSAs from each compressor station. Noise generating equipment at Rover's compressor stations would include engines, gas aftercoolers, utility coolers, fuel gas regulation skids, discharge and suction piping, blowdown vents, engine air intakes, engine exhaust systems, and compressor and engine casings.

Several commentors expressed concern about noise impacts from operation of the compressor stations. Table 4.11.2-5 shows the distance and direction of all NSAs within 1 mile of each compressor station, calculated ambient L_{dn} based on measured daytime and nighttime L_{eq}, and predicted compressor station operating noise levels at the NSAs within 1 mile. The operational noise analysis includes Rover's use of its identified mitigation measures, including:

- acoustically treated compressor building walls, roofs, and doors;
- adequate silencer on compressor building ventilation, exhaust, and intake; and
- acoustical pipe insulation on discharge piping (gas cooler header).

TABLE 4.11.2-5

Noise Analyses for NSAs within 1.0 Mile of the Rover Pipeline Project Compressor Stations

NSA a	Distance and Direction to NSA (feet)	Calculated Ambient L_{dn} (dBA)	Calculated Compressor Station Contribution L_{dn} (dBA)	Calculated Compressor Station + Ambient L_{dn} (dBA)	Potential Noise Increase (dBA)
Mainline Compressor Station 1					
NSA #1	830 S	61.7	50.8	62.0	0.3
NSA #2	930 S	61.7	50.9	62.0	0.3
NSA #3	1,460 SE	61.7	49.7	62.0	0.3
NSA #4	2,200 NE	59.5	44.5	59.6	0.1
NSA #5	1,360 SW	61.7	43.8	61.8	0.1
Mainline Compressor Station 2					
NSA #1	1,230 E	62.5	51.9	62.9	0.4
NSA #2	1,830 NE	56.0	46.8	56.5	0.5
NSA #3	3,160 N	53.6	40.8	53.8	0.2
NSA #4	3,100 SW	62.5	42.1	62.5	0.0

TABLE 4.11.2-5 (continued)

Noise Analyses for NSAs within 1.0 Mile of the Rover Pipeline Project Compressor Stations

NSA a	Distance and Direction to NSA (feet)	Calculated Ambient L_{dn} (dBA)	Calculated Compressor Station Contribution L_{dn} (dBA)	Calculated Compressor Station + Ambient L_{dn} (dBA)	Potential Noise Increase (dBA)
Mainline Compressor Station 3					
NSA #1	760 N	49.5	49.3	52.4	2.9
NSA #2	1,360 NW	49.5	48.9	52.2	2.7
NSA #3	2,230 W	49.9	47.1	51.7	1.8
NSA #4	3,690 SW	49.9	41.9	50.5	0.6
NSA #5	4,830 S	57.1	38.5	57.2	0.1
NSA #6	5,220 SE	57.1	36.7	57.1	0.0
NSA #7	3,340 E	47.4	41.0	48.3	0.9
Defiance					
NSA #2	1,990 NE	68.9	44.2	68.9	0.0
NSA #2	710 SE	71.6	51.8	71.6	0.0
NSA #3	1,760 SW	59.4	43.4	59.5	0.1
NSA #4	1,640 W	59.4	45.5	59.6	0.2
Sherwood					
NSA #1	3,100 SE	41.5	22.1	41.5	0.0
NSA #2	1,430 S	41.5	32.2	42.0	0.5
NSA #3	1,410 SW	41.5	34.5	42.3	0.8
NSA #4	1,230 W	41.5	35.4	42.5	1.0
NSA #5	4,900 NW	53.2	16.5	53.2	0.0
Seneca					
NSA #1	1,230 SW	58.5	28.1	58.5	0.0
NSA #2	2,600 S	66.6	37.3	66.6	0.0
NSA #3	3,260 E	58.1	36.1	58.1	0.0
NSA #4	1,020 NE	41.4	39.1	43.4	2.0
NSA #5	2,500 N	41.4	20.2	41.4	0.0
NSA #6	1,090 NW	58.5	27.2	58.5	0.0
NSA #7	740 W	58.5	50.4	59.1	0.6
Clarington					
NSA #1	1,660 S	47.8	51.3	52.9	5.1
NSA #2	2,460 E	47.8	48.0	50.9	3.1
NSA #3	2,980 N	45.4	28.8	45.5	0.1
NSA #4	3,280 W	41.6	44.4	46.2	4.6
Majorsville					
NSA #1	1,090 SE	49.8	37.1	50.0	0.2
NSA #2	5,380 SW	56.3	10.4	56.3	0.0
NSA #3	3,220 NW	69.6	38.5	69.6	0.0
NSA #4	4,150 NE	54.9	30.8	54.9	0.0

TABLE 4.11.2-5 (continued)					
Noise Analyses for NSAs within 1.0 Mile of the Rover Pipeline Project Compressor Stations					
NSA a	**Distance and Direction to NSA (feet)**	**Calculated Ambient L_{dn} (dBA)**	**Calculated Compressor Station Contribution L_{dn} (dBA)**	**Calculated Compressor Station + Ambient L_{dn} (dBA)**	**Potential Noise Increase (dBA)**
Cadiz					
NSA #1	4,150 N	55.0	43.8	55.3	0.3
NSA #2	3,740 NE	58.0	45.6	58.2	0.2
NSA #3	4,820 E	50.6	44.8	51.6	1.0
Burgettstown					
NSA #1	1,980 S	55.4	45.8	55.9	0.5
NSA #2	2,380 SW	51.4	33.1	51.5	0.1
NSA #3	1,130 NW	54.6	44.3	55.0	0.4
NSA #4	4,280 E	56.9	37.4	56.9	0.0

a All NSAs within 1 mile of compressor stations are residences.
N, S, E, W = North, South, East, West, respectively

Ambient noise levels at some NSAs near compressor stations already experience noise above 55 dBA L_{dn}. However, as shown in table 4.11.2-5, noise level contributions from each compressor station are projected to be below the FERC criterion of 55 dBA L_{dn}. Also, noise level increases would be undetectable at NSAs for all compressor stations except the Mainline Compressor Station 3 and Clarington Compressor Station. Operation of these compressor stations would result in a noticeable increase in noise levels, but total noise levels would remain below 55 dBA L_{dn}. However, to ensure that the actual noise levels produced as a result of the Rover Project compressor stations are not significant, **we recommend that:**

- **Rover should file a noise survey with the Secretary no later than 60 days after placing each of the Rover Project compressor stations in service. If a full load condition noise survey of the entire station is not possible, Rover should instead file an interim survey at the maximum possible horsepower load and file the full load survey within 6 months. If the noise attributable to the operation of all of the equipment at any compressor station under interim or full horsepower load conditions exceeds 55 dBA L_{dn} at any nearby NSAs, Rover should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. Rover should confirm compliance with the 55 dBA L_{dn} requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

The noise generated by a meter station is generally a result of the flow-control valves from the aboveground piping, where the noise is a direct result of the pressure drop and gas flow across the valves. Ambient noise measurements for meter stations were conducted in December of 2014, March of 2015, and May of 2016. Rover first identified NSAs within a 0.5 mile of each meter station site and then conducted ambient noise level measurements. Appendix R contains the figures depicting the location of the NSAs relative to corresponding meter station locations.

An acoustical assessment was conducted by evaluating sound levels produced by a typical meter station operating at a level with the highest potential for noise at the nearest NSA (as NSAs at greater distances would experience lower sound levels). The analysis was first conducted with no mitigation measures. Then, where the contribution at an NSA was estimated to be above 55 dBA L_{dn}, Rover included mitigation measures such that each meter station achieved the 55 dBA L_{dn} standard.

Table 4.11.2-6 shows the measured ambient sound levels and the results of the acoustical assessment for the operation of the Rover meter stations at the NSA closest to the meter station. The table results include mitigation measures at the CGT, Seneca, REX, Clarington A (EQT), Clarington, Consumers, ANR, and PEPL Meter Stations. With these measures in place, noise from the operation of the meter stations would not exceed the FERC's criterion.

TABLE 4.11.2-6

Calculated Operational Noise Levels at the Noise Sensitive Area Closest to Rover's Meter Stations

Meter Station	Measured Ambient L_{dn} (dBA)	Calculated Meter Station Contribution L_{dn} (dBA)	Calculated Meter Station + Ambient L_{dn} (dBA)	Meter Station Contribution Exceeds FERC Criterion? (Y/N)	Potential Noise Increase (dBA)
Sherwood Receipt **a**	46.3	45.9	49.1	N	2.8
CGT Delivery	49.4	50.2 **b**	52.8	N	3.4
Berne Receipt	63.5	42.1	63.5	N	0.0
Seneca Receipt **a**	69.6	46.5 **c**	69.6	N	0.0
REX Delivery **a**	69.6	40.6 **c**	69.6	N	0.0
Madison	55.8	50.7	57.0	N	1.2
Clarington A (EQT) Meter Station	47.8	39.6 **c**	48.4	N	0.6
Clarington Receipt **a**	47.8	43.2 **c**	49.1	N	1.3
Gulfport Receipt	53.9	44.2	54.3	N	3.1
Majorsville Receipt	62.7	44.1	62.7	N	0.0
Cadiz Receipt **a**	60.7	34.1	60.7	N	0.0
Burgettstown Receipt **a**	54.6	47.4	55.4	N	0.8
Consumers Energy Delivery	44.3	43.9 **c**	47.1	N	2.8
ANR Delivery	71.6	40.0 **c**	71.7	N	0.1
PEPL Delivery **a**	71.6	42.6 **c**	71.7	N	0.1
Vector Delivery	48.7	48.2	51.4	N	2.7

a Meter station is located at a proposed compressor station. The noise impacts shown are for the meter station only.

b Noise level assumes Rover would apply necessary combination of ultra-low noise trims on valves, acoustical lagging/blankets on aboveground piping, and/or use of acoustically-insulated valve buildings or enclosures as mitigation such there is a 18 dBA reduction in the meter station sound level.

c Noise level assumes Rover would apply low-noise trims on valves, and acoustical lagging/blankets on aboveground piping as mitigation such there is a 10 dBA reduction in the meter station sound level.

Several comments were received about vibration or infrasonic low frequency noise from the compressor stations or pipelines. Through FERC's dispute resolution service helpline, we are aware that induced vibration, or a low frequency sound from pipelines, has occurred at a limited number of natural gas facilities in the over 300,000 miles of transmission pipeline in the Unites States. However, we are unaware of wide-scale cases of low frequency noise from natural gas transmission pipelines. With hundreds of thousands of residents near natural gas pipelines, we have seen no systemic evidence that natural gas pipelines are inducing noise effects on local residences. This appears to be an isolated issue that continues to be addressed through the dispute resolution service and landowner helpline. Further, FERC regulations require that compressor stations cannot result in a perceptible increase in vibration at nearby receptors.

The Panhandle and Trunkline modifications do not include any additional compression or significant new noise sources. Therefore, the modified facilities would not generate additional noise beyond that of existing operations.

In addition to the operational noise discussed above, pipeline blowdown events would also generate noise impacts at the mainline valve sites, and station blowdown events would generate noise at the compressor stations. Planned pipeline blowdown events can happen during inspections or maintenance and are conducted on the segment of pipeline between mainline valves, requiring a segment of pipeline to be evacuated of natural gas. The duration of a blowdown depends on factors such as the extent of the maintenance activity and the gas pressure, and would generally last between 20 minutes and 2 hours. Planned events could allow for slower gas release and be scheduled for daytime hours, thus reducing the noise impacts. Unplanned pipeline blowdowns occur only in emergency situations. Unplanned events could occur at any time, but are typically infrequent and of short duration.

Conclusion

Construction equipment for the Projects would be operated on an as-needed basis. NSAs near the construction areas may experience an increase in perceptible noise, but the effect would be temporary and local. Noise mitigation measures that would be employed during construction include the use of sound-muffling devices on engines and the installation of barriers between construction activity and NSAs. Generally, nighttime noise would not increase during construction with the exception of HDD activity. Proposed mitigation would reduce noise levels from HDD activity to below 55 dBA L_{dn}. Based on modeled noise levels, mitigation measures proposed, our recommendation regarding noise from HDDs, and the temporary nature of construction, we conclude that the Projects would not result in significant noise impacts on residents and the surrounding communities during construction.

Operation of the Rover's compressor and meter stations would not exceed the FERC criterion**.** Noise from planned or unplanned blowdown events could exceed the noise criteria but would be infrequent and of relative short duration.

Noise impacts would result from operation of Rover's pipeline facilities, compressor stations, and meter stations. Based on the analyses conducted, mitigation measures proposed, and our recommendations, we conclude that operation of Rover's Project would not result in significant noise impacts on residents and the surrounding communities.

4.12 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some incremental risk to the public due to the potential for accidental release of natural gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death. It is not listed in the International

Agency for Research on Cancer, National Toxicology Program, or by the Occupational Safety and Health Administration as a carcinogen or potential carcinogen.

Methane has an auto-ignition temperature of 1,000 °F and is flammable at concentrations between 5 percent and 15 percent in the air. Unconfined mixtures of methane in air are not explosive; however, it may ignite if there is an ignition source. However, a flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

4.12.1 Safety Standards

The DOT is mandated to provide pipeline safety under Title 49, USC Chapter 601. PHMSA's Office of Pipeline Safety administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards that set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve the required safety standard.

PHMSA ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level. The DOT provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards. A state may also act as the DOT's agent to inspect interstate facilities within its boundaries. Michigan, Ohio, and West Virginia perform inspections on interstate natural gas pipeline facilities. DOT federal inspectors perform inspections on interstate natural gas pipeline facilities in Pennsylvania, Indiana, Illinois, Tennessee, and Mississippi. However, the DOT is responsible for enforcement action in all states.

The DOT pipeline standards are published in 49 CFR Parts 190-199. Part 192 specifically addresses natural gas pipeline safety issues. Under a *Memorandum of Understanding on Natural Gas Transportation Facilities* dated January 15, 1993, between the DOT and the FERC, the DOT is recognized as having the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations require that an applicant certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection, or shall certify that it has been granted a waiver of the requirements of the safety standards by the DOT in accordance with Section 3(e) of the Natural Gas Pipeline Safety Act. The FERC accepts this certification and does not impose additional safety standards other than the DOT standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the memorandum to promptly alert the DOT. The memorandum also provides instructions for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipelines under the Commission's jurisdiction.

The FERC also participates as a member of the DOT's Technical Pipeline Safety Standards Committee, which determines if proposed safety regulations are reasonable, feasible, and practicable.

The pipeline and aboveground facilities associated with the Projects would be designed, constructed, operated, and maintained in accordance with or to exceed the DOT *Minimum Federal Safety Standards* in 49 CFR 192. These regulations, which are intended to protect the public and to prevent natural gas facility accidents and failures, include specifications for material selection and qualification; minimum design requirements; and protection of the pipeline from internal, external, and atmospheric corrosion.

Numerous commentors expressed concern about a pipeline sited near residences. The DOT defines area classifications based on population density in the vicinity of the pipeline, and specifies more rigorous safety requirements for populated areas. Pipe wall thickness and pipeline design pressures, hydrostatic test pressures, MAOP, inspection and testing of welds, and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas. The class locations unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined below:

Class 1 – Location with 10 or fewer buildings intended for human occupancy;

Class 2 – Location with more than 10 but less than 46 buildings intended for human occupancy;

Class 3 – Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12-month period; and

Class 4 – Location where buildings with four or more stories aboveground are prevalent.

In accordance with federal standards, class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. Pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock. All pipelines installed in navigable rivers, streams, and harbors must have a minimum cover of 48 inches in soil or 24 inches in consolidated rock. Rover has committed to bury its pipelines deeper in some agricultural areas (see section 4.8.4). Class locations also specify the maximum distance to sectionalized block valves (that is 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4).

Preliminary class locations for the Rover Project have been developed based on the relationship of the pipelines centerline to other nearby structures and manmade features. Where a location was identified by Rover to be near the threshold limit for that class, Rover classified that location in the next highest class. Table 4.12.1-1 shows the area classifications for the Rover Project. Approximately 81 percent of the proposed pipeline route would cross Class 1 locations, approximately 18 percent of the route would cross Class 2 locations, and only 1 percent of the route would cross Class 3 locations. No Class 4 areas would be crossed by the Rover Project.

If Rover's Project is approved, the regulations require that the pipeline be designed, at a minimum, to the appropriate Class location standards and that the spacing between the mainline valves meets the DOT requirements.

During operation of a pipeline, if a subsequent increase in population density adjacent to the right-of-way indicates a change in class location for the pipeline, Rover would be required to reduce the MAOP or replace the segment with pipe of sufficient grade and wall thickness, if required, to comply with the DOT regulations for the new class location.

TABLE 4.12.1-1

Area Classifications along the Rover Pipeline Project

Pipeline Name/Size	Start Milepost	End Milepost	Length (miles)	Class Location
Berne Lateral				
24-inch-diameter pipeline	0.0	2.3	2.3	1
	2.3	3.7	1.4	2
Burgettstown Lateral				
36-inch-diameter pipeline	0.0	7.1	6.7	1
	7.1	8.6	1.8	2
	8.6	13.5	5.0	1
	13.5	14.9	1.3	2
	14.9	16.9	2.3	3
	16.9	20.8	3.9	2
	20.8	29.4	8.7	1
	29.4	33.5	4.1	2
	33.5	35.6	2.0	1
	35.6	37.1	1.5	2
	37.1	48.3	11.2	1
	48.3	51.1	2.9	2
	51.1	51.7	0.6	1
Cadiz Lateral				
30-inch-diameter pipeline	0.0	3.4	3.5	1
CGT Lateral				
24-inch-diameter pipeline	0.0	4.7	4.7	1
	4.7	5.9	1.3	2
Clarington Lateral				
42-inch-diameter pipeline	0.0	17.8	17.9	1
	17.8	18.7	0.9	2
	18.7	18.7	0.0	3
	18.7	19.2	0.5	2
	19.2	20.7	1.5	1
	20.7	23.8	3.1	2
	23.8	32.9	9.1	1
Mainlines A and B				
42-inch-diameter pipeline	18.7	21.4	2.6	1
	21.4	23.3	1.9	2
	23.3	32.6	9.3	1
	32.6	33.7	1.2	2
	33.7	35.4	1.7	1
	35.4	35.5	0.1	3
	35.5	39.3	3.8	1

TABLE 4.12.1-1 (continued)				
Area Classifications along the Rover Pipeline Project				
Pipeline Name/Size	**Start Milepost**	**End Milepost**	**Length (miles)**	**Class Location**
	39.3	39.3	0.2	3
	39.3	40.5	1.1	1
	40.5	42.4	1.9	2
	42.4	47.6	5.2	1
	47.6	48.6	0.9	2
	48.6	48.7	<0.1	3
	48.7	49.7	1.1	2
	49.7	51.4	1.7	1
	51.4	53.1	1.9	2
	53.1	55.2	2.2	1
	55.2	56.3	1.1	2
	56.3	57.3	1.0	1
	57.3	59.4	2.1	2
	59.4	65.7	6.3	1
	65.7	67.1	1.3	2
	67.1	68.7	1.6	1
	68.7	71.8	3.1	2
	71.8	72.1	0.3	3
	72.1	72.5	0.4	2
	72.5	86.4	13.9	1
	86.4	87.1	0.8	3
	87.1	87.3	0.1	2
	87.3	87.8	0.5	1
	87.8	88.8	1.1	2
	88.8	92.5	3.7	1
	92.5	93.4	0.9	2
	93.4	94.4	1.0	3
	94.4	94.5	0.1	2
	94.5	95.4	1.0	1
	95.4	99.6	4.1	2
	99.6	102.3	2.8	3
	102.3	105.0	2.7	2
	105.0	107.7	2.7	2
	107.7	126.1	18.3	1
	126.1	126.1	<0.1	3
	126.1	202.9	76.8	1
	202.9	204.9	2.1	2
	204.9	209.4	4.5	1

TABLE 4.12.1-1 (continued) **Area Classifications along the Rover Pipeline Project**				
Pipeline Name/Size	**Start Milepost**	**End Milepost**	**Length (miles)**	**Class Location**
Majorsville Lateral				
24-inch-diameter pipeline	0.0	6.0	6.1	1
	6.1	8.2	2.2	2
	8.2	10.3	2.0	1
	10.3	10.9	0.6	2
	10.9	12.4	1.5	3
	12.4	12.8	0.4	2
	12.8	12.9	0.1	3
	12.9	16.0	3.1	2
	16.0	23.6	7.5	1
Market Segment				
42-inch-diameter pipeline	0.0	26.9	27.3	1
	26.9	29.5	2.6	2
	29.5	34.3	5.2	1
	34.3	36.1	1.2	2
	36.1	43.7	7.9	1
	43.7	46.8	3.1	2
	46.8	54.4	7.6	1
	54.4	56.1	1.7	2
	55.7	60.4	4.6	1
	60.4	63.4	2.7	2
	63.4	66.9	3.5	1
	66.9	68.7	1.8	2
	68.7	72.5	3.8	1
	72.5	73.6	1.1	2
	73.6	75.0	1.3	1
	75.0	76.6	1.6	2
	76.6	77.7	1.1	1
	77.7	80.0	2.3	2
	80.0	82.6	2.6	1
	82.6	83.2	0.6	2
	83.2	85.2	2.0	3
	85.2	87.6	2.1	2
	87.6	87.7	0.0	1
	87.7	88.0	0.3	2
	88.0	89.2	1.2	3
	89.2	89.8	0.6	2
	89.8	90.2	0.4	3
	90.2	91.6	1.5	2
	91.6	94.3	2.6	1

TABLE 4.12.1-1 (continued) **Area Classifications along the Rover Pipeline Project**				
Pipeline Name/Size	**Start Milepost**	**End Milepost**	**Length (miles)**	**Class Location**
	94.2	96.9	2.7	2
	96.9	97.6	0.7	1
	97.6	100.0	2.4	2
Seneca Lateral				
42-inch-diameter pipeline	0.0	25.6	25.7	1
Sherwood Lateral				
36-inch-diameter pipeline	0.0	26.2	27.3	1
	26.2	28.1	1.9	2
	28.1	52.3	24.9	1
Supply Connector A and B				
42-inch-diameter pipeline	0.0	18.7	18.7	1

The Pipeline Safety Improvement Act of 2002 also requires operators to develop and follow a written integrity management program that contains all the elements described in 49 CFR 192.911 and addresses the risks on each transmission pipeline segment. Specifically, the law establishes an integrity management program that applies to all high consequence areas (HCA).

The DOT published rules that define HCAs where a gas pipeline accident could do considerable harm to people and their property and requires an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate for the DOT to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area.

The HCAs may be defined in one of two ways. In the first method, an HCA includes:

- current Class 3 and 4 locations;
- any area in Class 1 or 2 locations where the potential impact radius[10] is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle[11]; or
- any area in Class 1 or 2 locations where the potential impact circle includes an identified site.

An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

---

10 The potential impact radius is calculated as the product of 0.69 and the square root of: the MAOP of the pipeline (in pounds per square inch) multiplied by the square of the pipeline diameter (in inches).

11 The potential impact circle is a circle of radius equal to the potential impact radius.

In the second method, an HCA includes any area within a potential impact circle that contains:

- 20 or more buildings intended for human occupancy; or
- an identified site.

Once a pipeline operator has determined the HCAs on its pipeline, it must apply the elements of its integrity management plan to those segments of the pipeline within the HCAs. The DOT regulations specify the requirements for the integrity management plan at Part 192.911. The HCAs for the Rover Project have been determined based on aerial photography review, field surveys, consultation with emergency response officials, and database searches. The locations of these areas are presented in table 4.12.1-2.

TABLE 4.12.1-2

Location of High consequence Areas along the Rover Pipeline Project

Pipeline Segment	Start Milepost	End Milepost	Length (miles)
Berne Lateral			
	2.7	3.4	0.7
Burgettstown Lateral			
	3.5	4.5	0.8
	4.7	5.3	0.6
	5.4	6.8	0.6
	14.2	15.5	1.3
	15.9	16.3	0.4
	26.8	27.6	0.8
	37.3	38.0	0.7
	48.7	49.2	0.6
	49.6	50.3	0.7
	51.1	51.7	0.6
Clarington Lateral			
	3.1	3.9	0.8
	5.8	6.7	0.9
	16.9	17.8	0.9
	17.9	20.1	2.2
Mainlines A and B			
	18.3	19.1	0.9
	31.5	32.2	0.6
	35.1	36.0	0.9
	38.9	39.8	0.9
	44.7	45.4	0.8
	48.1	49.1	1.1
	57.1	57.7	0.5
	60.7	61.4	0.7
	69.7	70.8	1.1

TABLE 4.12.1-2 (continued) **Location of High consequence Areas along the Rover Pipeline Project**			
Pipeline Segment	**Start Milepost**	**End Milepost**	**Length (miles)**
	69.3	69.8	0.5
	71.8	72.0	0.3
	87.0	88.0	1.0
	89.1	89.5	0.4
	93.0	93.6	0.6
	94.0	95.4	1.4
	100.7	101.5	0.8
	125.7	126.5	0.8
	139.4	140.5	1.1
	144.0	145.0	1.0
	169.4	170.4	1.0
	203.6	204.7	1.1
	209.1	209.4	0.3
Majorsville Lateral			
	10.9	12.4	1.5
	12.6	13.6	1.0
Market Segment			
	0.0	0.5	0.5
	4.1	4.8	0.8
	6.4	7.3	0.8
	13.5	14.2	0.7
	27.4	28.2	0.8
	43.7	45.1	1.4
	46.1	46.8	0.7
	52.2	52.9	0.7
	61.5	62.3	0.8
	76.0	76.5	0.4
	78.3	79.3	1.0
	83.2	84.8	1.6
	85.1	85.8	0.7
	86.2	87.8	1.3
	88.0	90.8	2.8
	95.8	96.4	0.6
	99.4	99.6	0.2
Seneca Lateral			
	0.0	1.2	1.2
	18.0	18.8	0.9

TABLE 4.12.1-2 (continued) **Location of High consequence Areas along the Rover Pipeline Project**			
Pipeline Segment	**Start Milepost**	**End Milepost**	**Length (miles)**
Sherwood Lateral			
	15.5	16.3	0.9
	32.1	32.9	0.7
	37.3	37.67	0.4

The pipeline integrity management rule for HCAs requires inspection of the pipeline every 7 years.

After construction, and as required by the DOT regulations, the pipeline facilities would be marked at line-of-sight intervals and at crossings of roads, railroads, and other key points. The markers would indicate the presence of the pipeline and provide a telephone number and address where a company representative could be reached in the event of an emergency or before any excavation in the area of the pipeline by a third-party. Rover would also participate in the "Call Before You Dig" and "One Call" programs and other related pre-excavation notification organizations in the states in which they operate. Rover would develop and employ an integrity management plan for the Project. Rover would also follow a Continuing Pipeline Surveillance Plan, which specifies procedures for performing routine surveillance of the pipeline.

The DOT prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Several commentors raised concerns about the availability of emergency personnel and materials to respond to an incident on the pipeline. Each pipeline operator must establish an emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency. Key elements of the plan would include procedures for:

- receiving, identifying, and classifying emergency events such as gas leakage, fires, explosions, and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- emergency shutdown of system and safe restoration of service;
- making personnel, equipment, tools, and materials available at the scene of an emergency; and
- protecting people first and then property, and making them safe from actual or potential hazards.

Rover would prepare an emergency response plan that would provide procedures to be followed in the event of an emergency that would meet the requirements of 49 CFR 192.615. The plan would include the procedures for communicating with emergency services departments, prompt responses for each type of emergency, logistics, emergency shut down and pressure reduction, emergency service department notification, and service restoration.

The DOT requires that each operator establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. Rover would provide the appropriate training to local emergency service personnel before the pipeline is placed in service.

4.12.2 Pipeline Accident Data

The DOT requires all operators of natural gas transmission pipelines to notify the DOT of any significant incidents and to submit a report within 30 days. Significant incidents are defined as any leaks that:

- cause a death or personal injury requiring hospitalization; or
- involve property damage of more than $50,000 in 1984 dollars.[12]

The historic pipeline accident data presented in the draft EIS used incorrect source material. The incident data presented in this section have been updated to reflect the accurate source material, and now include the 2015 reporting year. During the 20-year period from 1996 through 2015, a total of 1,312 significant incidents were reported on the more than 300,000 total miles of natural gas transmission pipelines nationwide.

Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table 4.12.2-1 provides a distribution of the causal factors, as well as the number of each incident by cause.

The dominant cause of pipeline incidents are corrosion and pipeline material, weld, or equipment failure constituting 50.9 percent of all significant incidents. The pipelines included in the data set in table 4.12.2-1 vary widely in terms of age, pipe diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline. The frequency of significant incidents is strongly dependent on pipeline age. Older pipelines have a higher frequency of corrosion incidents, since corrosion is a time-dependent process.

[12] $50,000 in 1984 dollars is approximately $112,955.73 as of May 2015 (U.S. Department of Labor, Bureau of Labor Statistics, 2015c).

TABLE 4.12.2-1 **Natural Gas Transmission Pipeline Significant Incidents by Cause (1996-2015) [a]**		
Cause	**Number of Incidents**	**Percentage b**
Corrosion	311	23.7
Excavation **c**	210	16
Incorrect Operation **d**	41	3.1
Pipeline Material, Weld, Equipment Failure, or Incorrect Operation	357	27.2
Natural Force Damage	146	11.1
Other Outside Force Damage **e**	84	6.4
All Other Causes **f**	163	12.4
TOTAL	**1,312**	**--**

a PHMSA, 2016.
b Due to rounding, column may not total 100 percent.
c Includes third-party damage.
d Damage by Operator/Contractor, incorrect equipment, installation, or valve position.
e Fire, explosion, vehicle damage, previous damage, intentional damage.
f Miscellaneous causes or unknown causes.

Table 4.12.2-2 provides a distribution of state-specific significant incident data for the past 20 years where the Projects would be located. This data shows that over the past 20 years there have been a total of 40 incidents in Pennsylvania, 18 in West Virginia, 26 in Ohio, 34 in Michigan, 28 in Illinois, 13 in Indiana, 46 in Mississippi, and 10 in Tennessee. Fifty-seven of these incidents occurred in 2014 resulting in three fatalities among all eight states.

TABLE 4.12.2-2 **Natural Gas Transmission Pipeline Significant Incidents by State (1996-2015) [a]**		
State	**Number of Incidents**	**Causes**
Illinois	28	Miscellaneous; Corrosion; Excavation Damage; Incorrect Operation; Material/Weld/Equipment Failure; Natural Force Damage; Other Outside Force Damage
Indiana	13	Corrosion; Excavation Damage; Material/Weld/Equipment Failure/Natural Force Damage/Other Outside Force Damage
Michigan	34	Miscellaneous; Corrosion; Excavation Damage; Incorrect Operation; Material/Weld/Equipment Failure; Natural Force Damage; Other Outside Force Damage
Mississippi	46	Miscellaneous; Corrosion; Excavation Damage; Incorrect Operation; Material/Weld/Equipment Failure; Natural Force Damage; Other Outside Force Damage
Ohio	26	Miscellaneous; Corrosion; Excavation Damage; Incorrect Operation; Material/Weld/Equipment Failure; Natural Force Damage; Other Outside Force Damage
Pennsylvania	40	Miscellaneous; Corrosion; Excavation Damage; Incorrect Operation; Material/Weld/Equipment Failure; Natural Force Damage; Other Outside Force Damage
Tennessee	10	Miscellaneous; Excavation Damage; Material/Weld/Equipment Failure; Natural Force Damage
West Virginia	18	Miscellaneous; Corrosion; Excavation Damage; Material/Weld/Equipment Failure; Natural Force Damage; Other Outside Force Damage

a PHMSA, 2016

The use of both an external protective coating and a cathodic protection system, required on all pipelines installed after July 1971, significantly reduces the corrosion rate compared to unprotected or partially protected pipe.

Outside forces, including excavations and natural events, are the cause in 33.5 percent of significant pipeline incidents. Table 4.12.2-3 presents information on the outside forces incidents by cause. These mostly result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms, and thermal strains; and willful damage.

TABLE 4.12.2-3

Outside Forces Incidents by Cause (1995-2014) a

Cause	Number of Incidents	Percent of all Significant Incidents b
Third-party excavation damage	172	13.1
Operator/contractor excavation damage	25	1.9
Unspecified equipment damage/previous damage	13	1.0
Heavy rain/floods	74	5.6
Earth movement	32	1.4
Lightning/temperature/high winds	27	2.1
Other/unspecified natural force	13	1.0
Vehicle (not engaged with excavation)	49	3.7
Maritime equipment, vessel adrift, fishing or maritime activity	9	0.7
Fire/explosion	9	0.7
Electrical arcing from other equipment/facility	1	0.1
Previous mechanical damage	6	0.5
Intentional damage	1	0.1
Other/unspecified outside force	9	0.7
TOTAL	**440**	**33.5**

a Excavation, Outside Forces, and Natural Force Damage from table 4.12.2-1. PHMSA, 2016.
b Due to rounding, column entrants do not equal 33.5 percent.

Older pipelines have a higher frequency of outside forces incidents partly because their location may be less well known and less well marked than newer lines. In addition, the older pipeline systems contain a disproportionate number of smaller diameter pipelines, which have a greater rate of outside forces incidents. Small diameter pipelines are more easily crushed or broken by mechanical equipment or earth movements.

Since 1982, operators have been required to participate in "One Call" public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines. The "One Call" program is a service used by public utilities and some private sector companies (for example, oil pipelines and cable television) to provide pre-construction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts.

4.12.3 Impact on Public Safety

The service incident data summarized in table 4.12.2-1 include pipeline failures of all magnitudes with widely varying consequences. Numerous commenters identify a “blast zone” of varying distances. It is unclear how commenters derived these zones. The DOT regulations define the radius of a circle within which the potential failure of a pipeline could have significant impact on people or property as the potential impact radius. Table 4.12.3-1 presents the potential impact radius for each pipeline, calculated using the methodology defined by DOT’s regulations. Although the transportation of natural gas via pipeline involves some degree of risk to the public in the event of an accident and subsequent release of gas, it is also important to examine the probabilistic level of risks for pipeline-related events.

TABLE 4.12.3-1

Potential Impact Radius

Pipeline Segment	Potential Impact Radius (feet)
Market Segment	1,100
Mainline A&B	1,100
Burgettstown Lateral	943
Supply Connectors A&B	1,100
Cadiz Lateral	786
Clarington Lateral	1,100
Majorsville, Lateral	628
Seneca Lateral	1,100
Berne Lateral	628
Sherwood Lateral	943
CGT Lateral	628

Table 4.12.3-2 presents the annual injuries and fatalities that occurred on natural gas transmission lines between 2011 and 2015. The data has been separated into employees and nonemployees to better identify a fatality rate experienced by the general public. Fatalities among the public averaged 2 per year over the 5-year period from 2011–2015.

TABLE 4.12.3-2

Average Fatalities - Natural Gas Transmission Pipelines

	Injuries		Fatalities	
Year	Employees	Public	Employees	Public
2011	1	0	0	0
2012	3	4	0	0
2013	0	2	0	0
2014	1	0	1	0
2015	12	2	6	0

Source: PHMSA, 2016

The majority of fatalities from pipelines involve local distribution pipelines. These are natural gas pipelines that are not regulated by the FERC and that distribute natural gas to homes and businesses after transportation through interstate natural gas transmission pipelines. In general, these distribution lines are smaller diameter pipes, often made of plastic or cast iron rather than welded steel, and tend to be older pipelines that are more susceptible to damage. In addition, distribution systems do not have large rights-of-way and pipeline markers common to the FERC-regulated natural gas transmission pipelines.

The nationwide totals of accidental fatalities from various manmade and natural hazards are listed in table 4.12.3-3 in order to provide a relative measure of the industry-wide safety of natural gas transmission pipelines. Direct comparisons between accident categories should be made cautiously, however, because individual exposures to hazards are not uniform among all categories. Furthermore, the fatality rate is more than 25 times lower than the fatalities from natural hazards such as lightning, tornados, floods, earthquakes, etc.

Although incidents have occurred on the nation's natural gas transmission system, the available data show that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation. From 1996 to 2015, there was a national average of 65 significant incidents, 9 injuries and 2 fatalities per year. The number of significant incidents over the more than 300,000 miles of natural gas transmission lines indicates the risk is low for an incident at any given location. The operation of the Projects would represent a slight increase in risk to the nearby public.

TABLE 4.12.3-3

Nationwide Accidental Deaths

Type of Accident	Annual Number of Deaths
All accidents	117,809
Motor vehicle	45,343
Poisoning	23,618
Falls	19,656
Injury at work **a**	5,113
Drowning	3,582
Fire, smoke inhalation, burns	3,197
Floods **b**	81
Lightning **b**	49
Tornado **b**	72
Tractor Turnover **c**	62
Natural gas distribution lines **c**	14
Natural gas transmission pipelines **c**	2

a U.S. Census Bureau, 2012
b NWS, 2013
c PHMSA, 2016

4.12.4 Terrorism

We received comments regarding concerns that the pipeline facilities could be used in a terrorist attack. Safety and security concerns have changed the way pipeline operators as well as regulators must consider terrorism, both in approving new projects and in operating existing facilities. The Office of Homeland Security is tasked with the mission of coordinating the efforts of all executive departments and agencies to detect, prepare for, prevent, protect against, respond to, and recover from terrorist attacks within the United States. The Commission, in cooperation with other federal agencies, industry trade groups, and interstate natural gas companies, is working to improve pipeline security practices, strengthen communications within the industry, and extend public outreach in an ongoing effort to secure pipeline infrastructure.

The Commission is faced with a dilemma in how much information can be offered to the public while still providing a significant level of protection to the facility. Consequently, the Commission has taken measures to limit the distribution of information to the public regarding facility design and layout location information to minimize the risk of sabotage. Energy facility design plans and location information have been removed from our website to ensure that sensitive information filed under Critical Energy Infrastructure Information is not readily available (RM02-4-000 and PL02-1-000 issued February 20, 2003).

Safety and security are important considerations in any action undertaken by the FERC. The likelihood of future acts of terrorism or sabotage occurring at the proposed facilities, or at any of the myriad natural gas pipeline or energy facilities throughout the United States, is unpredictable given the disparate motives and abilities of terrorist groups. The continuing need to construct facilities to support the future natural gas pipeline infrastructure is not diminished from the threat of any such future acts. The efforts of the Commission, the DOT, and the Office of Homeland Security to continually improve pipeline safety would minimize the risk of terrorist sabotage of the Projects to the maximum extent practical, while still meeting the country's natural gas needs.

4.13 CUMULATIVE IMPACTS

In accordance with NEPA, we considered the cumulative impacts of the Projects and other projects or actions in the area. Cumulative impacts represent the incremental effects of a proposed action when added to impacts associated with past, present, or reasonably foreseeable future projects, regardless of what agency or person undertakes such other actions. Although the individual impact of each separate project may be minor, the additive or synergistic effects of multiple projects could be significant. The direct and indirect impacts of the Projects are discussed in other sections of this EIS.

The purpose of this analysis is to identify and describe cumulative impacts that would potentially result from implementation of the Rover Project and the proposed modifications for the Panhandle and Trunkline Projects. This cumulative impacts analysis uses an approach consistent with the methodology set forth in relevant guidance (CEQ, 1997b, 2005; EPA, 1999). Under these guidelines, inclusion of actions within the analysis is based on identifying commonalities between the impacts that would result from the Projects and the impacts likely to be associated with other potential projects.

In order to avoid unnecessary discussions of insignificant impacts and projects and to adequately address and accomplish the purposes of this analysis, the cumulative impacts analysis for the Projects was conducted using the following guidelines:

- Projects and activities included in this analysis are generally those of comparable magnitude and nature of impact, and are located within the same municipalities or townships that would be affected by the proposed Projects. The analysis also includes the proposed non-jurisdictional facilities associated with the Projects.
- Another project must impact the same resource category as the Projects for there to be a cumulative impact on that resource category. For the most part, this is possible when other projects are located in the same regions or areas as the proposed Projects. The effects of more distant projects generally are not assessed because their impacts are or would be

localized and do not contribute significantly to impacts in the Projects' area(s). An exception is air quality, which can effect larger areas. Therefore, air quality was considered on a regional basis.

- The future timeframe that another planned or proposed project could result in a cumulative impact relative to the proposed Projects depends in part on whether the impacts are short-term, long-term, or permanent. Most of the impacts associated with the Projects, other than forest clearing, are short-term effects that would occur during the period of construction.
- The scope of the cumulative impact assessment depends on the availability of information about other projects. For this assessment, other projects were identified from information provided by the applicants; field reconnaissance; internet research; and communications with federal, state, and local agencies. The impacts were quantified to the extent practicable where cumulative impacts were potentially indicated. In most cases, the potential impacts could be described qualitatively but not quantitatively. This is particularly true for projects that are in the planning stage or are contingent upon economic conditions, availability of financing, or the issuance of permits.

Projects meeting one or more of the criteria listed below were considered in this cumulative analysis. These criteria define the projects' region of influence, which will be used in this analysis to describe the general area for which the projects could potentially contribute to cumulative impacts with the proposed Projects. The region of influence varies depending on the resource being discussed. Specifically, we included:

- minor projects, including residential development, small commercial development, and small transportation projects within 0.5 mile of the proposed Project area;
- major projects, include large commercial, industrial, transportation and energy development projects requiring more than 10 acres of land, within 10 miles of the proposed Project area;
- major projects within watersheds crossed by the Projects; and
- projects with potential to result in longer-term impacts on air quality (for example, natural gas pipeline compressor stations) located within an AQCR crossed by the proposed Projects.

Four types of projects that would potentially cause a cumulative impact when considered with the proposed Projects are identified in appendix S. These are: 1) Marcellus and Utica Shale development (wells and gathering systems); 2) natural gas facilities that are not under the Commission's jurisdiction; 3) other FERC-jurisdictional natural gas pipelines; and 4) other actions.

4.13.1 Shale Formation Development

Background

Several shale formations occur in the Project area, including the well-known Marcellus and Utica Shales and to a lesser extent the Antrim Shale formation. The Marcellus Shale is an approximately 385-million-year-old, organic-rich shale formation that exists beneath 145,313 square miles of Pennsylvania, southern New York, eastern Ohio, and northern West Virginia. The Utica Shale is an older formation at approximately 460 million-years-old and is over twice the size of the Marcellus Shale. The Utica Shale largely overlaps the range of Marcellus Shale at greater depths, but extends farther west into Ohio and farther north into New York. In Michigan, is the Antrim Shale, which formed approximately 360 million years ago and covers approximately 39,000 square miles of the state. Over geologic time and with the pressure and temperature associated with deep burial, oil and natural gas is generated within organic-rich shale formations.

Because shale is generally impermeable (that is, fluids do not readily flow through the formation), the oil and natural gas contained in these types of rocks cannot be economically produced using conventional well drilling and completion methods. Within the last 20 years, however, the petroleum industry has developed the horizontal drilling technique in conjunction with hydraulic fracturing (fracking), which has been in use for over 50 years, to recover natural gas from shale reservoirs. Fracking involves the injection of fluids and sand under high pressure to fracture the shale around the wellbore, thus enabling the flow of natural gas to the well. Where the Utica and Marcellus Shales overlap, the Marcellus Shale has been the first target of development since it occurs at shallower depths and is therefore easier to drill. Marcellus Shale development has focused on the formation in Pennsylvania, West Virginia, and New York, while the Utica Shale formation is a larger focus in Ohio because the Marcellus Shale is only located along the eastern edge of the state. The smaller Antrim Shale in Michigan has been the primary focus of development in that state.

The USGS has estimated that the Marcellus Shale contains about 84 trillion cubic feet of technically recoverable natural gas (Coleman et al., 2011). An additional 38 trillion cubic feet of recoverable natural gas was estimated to be locked within the Utica Shale according to USGS estimates (Schenk et al., 2012). The much smaller Antrim Shale formation was estimated to contain approximately 7 trillion cubic feet of natural gas (USGS, 2005). For comparison, in 2012, the United States consumed approximately 25.5 trillion cubic feet of natural gas (EIA, 2015a); thus, the Marcellus and Utica Shales represents a significant natural gas deposit in close proximity to the high population centers of the northeastern United States. The Marcellus region, primarily Pennsylvania and West Virginia, has seen a dramatic increase in production rising from rates of approximately 2 Bcf/d in 2010 to 15 Bcf/d by 2015 (EIA, 2015a). By comparison the harder to reach Utica Shale formation has seen production rates rise from 250 Mmcf/d to 2 Bcf/d in the same time period (EIA, 2015a). In contrast to the increasing production from the Marcellus and Utica Shale formations, the Antrim Shale is not expected to have nearly the same level of production and is in fact declining.

The EIA maintains records of energy production and usage on a national and state level. Those records document the rise in the production rates in the states where the Rover Project would be located. Although it does not identify the source of the shale gas, be it Marcellus or Utica Shale, the EIA does identify natural gas developed by “Shale Gas Wells” as a whole (EIA, 2015b). Natural gas from shale gas wells in West Virginia accounted for 547 bcf of production in 2013, which was an increase from the 344 bcf produced in the state in 2012. Pennsylvania produced 3,048 bcf from its shale gas wells in 2013, which was an increase from 2,042 bcf produced in 2012. Ohio, where gas development occurs primarily within the Utica Shale has not seen the same level in comparison to the Marcellus Shale. It produced 88 bcf in 2013, which was still a dramatic increase from the 12 bcf produced in the previous year. Michigan produced 101 bcf in 2013 which was a decline in production from the 107 bcf produced in 2012. Michigan wells are drilled to tap into the Antrim Shale formation which sits in the state’s Upper Peninsula. Although a sizeable formation, the production rates have been declining since 2007.

Natural gas production from the shale resources involves the drilling and completion of wells and construction of gathering systems and consequent rights-of-way. We received comments concerning the FERC’s jurisdiction over these “upstream” production activities. The FERC’s authority under the NGA review requirements relate only to natural gas facilities that are involved in interstate commerce. Thus, the facilities associated with the production of natural gas are not under FERC jurisdiction.

We received comments during scoping concerning the development of natural gas reserves in the Marcellus and Utica Shale. Development of shale natural gas resources is not the subject of this EIS. Production and gathering activities, and the pipelines and facilities used for these activities, are not regulated by the FERC but are overseen by the affected region’s state and local agencies with jurisdiction over the management and extraction of the Marcellus and Utica Shale gas resources. The FERC’s jurisdiction is further restricted to facilities used for the transportation of natural gas in interstate commerce, and does not typically extend to facilities used for intrastate transportation.

Although we do not examine the impacts of Marcellus and Utica Shale upstream facilities to the same extent as the Projects in this EIS, we considered the general development of the Marcellus and Utica Shale in proximity to the projects within the context of cumulative impacts in the area of the proposed Projects. A more specific analysis of Marcellus and Utica Shale upstream facilities is outside the scope of this analysis because the exact location, scale, and timing of future facilities are unknown.

4.13.2 Natural Gas Production

4.13.2.1 Wells

Impacts from natural gas production are generally neither caused by a proposed FERC infrastructure project nor are they reasonably foreseeable consequences of the Commission's approval of an infrastructure project. As such, drilling in the Marcellus and Utica Shale would continue whether the proposed Projects are approved or not, and the exact extent of such drilling is unknown in either circumstance.

As discussed in section 1.0, in order for the Commission to approve a project, it must determine whether a project is in the public convenience and necessity. This in part entails identifying whether a) there is a market demand in the delivery area for the gas and b) there are supplies in the production area that can supply the capacity of the project. In presenting its Project to the Commission, Rover has asserted that both of these factors have been met. The proposed Projects are not reliant on other projects to meet Rover's stated objectives.

Rover has suppliers that have committed to source 3.10 Bcf/d of the available 3.25 Bcf/d capacity of the proposed pipeline system; however, capacity is expected to be fully subscribed. Rover intends to operate the pipeline at the MAOP of 1,440 pounds per square inch and, as currently proposed, would not be able to increase capacity beyond the 3.25 Bcf/d to deliver additional natural gas supplies.

4.13.2.2 Pipeline Gathering Systems

Multiple FERC non-jurisdictional intrastate natural gas well interconnections and gathering facilities are either proposed, under construction, or have been constructed in counties within 10 miles of the proposed Projects. These non-jurisdictional pipeline systems gather natural gas from Marcellus and Utica Shale wells for transport to local customers or the interstate natural gas transmission system.

At least seven companies own one or more natural gas gathering system projects within the region of influence for the Projects. Two of these gathering systems would be within 0.25 mile of the proposed Projects (see also appendix S):

- The Stadler Production facility being developed by Triad Hunter LLC is located in Monroe County, Ohio. This project will receive natural gas and produced water from production wells located on a contiguous well pad. The gas will be dehydrated and injected into pipelines for transportation to facilities owned by others for further processing.
- The Berne Plant being developed by Blue Racer Midstream LLC is located in Monroe County, Ohio. The Berne Plant consists of two cryogenic natural gas processing units, the first of which entered service in January of 2015. The second cryogenic unit entered service in the second quarter of 2015.

All of the gathering system projects located within the region of influence of the Rover Project are, or would be, within EPA Region 3 or 5 and within at least one of the watersheds crossed by the Rover Project. Construction of the gathering systems would involve activities similar to construction of interstate natural gas transmission facilities, although land requirements for construction would typically be less for gathering systems due to the installation of smaller diameter pipe.

4.13.3 Non-jurisdictional Project-related Facilities

Rover has identified three aboveground facilities where power is not readily available and new powerlines would need to be installed. However, Rover is proposing 75-foot-wide permanent access roads for each of the three facilities to accommodate the need for the powerlines. Therefore, the non-jurisdictional powerlines are already accounted for within Rover's Project impacts.

4.13.4 FERC-jurisdictional Natural Gas Pipeline Projects

There are 10 planned, proposed, or existing FERC-jurisdictional natural gas transmission projects that have portions within 10 miles of the proposed Projects. In addition to the project summaries below, a description of each project is included in appendix S, and additional details regarding each project can be obtained through our website at http://www.ferc.gov/ by utilizing the docket number given for each project. (Currently the ANR East Pipeline Project, Kinder Morgan UTOPIA Project, and Kinder Morgan Utica Marcellus Texas Pipeline Project are still in the conceptual phase and have not entered into the pre-filing process with the FERC; therefore, a docket number has not been assigned).

- Spectra Energy's Nexus Gas Transmission Project (Nexus) (FERC docket no. CP16-22-000) would originate in northeastern Ohio and includes about 250 miles of large diameter pipeline capable of transporting at least 2 billion cubic feet of natural gas per day. The greenfield pipeline would extend from receipt points in eastern Ohio to interconnections with existing pipelines in southeastern Michigan. The project would use both existing and expansion capacity on the DTE Gas (formerly Michigan Consolidated Gas Company [MichCon]) transportation system and the Vector System to access Michigan markets, Chicago, and the Dawn Hub. Construction of Nexus may start in the winter of 2016 and may be completed by fall of 2017, with an anticipated in-service date of November 2017. However, the Nexus Project is still subject to Commission approval, and the exact timing of any construction is unknown at this point. Nexus would be about 7 miles from the Rover Project at its closest point (in Wood County, Ohio), but would not intersect the Rover Project.
- Spectra Energy's Ohio Pipeline Energy Network (OPEN) Project (FERC docket no. CP14-68-000) consists of about 76 miles of new 30-inch-diameter pipeline and associated pipeline support facilities in Ohio, including a new compressor station, capable of transporting 550,000 Dth/d. Also included are reverse flow modifications at existing compressor stations along Texas Eastern's (part of Spectra Energy) existing mainline in Ohio, Kentucky, Mississippi, and Louisiana. Spectra Energy's OPEN project crosses the proposed route of the Rover Project at two locations in Jefferson County, Ohio (crossing the Burgettstown lateral) and in Belmont County, Ohio (crossing the Majorsville lateral). Spectra Energy completed construction of the OPEN Project in the fall of 2015; the project was placed into service on November 17, 2015.
- Columbia's Leach XPress Project (FERC docket no. CP15-514-000) would involve construction of about 127 miles of greenfield pipeline as well as 2 loops totaling 30 miles, abandonment of 27 miles of pipeline, construction of 3 new compressor stations, and modifications at 2 existing stations. This project would increase the capacity of Columbia Gas' system by 1.5 Bcf/d and would move regional gas supplies to various markets, including

interconnections with Columbia Gulf Transmission in Leach, Kentucky. The Columbia Leach XPress Project would generally parallel the Rover Projects' Seneca Lateral for about 20 miles in Monroe and Noble Counties, Ohio. Columbia Gas anticipates construction of the Project to begin in November 2016, with a planned in-service date of November 1, 2017. However, the Leach XPress Project is still subject to Commission approval, and the exact timing of any construction is uncertain but could take place concurrently with the Rover Project (or within a period of months of each other). As discussed in section 2.2.1, Rover and Columbia have proposed to locate the Seneca Lateral and Leach XPress pipelines within the same non-exclusive easement. Both applicants have committed to coordinate construction schedules and timing of crews to minimize impacts on the environment.

- Equitrans' Ohio Valley Connector (OVC) Project (FERC docket no. CP15-41-000) would involve 50 miles of pipeline and two new compressor stations to transport approximately 900,000 Dth/d of natural gas produced in the central Appalachian Basin to interconnections with the Texas Eastern and Rockies Express pipelines. The Equitrans project would terminate about 10 miles from the Rover Project near the proposed Seneca Lateral. This project was approved by the Commission on December 20, 2015, and construction commenced in January 2016.
- Equitrans' Mountain Valley Pipeline (MVP) Project (FERC docket no. CP16-10-000) would involve the construction of about 301 miles of 42-inch-diameter pipe, which would deliver Marcellus and Utica shale natural gas from Wetzel County, West Virginia to a proposed tie-in point near the Transcontinental Gas Pipeline Company's (Transco) Zone 5 compressor station 165 in Pittsylvania County, Virginia. The MVP project would be about 7 miles from Rover's proposed Sherwood Lateral in Doddridge County, West Virginia. Pipeline construction is anticipated to begin in February 2017 with a target in-service date of December 2018. However, the MVP Project is still subject to Commission approval, and the exact timing of any construction is unknown at this point.
- TransCanada Corporation's ANR East Pipeline Project (ANR East) would include the construction of a new pipeline originating at the Cadiz Gas Plant in southeastern Ohio and terminating at the ANR Joliet Hub in Lake County, Indiana. Since ANR has not yet filed with the FERC, there is no docket number associated with this project at this time. Based on preliminary information, ANR's Project would cross Rover's proposed Mainlines A and B in Seneca and Ashland Counties in Ohio. ANR East would also parallel Mainlines A and B in Harrison and Belmont Counties in Ohio.
- Kinder Morgan's Utopia East Project would likely involve a 240-mile-long, 12-inch-diameter pipeline from Harrison County, Ohio, to Kinder Morgan's Cochin Pipeline near Riga, Michigan, where the company would then move product eastward to Windsor, Ontario, Canada. Kinder Morgan has not requested to enter the FERC's pre-filing process at this time. UTOPIA would transport previously refined or fractionated natural gas liquids (NGLs), including ethane and propane, with an initial 50,000 barrels per day (bpd) of capacity, which is expandable to more than 75,000 bpd. The UTOPIA Project would cross Rover's Mainlines A and B in Harrison County, Ohio.
- Tennessee Gas Pipeline's Abandonment and Capacity Restoration (ACR) Project (FERC docket no. CP15-88-000) and Kinder Morgan's Utica Marcellus Texas Pipeline Project involve the abandonment and conversion of over 1,000 miles of natural gas service on Tennessee Gas pipelines to NGLs. These projects would involve construction of about 200 miles of new pipeline from Louisiana to Texas, and 155 miles of new laterals in Pennsylvania, Ohio, and West Virginia. The pipeline, which would provide connectivity to major processing and fractionation hubs in the basin, would terminate in Mont Belvieu,

Texas, and have a maximum design capacity of 430,000 bpd for transporting Y-grade natural gas liquids. Construction of the ACR Project is anticipated to start in 2016 and end in June 2017. Kinder Morgan has not requested to enter the FERC's pre-filing process at this time. The projects may cross Rover Mainlines A and B in Wayne and Harrison Counties in Ohio.

- Dominion Transmission, Inc.'s Supply Header Project (SHP) (FERC docket no. CP15-555-000) would deliver up to 1.5 Bcf/d of natural gas from supply areas in West Virginia to demand areas in West Virginia, Virginia, and North Carolina. The Supply Header Project would consist of about 39 miles of 30- and 36-inch-diameter pipe. Dominion anticipates that construction of the SHP pipelines would begin in February 2017, with anticipated in-service by November 2018. However, the project is still subject to Commission approval, and the exact timing of any construction is unknown at this point. It is expected to cross Rover's Sherwood Lateral in Doddridge County, West Virginia.
- Atlantic Coast Pipeline LLC's Atlantic Coast Pipeline (ACP) Project (FERC docket no. CP15-554-000) would consist of a 564-mile-long interstate natural gas pipeline from West Virginia, through Virginia and into eastern North Carolina to meet the region's rapidly growing demand for natural gas. The pipeline has an estimated cost of between $4.5 billion and $5 billion, an initial capacity of 1.5 billion cubic feet of natural gas per day, and a target in-service date of late 2018. Natural gas would be carried through a 42-inch-diameter pipe in West Virginia and Virginia, and a 36-inch-diameter pipe in North Carolina (along with several smaller diameter laterals). Atlantic Coast Pipeline anticipates that construction of the project would begin in February 2017, with an in-service date of November 2018. However, the ACP Project is still subject to Commission approval, and the exact timing of any construction is unknown at this point. The Atlantic Coast Pipeline Project would be about 5 miles from Rover's Sherwood Lateral in Doddridge County, West Virginia.

Of these projects, the Atlantic Coast Pipeline and Supply Header Projects would be the closest to the Rover Project. The Atlantic Coast Pipeline Project originates in Harris County, West Virginia, about 5 miles south of the Sherwood Lateral in Doddridge County, West Virginia. Dominion's Supply Header pipeline route originates at the terminus of the Atlantic Coast Pipeline and takes a northern route that would cross the CGT Lateral near MP 4.0 and then parallel the route for about 0.2 mile. Dominion's proposed route would continue north and terminate about 15 miles east of Rover's Sherwood Lateral in Wetzel County, West Virginia. Based on the terminus of the Sherwood Lateral, a reroute to collocate with the Supply Header Pipeline would unnecessarily take the route east, adding additional mileage to the overall route, which would generally result in additional land impacts. The proximity and likelihood of overlapping or concurrent construction of these projects could contribute to cumulative effects in the area; therefore, Rover and Dominion/Atlantic Coast Pipeline are coordinating on construction and operation to identify and mitigate impacts.

All of the FERC-jurisdictional projects would be constructed and maintained in accordance with our approved procedures and other construction, operation, and mitigation measures that may be required by federal, state, or local permitting authorities, further reducing the potential for cumulative impacts.

4.13.5 Other Projects

4.13.5.1 Electric Generation and Transmission Projects

There are three proposed electric generation projects within 10 miles of the Rover Project. As of October 2014, the Robinson Power Company Beech Hollow Energy Project changed course from a proposed 250 MW coal power plant to a 650 MW combined cycle gas turbine (CCGT) plant to be built in

Washington County, Pennsylvania. The project remains in its early stages, and both funding and permits have yet to be secured.

Two additional projects are currently known to be in the permitting phase. First, Moundsville Power LLC is proposing to build a 549 MW combined-cycle natural gas power plant in Marshall County, West Virginia. The Moundsville project intends to use natural gas from nearby supply lines to fuel two combustion turbine generators. The resulting electricity generated by these generators would then be sold to the local PJM Interconnection System via existing transmission lines. The power generated on the site would be enough to power approximately 549,000 homes. The other project is a proposed wind farm. Capital Power Corporation's Black Fork Wind Energy Project in Richland, Ohio is proposing to build up to 91 turbines for a total generating capacity of approximately 200 MW. In addition to the turbines, the project would also require the construction of access roads, collection lines, substations, and operation and maintenance facilities. Capital Power is working to renew lease agreements, update environmental impact studies and seek power purchase contracts for the electricity that will be generated. Capital Power hopes to start construction by the spring of 2017.

4.13.5.2 Transportation and Commercial/Residential Development Projects

Transportation and commercial/residential development projects (see appendix S) typically consist of short-term, localized activities that require state or local approval and that BMPs would be implemented to minimize environmental impacts such as erosion and sedimentation.

Transportation Projects

The West Virginia Department of Transportation (WVDOT), Pennsylvania Department of Transportation (PADOT), Ohio Department of Transportation (OHDOT), and Michigan Department of Transportation (MIDOT) are overseeing multiple ongoing and proposed infrastructure projects in the region of influence for the Rover Project. The scopes of these smaller projects are limited to work on existing infrastructure (i.e. roadwork). Of the transportation projects with multiple locations, those that are located in counties crossed by the Rover Project were evaluated according to the guidelines and criteria established for this cumulative analysis. Of the projects that do have specific locational information, only one would intersect the Rover Project:

- The OHDOT I-75 Widening - Perrysburg to Findlay project would cross the proposed Rover Project in multiple locations in Hancock and Wood Counties in Ohio. The project, started in June 2013, is widening both directions of I-75 to accommodate three lanes of traffic. The expected completion date for the project is November 2017.

Commercial/Residential Development Projects

The applicants contacted local county planning departments to identify whether residential or commercial developments are planned near their projects. We followed up with each of the county planning departments to verify that there were no planned projects. In Wayne County, Ohio, a building was reportedly under construction at an existing welding business (Des Eck Welding). The property is within 0.5 mile of the Project, but is not crossed by the proposed route. No other planned developments were identified.

4.13.6 Potential Cumulative Impacts of the Proposed Action

The potential impacts that we consider as part of our cumulative review pertain to geology and soils; groundwater, surface water, and wetlands; vegetation; wildlife; fisheries and aquatic resources; land use, recreation, special interest areas, and visual resources; socioeconomics; cultural resources; and air quality and noise.

In the following analysis, we discuss the potential cumulative impacts associated with the general development of the shale resources in the region, nearby FERC-jurisdictional projects, state DOT projects, and energy projects. For reasons discussed above, we did not further consider more distant FERC-jurisdictional projects.

4.13.6.1 Geology and Soils

Cumulative effects on geology crossed by the proposed Projects would be limited primarily to the combined impacts of construction projects located within the same construction footprint as the proposed Projects and recently completed or concurrent construction activities along the same route as the proposed Projects. These include natural gas wells, natural gas gathering systems, energy projects, and state DOT projects. The facilities associated with the proposed Projects are expected to have a temporary, but direct impact on near-surface geology and soils. The soil stabilization and revegetation requirements included in Rover's Plan and the FERC's Plan (to be implemented by Panhandle and Trunkline) would prevent or minimize any indirect impacts. Because the direct effects would be highly localized and limited primarily to the period of construction, cumulative impacts on geology and soils would primarily occur if other projects are constructed at the same time and place as the proposed Projects. The construction of some of the projects listed in appendix S, such as the Marcellus and Utica Shale gathering systems projects, several state DOT projects, the Black Fork Wind Project, and the other FERC-jurisdictional projects, could coincide with the schedule proposed for the Projects. Several of these projects could overlap the Rover Project, including Dominion's Supply Header Project and Tennessee Gas' ACR Project. Projects that require significant excavation or grading would also have temporary, direct impacts on near-surface geology and soils, although like the proposed Projects, the duration and effect of these projects would be minimized by the implementation of erosion control and restoration measures.

Each of the states that contain shale gas resource development have specific offices within their respective environmental departments that handle the permitting as well as and enforcement of applicable laws. In each of the states, there are specific branches of local government tasked with permitting of gas resources which includes:

- In Pennsylvania – PADEP's Bureau of Oil and Gas Management;
- In West Virginia – WVDEP's Office of Oil and Gas;
- In Ohio – OHDNR's Division of Oil & Gas Resources; and
- In Michigan – MIDEQ's Office of Oil, Gas, and Minerals (OOGM).

Each organization has developed BMPs for the construction and operation of upstream oil and gas production facilities as part of their permitting process. These BMPs include erosion and sediment control practices; setback requirements from springs, wetlands, and waterbodies; wetland and waterbody crossing procedures; access road construction practices; soil amendment procedures; and right-of-way restoration measures. Implementation of these measures, in combination with the measures outlined in Rover's CMPs and the FERC Plan and Procedures would avoid or minimize cumulative impacts of shale development activities on geology and soil resources in the area of the Projects, particularly where workspaces are adjacent to each other.

Several of the other FERC-jurisdictional projects, state DOT, and energy development projects would be in close proximity or adjacent to the Rover Project for limited mileage. Since the schedule for construction of the other projects are not known at this time, we are unable to determine if any or all would be constructed at the same time as the Rover Project. However, we expect these projects would be required by the state permitting agencies to adhere to BMPs similar to those proposed by Rover, Panhandle, and Trunkline. The potential for cumulative soil impacts resulting from one or more of these projects is low and primarily temporary because construction of other pipeline facilities would generally not result in loss of soils. The single wind energy project proposed in the region of influence, the Blackfork Wind Energy Project 0.3 mile away, could result in the loss of soils due to installation of wind turbines and support structures. However, this project is relatively small, proposing to install up to 91 turbines and the supporting infrastructure. The project could result in some loss of productive soils from the additions of impervious surfaces (e.g., turbine bases and collection stations); however, these would be limited in scope. Furthermore, due to permitting requirements, it is unlikely any construction area would be left unrestored following its construction, thereby minimizing exposure of soils to erosive forces. As applicants would follow the recommended procedures and take the necessary precautions to avoid and mitigate soil impacts, the proposed Projects are not expected to significantly contribute to the potential cumulative impact on soils.

The potential for cumulative soil impacts resulting from the projects combined with the Rover, Panhandle, and Trunkline Projects is low and primarily temporary because construction of these projects would generally not result in loss of soils. Consequently, the cumulative effect of the projects on geological resources and soils would be temporary and minor.

4.13.6.2 Water Resources

Construction and operation of the Projects would likely result in only short-term impacts on water resources (see section 4.3). These impacts, such as increased turbidity, would return to baseline levels over a period of days or weeks following construction.

Groundwater

Any of the projects listed in appendix S that are within the same watershed(s) as the proposed Projects and involve ground disturbance or excavation could result in cumulative impacts on groundwater resources. This includes the proposed Projects, shale development projects, other FERC-jurisdictional projects (i.e. NGT, OPEN, Leach XPress, Ohio Valley Connector, ANR East, UTOPIA, and the ACR Projects), and the electrical generation projects. The major pipeline construction activities that could affect groundwater include the clearing of vegetation, excavation and dewatering of the trench and bore pits, soil mixing and compaction, heavy equipment and associated fuels, and hazardous material handling. Implementation of proper storage, containment, and handling procedures would minimize the chance of such releases. Rover's Spill Procedures and Panhandle and Trunkline's SPAR Plans address the preventative and mitigative measures that would be implemented to avoid or minimize the potential impacts of hazardous material spills during construction. As such, impacts from the Projects are expected to be short-term and minor. All of the major projects (such as the other FERC projects and wells and gathering lines) would be required to obtain water use and discharge permits and would implement their various SPCC Plans as mandated by federal and state agencies.

For these reasons, we anticipate that the proposed Projects would only contribute to minor and temporary cumulative impacts on groundwater.

Wetlands and Waterbodies

Generally, impacts resulting from pipeline construction across waterbodies are localized and short-term. Cumulative impacts would only occur in the event more than one project crossing the same waterbody are constructed within a similar period of time. The Rover Project would require 852 waterbody and 138 drainage feature crossings. These include 359 perennial waterbody crossings, 17 perennial drainage crossings, 311 intermittent waterbody crossings, 14 intermittent drainage crossings, 175 ephemeral waterbody crossings, 90 ephemeral drainage crossings, and 7 lake/pond crossings. The majority of these would be crossed using either the open-cut method or a dry cut method per our recommendation in section 4.3.2; however, the six major waterbodies would be crossed via the HDD method. Rover's aboveground facilities and contractor yard sites impact 13 waterbodies. The Panhandle and Trunkline Projects would not cross any waterbodies or drainage features.

Most of the projects listed in appendix S are within watersheds crossed by the Rover Project that could result in impacts on wetlands and surface waters. Several of these could be under construction during the same time as the Projects, including some of the Marcellus and Utica Shale gathering systems projects, several state DOT projects, the Black Fork Wind Project, the Dominion Supply Header Project, and the ACP Project. Thus, there is the potential that cumulative impacts could result if the Rover Project were constructed during the same time period as the other projects listed in appendix S. However, the Project would contribute little to the long-term cumulative impacts on wetlands and waterbodies because the majority of the potential impacts would be temporary and short-term. Impacts on surface waters resulting from construction of the Rover's Project would end shortly after the pipeline was installed. Also, wind energy projects and non-jurisdictional project-related facilities would likely follow BMPs similar to those proposed by Rover so as to minimize impacts on waterbodies. Other FERC regulated projects would be required to adhere to our Procedures, which minimize impacts on waterbodies and wetlands. Therefore, most of the impacts on wetlands would also be of short duration. Consequently, the cumulative effect on wetland and waterbody resources would be temporary and minor.

4.13.6.3 Vegetation

Cumulative effects on vegetation disturbed by the proposed Projects would be limited primarily to the combined impacts of construction projects located within the same region of influence (10 miles) as the Projects and recently completed or concurrent construction activities along the same route as the Projects. These include energy development projects listed in appendix S, such as Marcellus and Utica Shale gathering systems projects, the Nexus Project, Leach XPress, Dominion Supply Header Project, ACP Project, and the widening of I-75.

While the vegetation impacts of the projects discussed above and the proposed Projects would not be inconsequential, the overall impact of these projects would be considered minor in comparison to the abundance of comparable habitat in the area. The applicants would be required to restore vegetation in temporarily disturbed areas, and non-jurisdictional project-related facilities would likely be held to similar standards by state permitting agencies. The FERC-jurisdictional projects, including the Abandonment and Capacity Restoration, ACP, Leach XPress, Nexus, MVP, OPEN, OVC, Supply Header, and UTOPIA projects, would be held to the same restoration standards as Rover, Panhandle, and Trunkline.

Construction of the proposed Projects would result in both temporary and permanent impacts on vegetation. Among the temporary vegetation impacts, the most prominent would be those impacting forested vegetation that is slow to regenerate within temporary work areas, and permanent conversion of forest to grassy, open lands within Rover's permanent right-of-way (which would be regularly mowed).

In order to offset Project impacts on the 3,034 acres of forested land (of which 1,183 acres would be permanent), Rover is developing, in coordination with the FWS, a Migratory Bird Plan which would include mitigation to offset losses to forested land, including interior forest.

Implementation of Rover's Plan would promote revegetation of the right-of-way and aboveground facilities following construction. Wind energy projects, shale development, and non-jurisdictional project-related facilities would also likely be required to implement mitigation measures designed to minimize the potential for long-term erosion and resource loss, increase the stability of site conditions, and revegetate disturbed areas, thereby minimizing the degree and duration of the impacts of these projects. Thus, cumulative impacts on vegetation resulting from the proposed Projects, Marcellus and Utica Shale gathering systems projects, state DOT projects, the Black Fork Wind Project, and the other FERC-jurisdictional projects, are expected to be minor. Further, considering the limited area impacted within the region of influence and that these projects are expected to take the required precautions and mitigation measures in accordance with federal and state regulations, the incremental and cumulative effects to vegetation would be minor.

4.13.6.4 Wildlife

Cumulative effects on wildlife would occur where projects are constructed in the same general proximity and timeframe or which represent permanent or long-term loss of habitat types important to wildlife. These include the Marcellus and Utica Shale gathering systems projects, several state DOT projects, the Black Fork Wind Project, and the other FERC-jurisdictional projects listed in appendix S. Construction activities such as right-of-way and other workspace clearing and grading would result in loss of vegetation cover and soil disturbance, alteration of wildlife habitat, displacement of wildlife species from the construction zone and adjacent areas, mortality of less mobile species, and other potential indirect effects as a result of noise created by construction and human activity in the area. Overall impacts would be greatest where projects are constructed in the same timeframe and area as the proposed Projects or that have long-term or permanent impacts on the same or similar habitat types.

In general, wildlife is expected to return to affected areas following construction of the proposed Projects and other projects in the area. Clearing and grading of the construction rights-of-way for the proposed Projects and other nearby projects would result in a loss of wildlife habitat. The effect of workspace clearing on forest-dwelling wildlife species would be greater than on open habitat wildlife species since forested lands could take decades to return to pre-construction condition in areas used for temporary workspace, and would be permanently prevented from re-establishing on the permanent right-of-way. This may result in the cumulative loss of individuals of small mammal species, amphibians, reptiles, nesting birds, and non-mobile species. However, we expect that any projects constructed in the area would be required to restore some vegetation cover to the disturbed areas unless they are covered by buildings or impervious surfaces. Once the area is restored, some wildlife displaced during construction of any of the projects would return to the newly disturbed area and adjacent, undisturbed habitats after completion of construction. Additionally, given the amount of forested land that would be cleared for the Project, we are recommending that Rover develop a Forest Mitigation Plan in consultation with the applicable federal and state agencies.

The aboveground facilities associated with the Projects would result in some permanent impacts on wildlife habitat. The Nexus, ACP, and Dominion Supply Header Projects would also have associated aboveground facilities associated with their projects; however, due to the limited size of these facilities and the prevalence of similar habitats in adjacent areas, the permanent conversion of forested lands would not be a significant impact on wildlife resources within the area of the proposed Projects.

Construction of any shale development projects would also result in some long-term loss of wildlife habitat due to aboveground structures and well pads. In addition, the Black Fork Wind Project could result in mortality to bird and bat species.

Impacts on wildlife species from construction of any of the projects listed in appendix S would be local, temporary, and minor. Therefore, cumulative impacts are expected to be negligible for any individual wildlife species relative to the population in the region of influence.

4.13.6.5 Fisheries and Aquatic Resources

Cumulative impacts on fisheries and aquatic resources could occur if other projects occur within the same segment of a waterbody and have similar construction timeframes as the Rover Project or that could result in permanent or long-term impact on the same or similar habitat types. Construction and operation of the Panhandle and Trunkline Projects would not directly affect surface water resources. Therefore, no impacts on fisheries or aquatic species would result from these Projects. Construction of the projects identified in appendix S, several state DOT projects, other FERC-jurisdictional projects, and the Rover Project could result in cumulative impacts on waterbodies and fisheries if constructed on the same waterbody in a similar timeframe. These impacts may include sedimentation and turbidity, habitat alteration, stream bank erosion, fuel and chemical spills, water depletions, or entrainment or entrapment due to water withdrawals or construction crossing operations. All of the FERC-jurisdictional projects in the region of influence with similar timeframes as the Rover Project, including the ACR, Nexus, ACP, and Supply Header Projects, would be designed to minimize impacts on waterbodies, and therefore fisheries and aquatic resources, as much as possible. Any impacts on waterbodies that could not be avoided would be minimized through implementation of best management and restoration practices in accordance with the respective federal, state, and local permitting agencies. Further, we expect that the federal and state permitting agencies for the other projects would require any other applicable projects constructed in the region of influence to adhere to timing windows for construction within waterbodies.

In addition, any impacts on waterbodies, and therefore fisheries and aquatic resources, would be temporary and limited to construction of the Projects. As such, none of these impacts are expected to be cumulatively significant because of their temporary nature and the impacts avoidance and mitigation measures that would be implemented. The ensuing operation of the proposed Rover pipeline would not result in any additional impacts unless maintenance activities occur in or near streams.

4.13.6.6 Special Status Species

The species discussed in section 4.7 of this EIS could potentially be affected by construction and operation of other projects occurring within the same area as the proposed Projects. Rover, Panhandle, Trunkline, and all other companies' projects are required to consult with the appropriate federal, state, and local agencies to evaluate the types of species that may be found in the area of the projects; identify potential impacts from construction and operation of the projects to any species identified; and implement measures to avoid, minimize, or mitigate impacts on special status species and their habitat. Based on projected impacts and proposed mitigation measures, the majority of federal and state-listed endangered and threatened species were determined to be either unaffected or not adversely affected by the proposed Projects.

All federal projects are required by law to coordinate with the FWS, which will take into account regional activity and changing baseline conditions in determining the extent of impacts on a federally listed or proposed species. Non-federal projects are also required to adhere to the ESA, although the FWS has a different mechanism for evaluation and minimizing impacts. Consequently, we conclude that past and present projects in combination with the proposed Projects would have minor cumulative effects to special status species.

4.13.6.7 Land Use, Recreation, Special Interest Areas, and Visual Resources

Projects with permanent aboveground components, such as buildings, wind energy projects, residential projects, roads, and aboveground electrical transmission lines would generally have greater impacts on land use than the operational impacts of a pipeline (including gathering lines for Marcellus and Utica Shale development, the Stadler Production Facility, the Berne Plant and other FERC-jurisdictional projects) which would be buried and thus allow for most uses of the land following construction. Therefore, with the exception of aboveground facilities and the permanent right-of-way, pipeline projects typically only have temporary impacts on land use. The majority of long-term or permanent impacts on land use are associated with vegetation clearing and maintenance of the pipeline right-of-way. Vegetation within the right-of-way would be cleared during construction.

The projects listed in appendix S would disturb hundreds of additional acres of land affecting a variety of land uses. We focused our analysis of potential cumulative land use impacts on projects located close by or immediately adjacent to the proposed construction workspaces. Of the projects listed in appendix S, those with the greatest potential for impacts include the Marcellus and Utica Shale development projects, linear infrastructure facilities crossing Rover's route, the OPEN Project, the ANR East Pipeline Project and the Tennessee Gas Pipeline ACR Project.

In particular, in southeast Ohio, several past, ongoing, and future projects would be active in a reasonably short time. At this location, Spectra has recently completed construction of the OPEN Project, Rover would construct most of the supply laterals and associated aboveground facilities, several FERC-jurisdictional projects, if approved, could be constructed during the same or similar time as the Rover Project, and there are previously constructed well pads and associated pipeline that are in-service. Cumulative impacts on forested lands at this location could occur if these projects are constructed around the same time as the proposed Projects.

The OPEN Project impacted about 209 acres of agricultural lands, 590 acres of open lands, 10 acres of wetlands, and 610 acres of upland forested lands during construction; and 74 acres of agricultural lands, 186 acres of open lands, 6 acres of wetlands, and 225 acres of upland forested lands during operation[13]. The Tennessee Gas Pipeline ACR Project would impact about 105 acres of agricultural lands, 66 acres of open lands, 10 acres of wetlands, and 106 acres of upland forested lands during construction; and 36 acres of agricultural lands, 22 acres of open lands, 4 acres of wetlands, and 47 acres of upland forested lands during operation[14]. We estimate the ANR East Pipeline Project could impact 360 acres of forest land, 1,930 acres of agricultural lands, 70 acres of open lands, and 40 acres of wetlands during construction; and 160 acres of forest land, 780 acres of agricultural lands, 30 acres of open lands, and 20 acres of wetlands during operation[15].

We received several comments on the draft EIS regarding the historic Great Black Swamp area of Ohio. The Great Black Swamp was created 20,000 years ago and existed until the mid-1800s when the first significant construction of drainage systems began (Historic Perrysburg, 2016). As such, much of the agricultural land in Ohio lies within the historic footprint of the Great Black Swamp and is drained by a large system of drain tiles.

The majority of the Rover Project's potential impacts on agricultural land and other non-forested land use types would be temporary, as most land uses would be allowed to revert to prior uses following construction. Any impacts would be minimized or mitigated to the greatest extent practicable through the use of resource-specific construction plans (for example, Rover's CMPs) and consultation with federal agencies, state agencies, and landowners. It is anticipated that other projects in the region of influence

---

13 FERC's Environmental Assessment for the OPEN Project is available on the FERC's eLibrary website, located at http://ferc.gov/docs-filing/elibrary.asp, by searching Docket Number CP14-68-000 and Accession No. (20140822-4001).

14 Tennessee Gas Pipeline's application is available on the FERC's eLibrary website, located at http://ferc.gov/docs-filing/elibrary.asp, by searching Docket Number CP15-88-000 and Accession No. (20150213-5341).

15 Calculation is an estimate using land use acres for the Rover Project (see table 4.8.1-1) to develop a ratio to estimate impacts on land uses from the ANR Project.

would be required to implement similar construction and restoration practices to minimize impacts on land use. The Abandonment and Capacity Restoration and ANR Projects, as FERC-jurisdictional projects, would be required to adhere to our Plan so as to minimize impacts on land use.

Rover's Project, if built at the same time as other foreseeable future projects, could result in cumulative impacts on recreation and special-interest areas if other projects affect the same areas or feature at the same time. The Project would cross or be located near several recreation and special interest areas, including four wildlife management areas: two in West Virginia and two in Ohio; one wildlife refuge in West Virginia; two national byways; five scenic byways in Ohio; three state game areas/lands; two state parks in Ohio; two golf courses; two national scenic trails; and several trails within Pinckney Recreation Area (see table 4.8.5-1). Rover has and will continue to consult appropriate federal, state, and managing agencies to develop and implement measures to mitigate and reduce impacts on these areas as needed. Additional details are provided in section 4.8.5 of this EIS. At this time, we have not determined that any of the projects listed in appendix S would impact any of the recreation and special-use areas that would be crossed by Rover's Project at the same time as Rover's Project. However, if one or more of the projects listed in appendix S was constructed at the same time and nearby location as the Rover Project, then temporary cumulative impacts could occur in those areas. While the OPEN Project could cross some of the same recreation and special-use areas as Rover, any impacts would be separated by time, and would not occur concurrently. However, if construction were to occur consecutively, the temporary nuisance disturbances could be prolonged, resulting in a diminished quality recreational experience.

The visual character of the existing landscape is defined by historic and current land uses such as recreation, conservation, and development. The visual qualities of the landscape are further influenced by existing linear installations such as highways, railroads, pipelines, and electrical transmission and distribution lines. Within this context, the pipelines, wind farms, and electrical transmission lines listed in appendix S would have the greatest cumulative impact on visual resources in the proposed Project area. The Project would add incrementally to this impact, but the overall contribution would be relatively minor given that the majority of the Project would be buried pipeline and Panhandle and Trunkline are proposing modifications at existing facility sites. Existing vegetation around the Projects' aboveground facilities would shield surrounding areas from visual impacts. Additionally, disturbed areas would be revegetated as appropriate. Rover's Project may also include the installation of small satellite dishes at each meter station and are expected to be 4-feet-wide and 5 feet in height. Given the rural location of the meter stations and mainline valves, the number of visual receptors is limited. The impact of Marcellus and Utica Shale development activities on land use, recreation, special interest areas, and visual resources would vary widely depending on the location of specific facilities and access roads, but would be minimized to the extent possible through the appropriate state's review and permitting process. One advantage of the horizontal drilling technique used in the Marcellus and Utica Shale is that numerous wells can be drilled from a single well pad, thereby reducing the land use requirements for access roads, gathering pipelines, and individual well pads.

The assessment of visual importance of an object or area varies greatly between individuals. In particular, some may find alternate forms of energy infrastructure (i.e., windmill) appealing for its intrinsic value while others may take a tangible approach in their evaluations, making meaningful conclusions on visual resources subjective. Visual impacts associated with operation of Marcellus and Utica Shale and other natural gas development result from maintained rights-of-way for gathering lines and other pipelines, well pads, compressor stations, meter stations, and gas processing facilities. The turbines associated with the Black Fork Wind Energy's wind farm in Ohio could be almost 500-feet-tall and be visible from residences nearby the project in Crawford and Richland Counties. Construction of the turbines would require the presence of large equipment to transport and install turbines and blades, and large cranes would be brought on site to complete installation of the turbines, blades, and shaft.

Although the visual impact of the wind farm and Marcellus and Utica Shale production may be long-term, only a minor visual impact would occur due to the operation of the proposed projects, primarily resulting from the conversion of forested land to scrub-shrub or herbaceous vegetation types. Project proponents for gathering lines for Marcellus and Utica Shale development and non-jurisdictional project-related facilities would restore disturbed areas in accordance with state permitting agency requirements, thereby limiting permanent visual impacts on those areas where previously existing forest would not be allowed to reestablish within the new permanent right-of-way. The locations of any aboveground facilities for the ANR East Pipeline Project are not known and therefore visual impacts from this project cannot be reliably estimated at this time. As currently planned, the OPEN Project would involve construction of one new compressor station and four new meter stations, as well as modifications of five existing compressor stations and one existing meter station. Permanent visual impacts would also occur in developed areas where permanent structures (e.g., transmission line posts) would remain. Other recently completed or proposed project aboveground facilities would, for the most part, likely be located adjacent to an existing right-of-way (e.g., transmission line), at existing paved commercial/industrial sites, in remote locations, and/or within a permanent right-of-way. Whereas these permanent visual impacts may be locally noticed, generally they would not be inconsistent with the existing visual character of the area. Therefore, the proposed Projects' contribution to cumulative impacts on land use, recreation, special interest areas, and visual resources would mostly be limited to the construction phase and would be temporary and minor.

4.13.6.8 Socioeconomics

Present and reasonably foreseeable future projects and activities could cumulatively impact socioeconomic conditions in the region of influence for the Projects. The socioeconomic issues considered in the area of the proposed Projects were employment, housing, public services, transportation, property values, economy and tax revenues, and environmental justice.

Employment

The projects considered in this section would have cumulative effects on employment during construction if more than one project is built at the same time. Rover has estimated that the Project pipeline facilities would employ an average of 9,998 workers for the various pipeline laterals, mainlines and segments, with fluctuations as high as 14,225 workers. Local hires and local union halls would supply approximately 50 percent of the workforce for such jobs as surveyors, welders, equipment operators, and general laborers. Rover estimates that the proposed compressor station would employ between 156 and 196 workers on a regular basis during construction with fluctuations as high as 250 workers. In counties with relatively low populations, if multiple similar projects are built at the same time, the demand for workers could exceed the local supply of appropriately skilled labor. Approximately 38 new permanent employees would be hired to operate the new pipeline system, which would not have a measurable impact on the economy or employment.

Smaller impacts are expected as a result of the Panhandle and Trunkline Projects. Section 4.9.1 provides a discussion of the estimated workforce for these Projects. The peak workforce for the Panhandle and Trunkline Projects would be 320 and 240 workers, respectively, with 25 percent of the workforce expected to be local. This would represent a negligible increase in the population in the area of the Projects.

Temporary Housing

Temporary housing would be required for construction workers not drawn from the local area. Given the current vacancy rates, the number of rental housing units in the area, and the number of hotel/motel rooms available in the vicinity of the Projects, construction workers should not encounter difficulty in finding temporary housing. If construction occurs concurrently with other projects, particularly during peak tourist periods, temporary housing would still be available but may be slightly more difficult to find and/or more expensive to secure. Regardless, these effects would be temporary, lasting only for the duration of construction, and there would be no long-term cumulative impact on housing.

Infrastructure and Public Services

The cumulative impact of the proposed Projects and the other projects listed in appendix S on infrastructure and public services would depend on the number of projects under construction at one time. The small incremental demands of several projects occurring at the same time could become difficult for police, fire, and emergency service personnel to address. The problem would be temporary, occurring only for the duration of construction, and could be mitigated by the various project sponsors providing their own personnel to augment the local capacity or by providing additional funds or training for local personnel.

In addition, increased use of local roadways from multiple projects could accelerate degradation of roadways and require early replacement of road surfaces. However, Rover has committed to repairing any roadways damaged during installation of the proposed pipeline and would coordinate with local authorities regarding any project-related impacts on roads.

No long-term cumulative effect on infrastructure and public services is anticipated.

Transportation and Traffic

Construction of the proposed Projects could result in temporary impacts on road traffic in some areas and could contribute to cumulative traffic, parking, and transit impacts if other projects are scheduled to take place at the same time and in the same area. The local road and highway system in the vicinity of the proposed Projects is readily accessible by interstate highways, U.S. highways, state highways, secondary state highways, county roads, and private roads. However, portions of the Projects are located in rural areas and some of the roads impacted by the Rover Project would be county or private roads. Rover has stated that it would use major highways, as well as using the construction right-of-way to the extent practicable, to reduce impacts on local roadways.

The addition of traffic associated with construction personnel commuting to and from the Project could also contribute to cumulative regional traffic congestion. However, any construction of the proposed Project to cumulative traffic impacts would be temporary and short-term. Workers associated with the Projects would generally commute to and from the pipeline right-of-way, contractor yards, or aboveground facility sites during off-peak traffic hours (e.g., before 7:00 AM and after 6:00 PM). It is unlikely that other projects listed in appendix S would have similar commuting schedules or reach peak traffic conditions simultaneously.

Rover stated that it would further minimize impacts associated with road crossings through the creation of temporary travel lanes during construction, temporary placement of steel plate bridges to accommodate traffic during open trenching for use by fire and emergency vehicles, and implementation of its Rover's Traffic Plan. We expect other projects to develop similar procedures.

The proposed Projects would not contribute to any long-term cumulative impact on the transportation infrastructure, because only a small number of new permanent employees would be required to operate Rover's Project.

4.13.6.9 Cultural Resources

Cumulative impacts on cultural resources would only occur if other projects were to impact the same historic properties impacted by the Rover Project. The currently proposed projects listed in appendix S that are defined as federal actions (such as the OPEN Project) would include mitigation measures designed to avoid or minimize additional direct impacts on cultural resources. Where direct impacts on significant cultural resources are unavoidable, mitigation (e.g., recovery of data and curation of materials) would occur before construction. Non-federal actions would need to comply with any mitigation measures required by the affected states. The applicants developed project-specific plans to address unanticipated discoveries of cultural resources and human remains in the event they are discovered during construction. Therefore, the proposed projects may incrementally add to the cumulative effects of other projects that may occur at the same time. However, this incremental increase would not be significant.

4.13.6.10 Air Quality and Noise

Air Quality

Construction of the proposed Projects and the other projects listed in appendix S would involve the use of heavy equipment that would generate air emissions (including fugitive dust), and noise. The majority of these impacts, with the exception of HDD installation and modification of the Panhandle and Trunkline facilities, would be minimized, because the construction activities would occur over a large geographical area and would be moving regularly. The majority of emissions associated with the Projects would be temporary, resulting from construction activities, and would be minimized by mitigation measures such as using properly maintained vehicles and commercial gasoline and diesel fuel products with specifications to control pollutants.

Air emissions resulting from diesel- and gasoline-fueled construction equipment and vehicle engines for the Projects would be minimized by federal design standards required at the time of manufacture of the equipment and vehicles, and would comply with the EPA's mobile and non-road emission regulations found in 40 CFR Parts 85, 86, and 89. In addition, the applicants would further mitigate GHG emissions during construction by regularly maintaining construction equipment and complying with applicable state regulations. While fugitive dust impacts would also be temporary and not be expected to affect local or regional air quality, dust suppression techniques would be implemented in all construction work areas near residential and commercial areas to reduce potential impacts of fugitive dust emissions.

With the exception of GHG emissions, air impacts from construction of the Projects would be localized and confined primarily to the airsheds in which the activities occur. In all counties crossed, the proposed Projects' estimated emissions would be below the *de minimus* threshold for a general conformity determination, therefore impacts would not be expected to result in a significant impact on local or regional air quality. The combined effect of multiple construction projects occurring in the same airshed, ACQR, and timeframe as the proposed Projects could temporarily add to the ongoing air quality effects of existing activities. However, the contribution of the proposed Projects to the cumulative effect of all foreseeable projects would be temporary. The projects listed in appendix S have varying construction schedules and would take place over a relatively large geographic area.

It is likely that mitigation measures similar to those employed for the proposed Projects would be required for other projects to protect ambient air quality, thereby reducing the extent of cumulative impacts on air quality that could occur if projects are being constructed within the same timeframe and within the same region of influence. The construction of the Projects would not have a significant long-term adverse impact on air quality and would not add significantly to the long-term cumulative impact of other projects. It is also possible that the Rover Project could contribute to cumulative improvements in regional air quality if a portion of the natural gas associated with the Project displaces the use of other fossil fuels that may contribute greater amounts of air pollutants of concern. Construction activity associated with the Panhandle and Trunkline Projects would result in GHG, CO, PM, NO_X, and VOC emissions, with lesser amounts of SO_2 and HAP emissions from equipment as well as construction and worker vehicles. Potential impacts from diesel- and gasoline-fueled construction equipment and vehicles would be minimized by federal design standards imposed when the equipment engines were manufactured, and would comply with the EPA mobile emission regulations at 40 CFR 85. Fugitive dust emissions would be generated during excavation, by vehicles traveling on unpaved roadways, and from disturbed land surfaces. Fugitive dust emissions would be controlled by monitoring and the use of dust suppression techniques when necessary, which typically include application of water. These suppressants would be applied only in accordance with applicable regulations and the presence of nearby waterways or wetlands would be considered prior to application. Like the pipeline construction components, the compressor station emissions during construction would be temporary and would be minimized by mitigation measures described above. Impacts from construction of the proposed compressor stations are not expected to result in a significant impact on local or regional air quality.

Operation of the Rover pipeline would generate emissions from maintenance vehicles and equipment, as well as vented and fugitive GHG emissions. The various compressor stations would generate primarily GHG, NO_X, VOC, CO, HAP, and PM emissions, with a lesser amount of SO_2 emissions. However, no Rover compressor station would trigger PSD permitting requirements for any pollutant. Therefore, emissions from operation of the Rover Project are not expected to result in a significant impact on local or regional air quality.

Ongoing drilling activities of Marcellus and Utica Shale natural gas reserves and other projects in the area such as non-jurisdictional project-related facilities and Marcellus and Utica Shale development projects (see appendix S), would involve the use of heavy equipment that would generate emissions of air contaminants and fugitive dust during construction. Because pipeline construction moves through an area quickly, air emissions associated with pipelines would be intermittent and short-term. The majority of these impacts would be minimized further because the construction activities would occur over a large geographical area and, in many cases, construction schedules would not directly overlap. Although these projects would result in short-term construction air emissions, they are not likely to significantly affect long-term air quality in the region. Operation of the proposed Projects, Marcellus and Utica Shale drilling activities, other FERC-jurisdictional projects, and other nearby projects would also contribute cumulatively to existing air emissions. As with the operational impacts of the Projects, operation of other nearby, similar projects would generate emissions from maintenance vehicles and equipment, as well as vented and fugitive GHG emissions, which would contribute to cumulative impacts on air quality within the region of influence. We expect that operation of nearby, similar projects would be held to, and comply with the same permit requirements and mitigation measures to which the proposed projects would abide. At this time, Spectra is constructing a new compressor stations as part of the OPEN Project. This new compressor station is located in Belmont County, Ohio, which would be crossed by Rover's Clarington and Majorsville Laterals. We expect impacts on air quality to be similar to those described for the proposed projects (see section 4.11.1), scaled to account for differences in horsepower.

Operation of the Black Fork Wind Energy Project is not expected to contribute to air emissions in the region of influence. The project would need to comply with federal, state, and local air regulations, which may require controls to limit the emission of certain criteria pollutants or HAPs. Although outside the extent of the Commission's jurisdiction, it is anticipated that Marcellus and Utica Shale development activities would result in increased long-term emissions of criteria pollutants, HAPs, and GHGs within the region.

Climate Change

Climate change is the change in climate over time, whether due to natural variability or as a result of human activity, and cannot be represented by single annual events or individual anomalies. For example, a single large flood event or particularly hot summer are not indications of climate change, while a series of floods or warm years that statistically change the average precipitation or temperature over years or decades may indicate climate change.

The leading U.S. scientific body on climate change is the U.S. Global Change Research Program. Thirteen federal departments and agencies participate in the U.S. Global Change Research Program, which began as a presidential initiative in 1989 and was mandated by Congress in the Global Change Research Act of 1990.

In June 2009, the U.S. Global Change Research Program issued a report, *Global Climate Change Impacts in the United States*, summarizing the impacts that climate change has already had on the United States and what projected impacts climate change may have in the future. The report includes a breakdown of overall impacts by resource and impacts described for various regions of the United States. Although climate change is a global concern, for this cumulative analysis, we will focus on the potential cumulative impacts of climate change in the area of the Projects.

Numerous commenters expressed concern regarding climate change and the Projects' impact on climate change. The U.S. Global Change Research Program's report notes the following observations of environmental impacts that may be attributed to climate change or are projected to occur in the Midwest region with a high or very high level of confidence:

- average temperatures have risen about 1.5ºF between 1900 and 2010 and are projected to increase another 4 to 5ºF over the next several decades;
- an increase in health risks due to projected additional heat stress and poor air quality;
- the agricultural crop growing season has lengthened since 1950 and is projected to continue lengthening due to the earlier occurrence of the late spring freeze, potentially increasing crop production in the short-term;
- increased temperatures stress, wetter springs, and the continued occurrence of springtime cold air outbreaks may reduce crop yields overall in the long-term (particularly corn and soybeans);
- a change in range and/or elevation is projected for many tree species with potential declines in paper birch, quaking aspen, balsam fir, and black spruce; and increases in oaks and pines;
- tree species in flat terrain may have difficulty migrating the long distances needed to reach temperatures suitable for the species, resulting in some potential decline in forests;
- increased insect outbreaks, forest fire, and drought may result in increased tree mortality and the reduction in beneficial carbon sinks;
- annual precipitation has increased by about 20 percent over the past century, particularly from increased high intensity rainfall events, and this trend is projected to continue;
- surface water temperatures in the Great Lakes have increased several degrees between 1968 and 2002, and are projected to increase by about 7 to 12ºF by the end of the century; and
- increased surface water temperatures, increased precipitation, and longer growing seasons are projected to result in an increase in blue-green and toxic algae in the Great Lakes, harming fish and reducing water quality.

GHG emissions are a primary cause of climate change (EPA, 2015h, 2015i). Of the GHGs emitted, CO_2 is the most prevalent, accounting for 82 percent of all U.S. emissions in 2012 (EPA, 2015j). Methane (CH_4) is the second most prevalent, accounting for 9 percent of the total U.S. emissions (EPA, 2015k). Between 1990 and 2012, natural gas and petroleum systems accounted for 29 percent of CH_4 emissions in the United States. Although the amount of CH_4 being emitted into the atmosphere is significantly less than that of CO_2, the comparative impact of CH_4 on climate change over a 100-year period (that is, it's GWP) is more than 20 times greater (EPA, 2015d, 2015l). Fugitive CH_4 emissions are common in natural gas systems and can occur during natural gas production, transmission, storage, and distribution (EPA, 2015m).

The GHG emissions associated with the construction and operation of the Projects are discussed in more detail in section 4.11.1. Emissions of GHGs from the Projects would not have any direct impacts on the environment in the area of the projects. Currently, there is no standard methodology to determine how the proposed Projects' relatively small incremental contribution to GHGs would translate into physical effects of the global environment.

However, the U.S. Global Change Research Program's report states that in the Midwest region "per capita GHG emissions are 22 percent higher than the national average due, in part, to the reliance on fossil fuels, particularly coal for electricity generation." Additionally, burning natural gas results in less CO_2e compared to other fuel sources (e.g., fuel oil or coal). Therefore, the report also notes that increased use of natural gas in the Midwest may reduce emissions of GHGs. We find that the Projects, along with other planned natural gas projects in the Midwest region, may result in the displacement of some fuel oil use or encourage the use of lower carbon fuel for new growth areas, thereby potentially offsetting some regional GHG emissions, in terms of CO_2e.

We received comments that our climate change analysis should include a lifecycle analysis of emissions from natural gas production through combustion for gas that would be transported via the Rover Project. As discussed above, upstream production is outside the scope of this EIS and is considered speculative and not casually connected. As such, lifecycle emissions are not further addressed in this EIS.

Currently proposed and potential future projects, such as the Leach XPress Project, that could connect to the Rover Project could also require the construction and operation of compressor stations. These compressor stations would undergo the relevant federal and state permitting and mitigation process and would be subject to pertinent mitigation requirements. We assume that all existing compressor stations are operating within permit guidelines, and any proposed compressor stations would operate within the same guidelines for their facility. Therefore, anticipated emissions from proposed compressor stations in the region are expected to be similar to that of the Rover Project. In addition, the GHG emissions from the Project would be accounted for as required by the states in which the Project is located. For example, the Pennsylvania Climate Change Act requires PADEP to prepare a report on the potential impacts of climate change every 3 years, inventory GHG emissions annually, and establish a climate change committee to advise PADEP on climate change (PADEP, 2008). The Governor of Illinois ordered the creation of the Illinois Climate Change Advisory Group to propose strategies to reduce GHG emissions to 1990 levels by 2020 (IL, 2006). Examples of the strategies proposed in Illinois include incentives for fuel-efficient vehicles, passenger and freight rail upgrades, energy efficiency standards for appliances and equipment, energy conservation and efficiency programs for existing state facilities, and expansion of no-till farming (ICCAG, 2007). Therefore, we conclude the proposed Projects would not significantly contribute to GHG cumulative impacts.

Noise

The proposed Projects could contribute to cumulative noise impacts. However, the impact of noise is highly localized and attenuates quickly as the distance from the noise source increases; therefore, cumulative impacts are unlikely unless one or more of the projects listed in appendix S are constructed at the same time and location. Based on the schedule and proximity of these activities to the pipeline route, there may be some cumulative noise impacts. However, since the majority of noise impacts associated with the projects would be limited to the period of construction and most construction activities would occur during daytime hours and be intermittent rather than continuous, the proposed contribution from the Projects to cumulative noise impacts would primarily be for only short periods of time when the construction activities are occurring at a given location.

Operation of the Projects' meter stations and/or mainline valves would not result in a perceptible noise increase or exceed our thresholds. Noise from blowdown events, which are typically infrequent, of short duration, and occur during daytime hours, may be perceptible at the NSAs, but not at an excessive level such as to interrupt normal human conversation. The maximum estimated noise at a NSA from the blowdown events would be 49 dBA, which is less than that of a washing machine at approximately 65 to 70 dBA (EPA, 1974). Based on the analyses conducted and mitigation measures proposed, we conclude that the Project's meter stations and mainline valves would not result in significant noise impacts on residents, or the surrounding communities.

Operation of the Projects' compressor stations would result in noise from the engines, gas aftercoolers, utility coolers, fuel gas regulation skids, discharge and suction piping, blowdown vents, engine air intakes, engine exhaust systems, and compressor and engine casings. Based on the analyses conducted and mitigation measures proposed, we conclude that the Projects compressor stations would not result in significant noise impacts on residents, or the surrounding communities during operation as noise levels are expected to be below our 55 dBA L_{dn} requirement, and are not expected to result in a perceptible noise increase at the nearest NSAs. In addition, the operation of Projects is not expected to result in a perceptible increase in vibration at any NSA.

Construction and operation of other FERC-jurisdictional projects would be required to adhere to similar noise requirements and mitigations measures as the Projects.

4.13.6.11 Reliability and Safety

Impacts on reliability and public safety would be mitigated through the use of the DOT Minimum Federal Safety Standards in 49 CFR 192, which are intended to protect the public and to prevent natural gas facility accidents and failures. In addition, Rover's construction contractors would be required to comply with the Occupational Safety and Health Administration Safety and Health Regulations for Construction in 29 CFR 1926. No cumulative impacts on safety and reliability are anticipated to occur as a result of the proposed Projects.

4.13.7 Conclusion

The majority of cumulative impacts would be temporary and minor when considered in combination with past, present, and reasonably foreseeable activities. However, some long-term cumulative impacts would occur on wetland and upland forested vegetation and associated wildlife habitats. In particular, we identified that some short-term cumulative impacts could occur primarily in Monroe County, Ohio where Rover and Columbia would construct two pipelines in the same non-exclusive easement. As discussed throughout this section, adverse cumulative effects related to these two projects may occur on wetlands, water resources, vegetation, and soils, particularly if construction occurs concurrently or immediately preceding one another. We acknowledge that both these pipelines operators have committed to minimize impacts through coordination of construction, but we are unable to assess the specifics of how these commitments would manifest into reduced impacts on the environment. **Therefore we recommend that,**

- **Prior to construction, Rover should file with the Secretary, for the review and written approval of the Director of OEP, a construction coordination plan that identifies the specific construction measures (such as retention of the same contractor, re-use of equipment bridges, coordinated installation of erosion control devices, or restoration commitments) that Rover and Columbia have agreed to implement in the construction of the parallel portions of their respective projects in the non-exclusive easement.**

Short-term cumulative benefits would also be realized through jobs and wages and purchases of goods and materials. There is also the potential that the proposed projects would contribute to a cumulative improvement in regional air quality if a portion of the natural gas associated with the proposed projects displaces the use of other more polluting fossil fuels.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS OF THE ENVIRONMENTAL ANALYSIS

The conclusions and recommendations presented in this section are those of the FERC environmental staff. Our conclusions and recommendations were developed with input from the EPA, COE, FWS, OHEPA, and WVDEP as cooperating agencies. The federal cooperating agencies may adopt the EIS per 40 CFR 1506.3 if, after an independent review of the document, they conclude that their permitting requirements and/or regulatory responsibilities have been satisfied. However, these agencies would present their own conclusions and recommendations in their respective and applicable records of decision. Otherwise, they may elect to conduct their own supplemental environmental analysis, if necessary.

We determined that construction and operation of Rover's, Panhandle's, and Trunkline's Projects would result in some significant and adverse environmental impacts. These impacts would take place during both construction and operation of the Projects and occur on vegetation and wildlife as discussed in section 4 of this EIS. However, if the proposed Projects are constructed and operated in accordance with applicable laws and regulations, the mitigating measures discussed in this EIS, and our recommendations, these impacts would be reduced to acceptable levels. This conclusion is based on a review of the information provided by the applicants and further developed from data requests; field investigations; scoping; literature research; alternatives analyses; and contacts with federal, state, and local agencies as well as individual members of the public. As part of our review, we developed specific mitigation measures that we determined would appropriately and reasonably reduce the environmental impacts resulting from construction and operation of the Projects. We are therefore recommending that our mitigation measures be attached as conditions to any authorization issued by the Commission. A summary of the anticipated impacts, our conclusions, and our recommended mitigation measures is provided below, by resource area.

Geology and Paleontological Resources

The primary effect of construction of the Rover Project on geologic resources would be disturbances to steep topographic features found along the construction right-of-way. All areas disturbed during pipeline construction would be graded and restored as closely as possible to pre-construction contours during cleanup and restoration.

Rover performed geotechnical feasibility studies at all 30 locations where trenchless construction is proposed to evaluate subsurface conditions. The Rover pipeline would be located within 0.25 mile of 893 oil and gas wells and 117 mining operations consisting mainly of coal, sand, gravel, and limestone mines. The closest active well to the Project workspaces is 2.2 feet from the proposed Burgettstown Lateral at MP BGL 4.0. Several additional wells are within 100 feet of the Rover Project. The proposed pipeline right-of-way crosses a total of 105 mines, of which 51 are actively operated. Rover would install warning signs and safety fence along the work area within 100 feet of any well. Welding activities within 100 feet of a well would require hot work permits and a fire watch. Rover would also prefabricate any section of the pipeline that would be installed within 100 feet of a well in order to minimize welding activities that would be required near the well. Rover would establish communication plans and work with mine operators to prevent any hazards to the pipeline. Any restriction on mining operations in the Project area would be determined through an easement agreement between the applicant and the relevant mine operator. The easement agreement would provide guidance on where excavation could occur within an easement, heavy equipment crossing requirements, notices, and blasting requirements. Rover conducted an analysis of the Project route using aerial and ground surveys to determine areas of potential geological hazards and filed the results of those surveys in March 2016. As part of the Geohazard Evaluation Report, Rover's consultants identified additional mitigation measures that would minimize impacts from landslides and subsidence. However, since Rover has not indicated whether it would adhere to these mitigation measures, we are recommending that Rover adopt the measures outlined in its Geohazard Evaluation Report.

Mineral resources within 0.25 mile of the Panhandle and Trunkline Projects vary by region, as these Projects are minor, but have broad spatial geography. These resources would not be impacted because all activities related to these Projects would take place at existing facilities.

Flash flooding is a potential hazard in the Project area. The greatest potential for flash flooding to occur along waterbodies in the area of the Rover Project is associated with high intensity, short-duration storm events. Rover has designed all waterbody crossings to minimize potential impacts from flash flooding, scouring, and high flow velocities on the pipeline. There are several areas along the pipeline route where a karst hazard may be present. Rover conducted an aerial analysis of the Project area and later conducted follow up on the ground surveys to identify karst features or karst prone areas. The field reconnaissance surveys were completed, and additional monitoring by a professional geologist during construction was recommended by Rover's consultant. As Rover has not committed to adhere to adhere to do so, we are recommending that Rover hire a professional geologist to monitor Project construction in those areas identified in its Field Reconnaissance of Karst Prone Areas report. Rover has also developed a general Karst Mitigation Plan to mitigate potential impacts and hazards from karst features (see appendix G). The work to be conducted as part of the Panhandle and Trunkline Projects would be limited to modifications at existing facilities and no waterbody crossings are associated with these Projects. Therefore, the potential for hazards from flash flooding for these Projects is very low.

The pipeline would traverse 172.0 miles of areas identified as having shallow bedrock. However, Rover has stated that it does not anticipate that blasting would be required for construction of the Project. If shallow bedrock is encountered, other methods of bedrock removal such as ripping, chipping, or grinding would be used to remove bedrock. Rover has updated its Blasting Plan to include testing of wells and springs within 150 feet of blasting for yield both pre- and post-construction. The Panhandle and Trunkline Projects do not cross areas with shallow depth to bedrock.

With the implementation of Rover's CMPs (which include its Plan and Procedures), we conclude that impacts on geological resources would be adequately minimized.

We do not anticipate that construction of the Projects would uncover significant paleontological resources, and no known paleontological sites have been identified. However, there is the potential for an unanticipated discovery of fossils along the Rover pipeline route, especially if unanticipated areas of shallow bedrock occurs along the trenchline or where bedrock removal is necessary. To minimize impacts on paleontological resources that may be uncovered during construction, Rover would follow the procedures provided in its Paleontological Discovery Plan and would notify the Pennsylvania Department of Conservation and Natural Resources, the West Virginia Geological and Economic Survey, the Curator at Orton Geological Museum at Ohio State University, or other contacts at Western Michigan University, depending on where the unanticipated discovery is made. Given these measures, we conclude that potential impacts on paleontological resources would be adequately minimized.

Due to the limited work associated with the Panhandle and Trunkline Projects on previously disturbed soils, paleontological resources would not be impacted by these Projects.

Soils

The Projects would traverse a variety of soil types and conditions. Construction activities associated with the Projects, such as clearing, grading, trenching, and backfilling, could adversely affect soil resources by causing erosion, compaction, and introduction of excess rock or fill material to the surface, which could hinder restoration. However, the applicants would implement the mitigation measures contained in their CMPs (Rover) and FERC's Plan (Panhandle and Trunkline) to control erosion, enhance successful revegetation, and minimize any potential adverse impacts on soil resources. Specifically, soil impacts would be mitigated through measures such as topsoil segregation, temporary and permanent erosion controls, and post-construction restoration and revegetation of construction work areas. Mitigation measures for agricultural land are outlined in Rover's state-specific AIMPs for Ohio and Michigan. Additionally, Rover would implement its Spill Procedures during construction and operation to prevent, contain, or clean up any accidental spills of material that may contaminate soils. Panhandle and Trunkline would follow the similar procedures put forth in their respective SPAR Plans.

Permanent impacts on soils would mainly occur at the aboveground facilities where the sites would be graveled and converted to natural gas use. Implementation of Rover's CMPs and Panhandle and Trunkline's implementation of the FERC Plan, as well as other Project-specific plans would adequately avoid, minimize, or mitigate construction impacts on soil resources in the remainder of the area of the Projects. Based on our analysis of the applicants' proposed measures, we conclude that potential impacts on soils would be avoided or effectively minimized or mitigated.

Water Resources

<u>Groundwater</u>

Groundwater resources in the area of the Projects come from Pennsylvanian-age sandstone aquifers, Mississippian-age sandstone and carbonate-rock aquifers, Silurian-Devonian-age carbonate-rock aquifers, and the Mississippi embayment sand and gravel aquifer system. None of the Projects would cross, or come within close proximity of, any designated SSAs, and no state-designated aquifers have been identified in the Projects' area(s). The Rover Project crosses one WHPA in Pennsylvania, one WHPA in West Virginia, eight WHPAs in Ohio, and ten WHPAs in Michigan; the Panhandle and Trunkline Projects do not cross any WHPAs.

One hundred and nineteen public or private water supply wells are within 150 feet of the Rover Project. There are no wells within 150 feet of the Panhandle or Trunkline Projects. Rover has agreed to perform pre- and post-construction monitoring for well yield and water quality for private wells within 150 feet of the proposed construction workspace and within 2,000 feet of proposed HDD locations, and provide an alternative water source or a mutually agreeable solution in the event of construction-related impacts. There were no springs identified within 150 feet of the Project area.

Construction activities are not likely to significantly impact groundwater resources because the majority of construction would involve shallow, temporary, and localized excavation. These potential impacts would be avoided or further minimized by the use of construction techniques and mitigation described in Rover's CMPs and FERC's Procedures. The applicants would prevent or adequately minimize accidental spills and leaks of hazardous materials into groundwater resources during construction and operation by adhering to a Spill Plan (Rover) or SPAR Plans (Panhandle and Trunkline). Given the applicants' proposed measures, we conclude that potential impacts on groundwater resources would be avoided, minimized, or mitigated.

Surface Waters

Rover's pipeline right-of-way would cross 864 waterbodies (365 perennial waterbodies, 312 intermittent waterbodies, 181 ephemeral waterbodies, and 6 lakes/ponds), and 140 drainage features (17 perennial, 32 intermittent, and 91 ephemeral). In addition to the waterbody and drainage crossings that would cross the pipes' trenchline, another 160 waterbody crossings and 43 drainage crossings would be within Rover's construction right-of-way (but would not be crossed by the pipeline). The pipeline would cross eight major waterbodies (greater than 100 feet wide). The Panhandle and Trunkline Projects do not cross any waterbodies or drainage features.

Rover is proposing to use the HDD method to install its pipeline at 45 waterbody crossings and 8 drainages, which are comprised of federally or state-designated sensitive waterbodies (not including those that are considered sensitive solely due to their impairment status) and all major waterbodies. In response to our recommendation in the draft EIS, Rover has stated that it would use a dry crossing method for perennial waterbodies classified as designated fisheries or exceptional habitats and ephemeral and intermittent tributaries to the designated fisheries if there is water flow. The open-cut method would be used to install the pipeline at the remaining waterbodies and drainage features. Due to the impacts that would result in crossing waterbodies using the open-cut method, we are recommending that Rover cross all waterbodies identified as coldwater fisheries or exceptional warmwater habitat using dry-ditch crossing methods, except those already proposed for HDD. Rover's proposed aboveground facility and contractor yard sites encompass one waterbody. Access roads associated with Rover's Project would require construction of four new access roads through waterbodies. Rover would install equipment bridges or bridges with flumes for each of those crossings, as depicted in appendix D. Implementation of the mitigation measures outlined in Rover's Procedures and other Project-specific plans, as well as our recommendation regarding dry-ditch crossings, would aid in the effective avoidance or minimization of impacts on surface water resources.

As discussed previously, 160 waterbodies and 43 drainage features along the pipeline route would be within Rover's construction workspaces, but would not be crossed by the pipeline directly. Rover would adhere to its Procedures to avoid impacts on waterbodies and drainages within the proposed construction rights-of-way, to the extent possible. We have reviewed Rover's proposed mitigation measures and find them acceptable.

Surface Water Uses during Construction

Rover is proposing to use both surface water and municipal water sources for hydrostatic testing. Rover may also use municipal water to create HDD drilling mud or purchase the drilling mud from another contractor. After completion of the HDD, disposal of the recovered drill cuttings and fluids would be recycled or disposed of at an approved disposal facility. All water used for hydrostatic testing for the Panhandle and Trunkline Projects would be obtained from municipal sources and would be transported to the respective Projects' sites by truck. Rover would require a total of 266 million gallons of water for hydrostatic testing and HDD drilling operations, where Panhandle and Trunkline anticipate the need for a maximum of 400,000 and 490,000 gallons, respectively.

The Projects would also require municipal and/or surface water for dust suppression. The applicants would obtain all appropriate permits and authorizations required prior to conducting any dust control activities. Given the length of the pipeline and that weather conditions would play a large role in determining need, the amount of water that Rover would need for dust suppression would be determined at the time of construction. However, because use of certain water sources could result in adverse impacts on federally listed or other sensitive species, we are recommending that Rover submit information on the amount and source of the water prior to construction.

Impacts associated with the withdrawal and discharge of water would be effectively minimized by the implementation of the mitigation measures outlined in Rover's CMPs and FERC's Procedures. In addition, the applicants would obtain appropriate National Pollutant Discharge Elimination System discharge permits prior to conducting hydrostatic testing. Accidental spills during construction and operations would be prevented or adequately minimized through implementation of the applicants' Spill Plan or SPAR Plan.

Based on the avoidance and minimization measures developed by Rover for its CMPs, as well as implementation of FERC's Plan and Procedures by Panhandle and Trunkline, we conclude that the Projects would not have significant impacts on surface water resources.

Wetlands

Construction of the Rover pipeline would impact a total of 160.0 acres of wetlands, including 33.4 acres of forested wetlands, 97.4 acres of herbaceous wetlands, and 29.3 acres of shrub-scrub wetlands. Rover would maintain a 10- and 30-foot-wide corridor in wetlands for areas with single pipeline and dual pipelines, respectively. Rover would also selectively remove trees and shrubs within 15 feet of the pipeline centerline, impacting a total of 71.5 acres through the operational life of the Project. All environmental surveys are complete as of February 2016, except where landowner permission has not been acquired. No wetlands would be impacted by construction or operation of the Panhandle and Trunkline Projects.

Construction and operation-related impacts on wetlands would be mitigated by Rover's implementation of the wetland protection and restoration measures contained in Rover's CMPs, including its Procedures as well as compliance with any additional conditions imposed by the COE Section 404 and the respective states' permits. Rover would conduct annual post-construction monitoring of all wetlands affected by construction to assess the condition of revegetation and the success of restoration until revegetation is successful.

Rover requested alternative measures from FERC's Procedures in several areas where it concluded that site-specific conditions do not allow for a 50-foot setback of extra workspace from wetlands or where a 75-foot-wide right-of-way is insufficient to accommodate wetland construction. Based on our review, we concluded that Rover's justifications for the larger right-of-way were insufficient. Therefore, we are recommending that Rover limit its construction right-of-way width in areas of dual pipeline to 95 feet and to 75 feet for single pipeline in all wetlands.

Rover would also avoid wetland impacts at 18 locations to be crossed by HDD. At these locations, Rover proposed to clear vegetation within a 10-foot-wide corridor between the HDD entry and/or exit location along the centerline for the purposes of accessing water to support drilling operations or for use as a travel lane. However, to further reduce impacts and to limit disturbance to the minimum area needed to construct the HDD crossings, we are recommending that Rover limit vegetation clearing between entry and exit points. Additionally, Rover would be required to develop a compensatory mitigation plan as part of its CWA Section 404 permit.

Based on the avoidance and minimization measures developed by Rover, compensatory mitigation to be developed in coordination with appropriate federal and state agencies, as well as our recommendations, we conclude that impacts on wetland resources would be effectively minimized or mitigated.

Vegetation

Construction of the Projects, including the construction right-of-way, extra workspace, aboveground facilities, contractor yards, and access roads would result in impacts on 9,251.8 acres of vegetated lands. This total includes 3,000.6 acres of upland forest. During operations, Rover would mow and maintain a 50- and 60-foot-wide permanent right-of-way for single pipeline and dual pipelines, respectively, no more than once every 3 years; however, a 10- and 30-foot-wide strip centered on the single pipeline and dual pipeline, respectively, may be mowed more frequently to facilitate routine patrols and emergency access to the pipeline centerline. Operation of the Projects would result in impacts on 3,375.4 acres of vegetated lands, including 1,162.1 acres of upland forest.

Rover would use 172 temporary access roads during construction activities and an additional 53 permanent access roads during construction and operation. The access roads would impact 5.0 acres of upland forest during construction and 1.6 acres of upland forest during operation.

The greatest impact on vegetation would be on forested areas because of the time required for tree regrowth back to pre-construction conditions. Construction in forest lands would remove the tree canopy over the width of the construction right-of-way, which would change the structure and local setting of the forest area. The regrowth of trees outside the permanent right-of-way would take years and possibly decades. Moreover, the forest land on the permanent right-of-way would be permanently impacted by ongoing vegetation maintenance during operations, which would preclude the re-establishment of trees on the right-of-way. Additionally, an estimated 79 miles of the route is considered interior forest habitat, which includes upland and wetland vegetation communities. Construction activities would impact roughly 1,316 acres of interior forest habitat. Although Rover has attempted to route its pipeline adjacent to existing disturbances and outside of forested areas where possible, impacts on forest habitat account for about 32 percent of the total Project impacts. In a teleconference with the FWS, Rover committed to providing mitigation to offset impacts on migratory bird habitat. We are recommending that Rover submit a Migratory Bird Conservation Plan, developed in consultation with the FWS, prior to construction.

Rover also conducted invasive plant surveys and identified multiple invasive species along the proposed Project's right-of-way where access was granted. Rover would minimize the spread of invasive plant species through measures outlined in its state-specific AIMPs and its CMPs. Given the occurrence of invasive species identified, Rover would employ site-specific procedures during the restoration phase of construction to prevent the spread of noxious weeds following installation of the pipeline as outlined in its Invasive Species Plan (see appendix G) Additionally, we have recommended that Rover update its Invasive Species Plan to include mitigation measures to minimize the spread of invasive species during construction..

The impact of the pipeline Project on open lands would be short-term as these areas would revegetate quickly, usually within 1 to 3 years. Moreover, open areas would be less affected by vegetation maintenance on the permanent right-of-way.

Rover has, to the extent possible, adopted measures to avoid and minimize adverse impacts on forested uplands; however, the Project's impacts on forested uplands would result in the permanent conversion of forest to open areas or industrial land from the permanent right-of-way, access roads, and aboveground facilities (1,162.1 acres) and long-term impact on forest in the construction right-of-way (1,838.5 acres). Due to the unavoidable losses associated with the scope and clearing of forested areas, we concluded that the Project would significantly impact forested resources within the Project area. While significant, impacts on forested and non-forested vegetation types would be mitigated to the extent practicable and to acceptable levels through adherence to the measures described in Rover's CMPs and with our further recommendation to develop a mitigation plan for migratory bird habitat impacts (i.e., forested land).

Wildlife and Aquatic Resources

The Projects could have both direct and indirect impacts on wildlife species and their habitats. Direct impacts of construction on wildlife include the displacement of wildlife from the right-of-way or work sites into adjacent areas and the potential mortality of some individuals. The cutting, clearing, and/or removal of existing vegetation within the construction work area could also affect wildlife by reducing the amount of available habitat for nesting, cover, and foraging. Indirect effects of construction could include lower reproductive success by disrupting courting, nesting, or breeding of some species, which could also result in a decrease in prey available for predators of these species. Some of these effects would be temporary, lasting only while construction is occurring; or short-term, lasting no more than a few years until the pre-construction habitat and vegetation type would be reestablished. Other impacts would be longer term such as the re-establishment of forested habitats, which could take decades. Rover has minimized potential impacts on wildlife by collocating the workspaces with other existing rights-of-way (approximately 24 percent of the proposed alignment) and adhering to its Plan and Procedures. Rover has stated that it would work with the appropriate state agencies to develop specific procedures to allow the movement and protection of wildlife through the construction work areas.

A variety of migratory bird species, including BCCs, are associated with the habitats that would be affected by the pipeline. The clearing of vegetation during the nesting season could have direct impacts on individual migratory birds. We are recommending that Rover provide its final Migratory Bird Conservation Plan which should include details of the FWS' required conservation measures and mitigation. Additionally, based on comments received from the FWS, we are recommending that Rover conduct all tree clearing between November 15 and March 31 in West Virginia and between October 1 and March 31 in all other states to avoid impacts on listed bat species. Because this timing window encompasses the clearing window for Migratory Birds (and is further restrictive) this recommendation would also minimize impacts on Migratory Birds.

Given the impact avoidance, minimization, and mitigation measures proposed by the applicants, as well as our recommendations, we conclude that the Projects would not have a significant adverse effect on wildlife overall, although some forested species may experience a higher level of impact due to the long-term loss of forested habitat.

Consultations with state agencies identified that the Rover Project would cross 31 waterbodies classified as fisheries of special concern. Two state-designated Approved Trout Waters (also classified as coldwater fisheries) would be crossed in Pennsylvania. In Ohio, the Rover Project would cross 28 waterbodies designated as fisheries of special concern: 25 coldwater habitat – native fauna streams, and 3 exceptional warmwater habitat streams. As mentioned above, we have recommended that Rover implement dry-ditch waterbody crossing methods on all coldwater fishery and exceptional warmwater habitat waterbodies not already proposed for HDD (which includes those designated as fisheries of special concern) to minimize impacts on fishery resources. None of these waterbodies would be impacted by aboveground facilities. No waterbodies containing fisheries of special concern would be crossed in West Virginia or Michigan. The Panhandle and Trunkline Projects would not cross any waterbodies or drainages.

In-stream pipeline construction across waterbodies could have both direct and indirect effects on aquatic species and their habitats, including increased sedimentation and turbidity, alteration or removal of aquatic habitat cover, stream bank erosion, impingement or entrainment of fish and other biota associated with the use of water pumps, downstream scouring, and the potential for fuel and chemical spills. No in-stream blasting is expected to be required for any of the pipeline crossings; therefore, we do not expect any blasting-related fishery impacts. As a pre-emptive measure, Rover developed a Blasting Plan should it be determined at a later date that in-stream blasting is required. The Blasting Plan does contain measures to minimize potential impacts on aquatic resources from blasting.

Rover would minimize the effects of its Project on aquatic resources at waterbody crossings through the use of HDD technology where practicable; construction timing windows, and through proposed restoration procedures. Rover would also implement measures outlined in its Procedures to minimize impacts on aquatic resources such as restoring stream beds and banks to pre-construction conditions and installing and maintaining erosion control devices. Adherence to Rover's Procedures would increase the potential for regrowth of riparian vegetation.

Currently, Rover proposes to use an HDD to install its pipeline at 45 waterbody crossings, dry-ditch method at 30 crossings, and the open-cut (wet-ditch) method for the remaining 789 crossings. The use of an HDD allows the pipeline to be installed beneath the bed of a waterbody without affecting aquatic resources. Inadvertent releases of drilling fluids could occur within a waterbody and result in impacts on water quality and aquatic organisms. However, the majority of these releases occur onshore near the drill's entry and exit points. Rover would adhere to its HDD Plan to prevent inadvertent releases from occurring, as well as to contain and clean up a release should one occur.

Rover would use 23 waterbodies as sources of water for hydrostatic testing, none of which contain sensitive fisheries or fisheries of special concern. The Panhandle and Trunkline Projects would obtain hydrostatic test water entirely from municipal sources.

Rover would minimize impacts associated with hydrostatic testing by fitting intake lines with screens to minimize the entrainment of fish and maintaining base flows, and controlling downstream flow rates to protect aquatic life. Following the completion of the hydrostatic tests, Rover would discharge the test water through energy-dissipation devices to prevent erosion, stream bed scour, suspension of sediments, flooding, or excessive flows. After testing of the Panhandle and Trunkline Projects, water would be discharged to well-vegetated upland areas at a controlled rate. Discharge of hydrostatic test water would comply with all applicable permits, including the sampling of discharge water to document water quality at the time of discharge.

To reduce the potential for surface water contamination and resulting impacts on aquatic life, Rover would implement measures in its Spill Procedures, and Panhandle and Trunkline would adhere to the measures in their respective SPARs. These documents include BMPs to minimize the potential for accidental releases and measures that would be implemented to contain, clean up, and report any releases, should they occur. Additional measures in Rover's CMPs include conducting routine inspections of construction equipment, tanks, and storage areas to help reduce the potential for spills or leaks; restricting refueling and the handling of hazardous materials to greater than 100 feet from wetland and waterbody resources; and the use of secondary containment around all containers and tanks. With adherence to these measures, we conclude that impacts on aquatic resources from potential spills would be adequately minimized.

Based on our review of potential Project impacts on aquatic resources as described above, we conclude that the Rover Project would result in some temporary impacts on aquatic resources, but that these impacts would be adequately mitigated through adherence to the measures described in Rover's CMPs, agency recommendations regarding the timing of construction activities, and our recommendations regarding sensitive waterbody crossings.

Special Status Species

To comply with Section 7 of the ESA, we consulted directly and indirectly (through the applicants' informal consultation) with the FWS and state resource agencies regarding the presence of federally listed, proposed for listing, or state-listed species in the Projects' area(s). In compliance with Section 7, we are requesting that the FWS consider the EIS, along with various survey reports prepared by Rover, as the BA for the Rover Project.

The Panhandle and Trunkline Projects would be constructed and operated on previously disturbed lands at existing facilities sites or on parcels owned or leased by the applicants. Further, no tree clearing would be required for these Projects; therefore, impacts on special status species are not anticipated.

We have also recommended additional mitigation to protect black bears as well as barn owl habitat. The Indiana bat, northern long-eared bat, and a variety of migratory bird species are associated with the habitats that would be affected by the pipeline. The clearing of vegetation during the bat summer roosting season could have direct impacts on individual bat species. We are recommending that Rover adhere to the FWS' recommended winter clearing window for the protection of bats. Since the recommended FWS bat surveys have not yet been completed and because mitigation levels have not been established, we are recommending that Rover complete surveys and consultation with the FWS for the federally listed bat species prior to the start of construction. Based on these factors, we determined that construction and operation of Rover's Project *may affect, but would not likely adversely* affect the Indiana bat or northern long-eared bat, and would not have a significant impact on migratory birds. If FWS requirements cannot be met by Rover, then additional formal Section 7 Consultation would need to be initiated between FERC and the FWS.

Due to comments received from the FWS, we are recommending that Rover conduct tree clearing and construction activities between October 31 and March 15 in areas identified as potential eastern massasauga rattlesnake habitat. Based on field survey results, Rover's proposed avoidance and minimization measures, our recommendation, and consultation with the FWS, we determined that Rover's Project is not likely to jeopardize the continued existence of the eastern massasauga, which is proposed as a federally listed threatened species, and would not contribute to a trend towards federal listing for the eastern hellbender, which is a federal species of concern. The Rover Project would have *no effect* on the copperbelly water snake, Hine's emerald dragonfly, Mitchells Satyr Butterfly, and several state-listed species of concern.

Rover conducted habitat assessments and aquatic surveys for federal and state-listed fish species in streams that would be crossed by the Projects. Rover's geotechnical investigations did not identify any proposed HDD crossing locations with a high risk of frac-out. In addition, Rover would implement the measures contained in its HDD Contingency Plan in the event of a frac-out to control and clean up releases of drilling mud into waterbodies. This plan would minimize the potential for adverse impacts on aquatic organisms.

In addition to the federally listed and candidate species, several state-listed or special concern species were identified as potentially present in Rover's Project area. These species could be affected by the Project, but we do not expect any significant effects given Rover's proposed measures and our recommendations regarding maintaining neat and orderly worksites to minimize human/wildlife interactions, assessments of barns or similar structures for the presence of barn owls, and continued consultation with state agencies to identify further mitigation or survey requirements. Based on implementation of those measures, we conclude that impacts on state-listed and special-status species would be adequately avoided or minimized.

Land Use, Recreation, Special Interest Areas, and Visual Resources

Construction of the Projects would affect 9,995.6 acres of land. Of this, 8,539.2 acres would be for the pipeline facilities, including the pipeline right-of-way and extra workspaces. Of the remaining areas affected, 740.0 acres would be for the aboveground facilities, 590.7 acres would be for contractor yards, and 125.8 acres would be for access roads. During operation, the permanent pipeline right-of-way, aboveground facilities, and permanent access roads would newly encumber 3,421.9 acres of land. The new pipeline would require a new 50- and 60-foot-wide permanent right-of-way for the single and dual pipelines, respectively. To facilitate pipeline inspection, operation, and maintenance, the entire permanent right-of-way in upland areas, except at HDD crossings, would be maintained in an herbaceous/scrub-shrub vegetated state. This maintained right-of-way would be mowed no more than once every 3 years, but a 10-foot-wide strip centered over the pipeline may be mowed annually to facilitate operational surveys.

About 24 percent of the Project route would be collocated with or adjacent to existing pipeline, roadway, railway, and/or utility rights-of-way. Rover has identified locations where its construction right-of-way would consist of a portion of these existing, cleared permanent rights-of-way, which would generally reduce impacts on land use.

Rover has identified 65 residences within 50 feet of its proposed construction work area, 20 of which would be within the construction work area, and 5 that would be crossed by the centerline. An additional 4 homes are within 10 feet. Rover has developed site-specific construction plans for all residences within 50 feet of construction work areas. Of the 20 residences within the construction workspace (but not crossed by the centerline), Rover has reached landowner agreements with 17 of the landowners. Of the five residences crossed by the centerline, Rover has purchased two and negotiations are ongoing for the remaining three. We are recommending that Rover file landowner concurrence for all residences that would be within 10 feet of the construction work area. Additionally, in section 3.4.3 we are recommending that Rover adopt route variations or workspace modifications for those residences within the construction workspace. With the exception of issues noted above, we have reviewed the site-specific plans and found them acceptable.

Two planned developments were identified within 0.5 mile of the Project areas. The pipeline crosses a parcel in Washtenaw County, Michigan where there is a planned subdivision. The pipeline crosses the parcel along existing rights-of way but would not cross the portion of the parcel that is currently proposed for development. Another development was identified in Livingston County, Michigan. The pipeline follows an existing right-of-way along the edge of the property and it appears the parcel would still be able to be developed; however, we were unable to confirm the proposed site plan on the parcel. Therefore, we are recommending that Rover file the results of consultations with the landowner to document that the pipeline route would not inhibit the proposed development.

In general, impacts on recreational and special interest areas would be temporary and limited to the period of active construction, which typically would last only several days to several weeks in any one area. These impacts would be minimized by implementation of Rover's CMPs. We are also recommending that Rover develop a mitigation plan in consultation with the MIDNR for the crossings of trails in the Pinckney Recreation Area.

The pipeline would cross several tracts of land supporting specialty crops such as Christmas tree farms, as well as a grass-fed cattle farm. After issuance of the draft EIS, we received comments identifying an organic farm within the Project area. As Rover has not identified any mitigation measures for the organic farm, we are recommending that Rover coordinate with the landowner to develop site-specific mitigation measures. Rover is coordinating with landowners to mitigate and compensate for potential impacts on these lands. If additional specialty crops are identified prior to construction, Rover would coordinate with landowners regarding mitigation and compensation. Additionally, Rover has identified a number of parcels enrolled in the CRP program that would be crossed by the Project. Rover is continuing to consult with landowners and the local farm bureaus to identify any further lands enrolled in these program lands.

Almost 5,400 acres of agricultural land would be impacted during construction of the Projects. After issuance of the draft EIS, we received comments from the OHDA regarding the measures outlined in Rover's Ohio AIMP in comparison to the state's pipeline construction standards. Therefore, we are recommending that Rover consult with the OHDA on the Ohio AIMP and file any additional mitigation measures that may result from its discussions with the state. Additionally, we received numerous comments from landowners regarding the impacts the Rover Project would have on agricultural land. The main concerns raised by these landowners are the potential for reduced crop yields and impacts on drainage systems. Rover has developed state-specific AIMPs for Ohio and Michigan to minimize impacts. The plans include methods such as topsoil segregation, decompaction, and the repair and replacement of irrigation and drainage structures. In order to monitor any potential long-term effects on agricultural crop yield or drainage patterns, we are recommending that Rover develop a 5-year post-construction monitoring program to evaluate crop productivity in areas impacted by the construction of the Project. To mitigate impacts on drainage systems and agricultural drain tiles, Rover has hired an agricultural consultant to develop drain tile mitigation plans for parcels where drain tiles may be affected. However, because these plans have either not been finalized or filed with the FERC, we are recommending that Rover file its final Drain Tile Relocation and Reclamation Plans prior to construction. Additionally, we are recommending that Rover commit to hiring local drain tile contractors to install/repair any damaged drain tiles, as well as provide information on encountered, severed, and/or damaged drain tile lines to the landowner and the local county Soil and Water Conservation District.

Visual resources along the pipeline route are a function of geology, climate, and historical processes, and include topographic relief, vegetation, water, wildlife, land use, and human uses and development. A portion of the pipeline rights-of-way (about 24.0 percent) would be installed within or parallel to existing pipeline and/or utility rights-of-way. As a result, the visual resources along collocated portions have been previously affected by other similar activities. Impacts in other areas would be greatest where a conversion from forested land to a grassy, maintained right-of-way would occur, particularly at viewing locations such as roadways.

In general, the impacts on visual resources resulting from the construction and operation of the MLVs would be minimal as each site is small and would be operated within the pipeline operational right-of-way or within an aboveground facility. Construction and operation of compressor stations and meter stations would result in a greater impact on visual resources. Construction of new aboveground facilities would result in the conversion of 107.7 acres of forest, agricultural, and open land into industrial land. Several of the facilities are within the viewshed of residences. Some of these residences would have existing visual buffers that would screen their view of the aboveground facilities, while others would have altered viewsheds. Rover developed a visual screening plan to minimize the impacts of construction of certain aboveground facilities. We are recommending minor changes to these plans to further mitigate the impacts. Overall, visual impacts on residences within close proximity to the aboveground facilities would be permanent.

With adherence to Rover's proposed impact avoidance, minimization, and mitigation plans, and our recommendations, we conclude that overall impacts on land use and visual resources would be adequately minimized.

Socioeconomics

Construction of the Projects would not have a significant adverse impact on local populations, housing, employment, or the provision of community services. There would be short-term increases in traffic levels due to the commuting of the construction workforce to the area of the Projects as well as the movement of construction vehicles and delivery of equipment and materials to the construction right-of-way. To address traffic impacts related to construction across and within roadways and railroads, Rover developed a Residential Access and Traffic Mitigation Plan. Construction of the Panhandle and Trunkline Projects would not require the crossing of any roadways or railroads.

We received comments regarding the potential effect of the pipeline Project on property values, mortgages, and potentially modified landowner insurance policies. After assessing available studies regarding property values and reviewing a previous literature review on the topic conducted by the FERC, we conclude that a loss of property value or inability to obtain a mortgage due to construction of a pipeline is not supported by the literature. FERC staff is not aware of instances where the proximity of an interstate natural gas pipeline has resulted in a change to a residential homeowners' insurance policy. To address this issue, we are recommending that Rover file any documented complaints from homeowners regarding cancelled or voided insurance policies and it should identify how it mitigated the impact. The reports should be included in Rover's status reports during construction and in its quarterly reports for 2 years after construction.

Based on our research and analysis, there is no evidence that the Projects would result in disproportionately high and adverse health or environmental effects on minority or low-income communities.

The long-term socioeconomic effect of the Projects is likely to be beneficial, based on the increase in tax revenues that would accrue in the counties affected by the Projects. Based on the analysis presented, and our recommendations, we conclude that the Projects would not have a significant adverse effect on the socioeconomic conditions of the Project area.

Cultural Resources

Rover conducted archival research and surveys for the proposed Rover Project to identify cultural resources and locations for additional subsurface testing in areas with potential for prehistoric and historic archaeological sites.

In West Virginia, Rover identified 14 archaeological sites within the survey area. Thirteen of the sites were recommended as not eligible for the NRHP, and one was unassessed and would be avoided. Rover identified three historic aboveground resources. Two were cemeteries and were determined to be outside the Project workspace but would not be directly affected. A 100-foot buffer would be placed around each cemetery during Project construction activities. The third resource was recommended as not eligible for the NRHP.

In Pennsylvania, Rover identified three archaeological sites within the survey area and six historic aboveground resources within the Project viewshed. All nine resources were recommended as not eligible for the NRHP.

In Ohio, Rover identified 193 archaeological sites within the survey area. Six of the sites were considered eligible and the remaining 187 were recommended as not eligible for the NRHP. One of the eligible sites would be avoided by HDD, two of the sites are outside the workspace and would be avoided, and three eligible sites were avoided by realignment of the Rover Project corridor. Rover identified 79 historic aboveground resources. Forty-three of the resources were recommended as not eligible for the

NRHP. Thirty-six of the resources were considered eligible; the Rover Project would have no adverse effect on 35 of these. One of the resources is located across the road from Mainline Compressor Station 1. Rover indicated that it would propose screening measures and determined the Rover Project would have no adverse effect on this resource.

In Michigan, Rover identified 69 archaeological sites within the survey area. Ten of the sites were unassessed, and one was considered eligible. Rover would avoid these sites through Project realignment or adjustments to extra workspace. The remaining 58 sites were recommended as not eligible for the NRHP. Rover identified 45 historic aboveground resources. Fourteen of the resources were considered eligible and 31 were considered not eligible. Rover determined that nine of the eligible resources would have no adverse effect. For the remaining five, Rover indicated avoidance plans would be submitted.

No historic properties would be affected by the Panhandle and Trunkline Projects.

Both we and the applicants contacted federally recognized Native American tribes (42 associated with the Rover Project, 10 associated with the Panhandle Project, and 1 associated with the Trunkline Project) to provide them an opportunity to comment on the proposed Projects. Several tribes and organizations requested additional consultation or information. Three tribes responded with no objections to the Rover Project, six tribes responded with no objections to the Panhandle Project, and one tribe responded with no objection to the Trunkline Project.

To ensure that our responsibilities under Section 106 of the NHPA are met, we are recommending that Rover not begin construction until Rover has filed all outstanding SHPO comments on its survey reports, all outstanding cultural resources surveys and SHPO comments, any necessary site-specific plans, and the Director of OEP has notified Rover in writing that construction may proceed. The studies and impact avoidance, minimization, and measures proposed by Rover, and our recommendation, would ensure that any adverse effects on cultural resources would be appropriately mitigated.

Air Quality and Noise

Air Quality

Air quality impacts associated with construction of the Projects would include emissions from fossil-fueled construction equipment and fugitive dust. Such impacts would generally be temporary and localized and are not expected to cause or contribute to a violation of applicable air quality standards. Similarly, emissions associated with the modifications at existing Panhandle and Trunkline facilities would be intermittent and short-term. Once construction activities in an area are completed, fugitive dust and construction equipment emissions would subside and the impact on air quality due to construction would go away completely. Further, construction emissions do not exceed the General Conformity thresholds in areas of degraded air quality. Therefore, we conclude that the Projects' construction-related impacts would not result in a significant impact on local or regional air quality.

The Rover Project would consist of 10 compressor stations, 21 meter stations, 77 mainline valves, 6 tie-ins, and 11 pig launchers/receivers. The majority of new emissions from the Rover Project would result from operation of the 10 new compressor stations.

Emissions generated during operation of the pipeline portion of Rover's Project would be minimal, limited to emissions from maintenance vehicles and equipment and fugitive emissions (considered negligible for the pipeline). The Projects are located in several particulate matter maintenance and nonattainment areas, therefore, we are recommending that Rover revise its Fugitive Dust Control Plan. Rover submitted applications for construction and operation of each compressor station to the WVDEP, PADEP, and OHEPA, as appropriate. The Defiance, Mainline 1, Mainline 2, Mainline 3, and Seneca Compressor Stations would require Title V permits for operation. However, all compressor stations would be minor sources with respect to PSD and NNSR. All compressor engines would use oxidation catalysts for control of formaldehyde, CO, and VOCs. Minimization of other pollutant emissions would be achieved with normal engine maintenance and the use of natural gas fuel. Modeled impacts at Rover's compressor stations were all below applicable standards. As with pipeline operations, any emissions resulting from operation of Rover's compressor stations would not have significant impacts on local or regional air quality.

Increases in emissions during the operating phase of the Panhandle and Trunkline Projects would be minimal and would not have significant impacts on local or regional air quality.

Noise

Construction equipment for the Projects would be operated on an as-needed basis. NSAs near the construction areas may experience an increase in perceptible noise, but the effect would be temporary and local. Noise mitigation measures that would be employed during construction include the use of sound-muffling devices on engines and the installation of barriers between construction activity and NSAs. Additional noise mitigation measures could be implemented to further reduce construction noise disturbances at NSAs. Generally, nighttime noise would not increase during construction with the exception of HDD activity. Rover's proposed mitigation would attempt to reduce noise levels from HDD activity to below 55 dBA L_{dn}. While Rover has identified measures to reduce the noise levels at HDD locations, it has not provided information to demonstrate the effectiveness of these measures. Therefore, we are recommending that Rover revise its HDD noise mitigation plan to include this information. We are recommending that Rover include HDD noise measurements in its construction status reports to verify that noise levels do not exceed significant levels. Based on modeled noise levels, mitigation measures proposed, and the temporary nature of construction, we conclude that the Projects would not result in significant noise impacts on residents and the surrounding communities during construction.

The new compressor stations would generate noise on a continuous basis (i.e., 24 hours a day) once operating. Rover completed an analysis to identify the estimated noise impacts at the nearest NSAs from the facilities and found that noise levels from each compressor station are projected to be below the FERC criterion of 55 dBA L_{dn} and noise level increases would be undetectable at NSAs for all compressor stations, except the Clarington Compressor Station. To ensure that that the actual noise levels produced at the compressor stations are not significant, we are recommending that Rover submit noise surveys once the compressor stations are placed in service and if necessary that Rover add noise mitigation until noise levels are below our acceptable thresholds. Operation of the Rover's meter stations would not result in a perceptible noise increase or exceed the FERC noise criterion**.** Noise from planned or unplanned blowdown events could exceed the noise criteria but would be infrequent and of relative short duration. Noise impacts would result from operation of Rover's pipeline facilities, compressor stations, and meter stations. Based on the analyses conducted, mitigation measures proposed, and our recommended noise surveys, we conclude that operation of Rover's Project would not result in significant noise impacts on residents and the surrounding communities.

Reliability and Safety

The pipeline and aboveground facilities associated with the Projects would be designed, constructed, operated, and maintained to meet the DOT Minimum Federal Safety Standards in 49 CFR 192 and other applicable federal and state regulations. These regulations include specifications for material selection and qualification; minimum design requirements; and protection of the pipeline from internal, external, and atmospheric corrosion. We received comments expressing concern about how the pipeline would be maintained over time and the long-term safety of operations. The DOT rules require regular inspection and maintenance, including repairs as necessary, to ensure the pipeline has adequate strength to transport the natural gas safely.

We received several comments expressing concern about a pipeline sited near residences and also comments expressing concern about the potential effects of a pipeline rupture and natural gas ignition (the area of potential effect is sometimes referred to as the potential impact radius). While a pipeline rupture does not necessarily ignite, the DOT does publish rules that define high consequence areas where a gas pipeline accident could do considerable harm to people and their property and requires an integrity management program to minimize the potential for an accident. Rover would implement its own management plan for its pipeline facilities which would be clearly marked at line-of-sight intervals and at other key points to indicate the presence of the pipeline. The pipeline system would be inspected to observe right-of-way conditions and identify soil erosion that may expose the pipe, dead vegetation that may indicate a leak in the pipeline, conditions of the vegetation cover and erosion control measures, unauthorized encroachment on the right-of-way such as buildings and other structures, and other conditions that could present a safety hazard or require preventive maintenance or repairs. Rover would employ the use of a Supervisory Control and Data Acquisition system that would allow for continuous monitoring and control of the Project.

Several commentors expressed concern about the availability of emergency personnel and materials to respond to an incident on the pipeline. Rover would prepare an emergency response plan that would provide procedures to be followed in the event of an emergency that would meet the requirements of 49 CFR 192.615. The plan would include the procedures for communicating with emergency services departments, prompt responses for each type of emergency, logistics, emergency shut down and pressure reduction, emergency service department notification, and service restoration. The DOT also will require Rover to maintain communication lines with local emergency services and provide continuing education programs. Rover would provide the appropriate training to local emergency service personnel before the pipeline is placed into service.

Trunkline and Panhandle Projects would not require construction of any new facilities. Construction of the upgrades at the existing facilities would be performed in accordance with all applicable requirements of 49 CFR 192.

We conclude that the applicants' implementation of the above measures would help to protect public safety and the integrity of the proposed facilities.

Cumulative Impacts

Three types of projects (past, present, and reasonably foreseeable projects) could potentially contribute to a cumulative impact when considered with the proposed Projects. These projects include Marcellus and Utica Shale development (wells and gathering systems), natural gas facilities that are not under the Commission's jurisdiction, other FERC-jurisdictional natural gas pipelines, and unrelated actions such as electric generation and transmission projects, transportation projects, and residential or commercial development projects. The region of influence for cumulative impacts varies depending on the resource being discussed. Specifically, we included:

- minor projects, including residential development, small commercial development, and small transportation projects within 0.5 mile of the proposed Project area;
- major projects, including large commercial, industrial, transportation and energy development projects, requiring more than 10 acres of land, within 10 miles of the proposed Project area;
- major projects within watersheds crossed by the proposed Projects; and

- projects with potential to result in longer-term impacts on air quality (for example, natural gas pipeline compressor stations) located within an AQCR crossed by the proposed Projects.

We received comments associated with development of natural gas reserves in the Marcellus and Utica Shales. Production and gathering activities are overseen by the affected region's state and local agencies with jurisdiction over the management and extraction of the Marcellus and Utica Shale gas resources. Development of these shale resources is expected to continue in proximity to and during construction and operation of portions of the pipeline Projects in West Virginia, Pennsylvania, and Ohio. Although we do not examine the impacts of Marcellus and Utica Shale upstream facilities to the same extent as the Projects in this EIS, we considered the general development of the Marcellus and Utica Shale in proximity to the Projects within the context of cumulative impacts.

Our cumulative impacts assessment also considers cumulative impacts related to 10 planned, proposed, or existing FERC-jurisdictional natural gas transmission projects that have portions within 10 miles of the proposed Projects. Of these projects, the Nexus, MVP, and Leach XPress would be the closest to the Rover Project. All of the FERC-jurisdictional projects would be constructed and maintained in accordance with our approved procedures and other construction, operation, and mitigation measures that may be required by federal, state, or local permitting authorities, further reducing the potential for cumulative impacts.

Impacts associated with the proposed Projects in combination with other projects such as residential developments, electric generation, and transportation projects, would be relatively minor overall. It is anticipated that any adverse impacts on sensitive resources resulting from each of the other projects considered in our analysis would be regulated through project design, BMPs, and agency permitting. Therefore, we conclude that the cumulative impacts associated with the Projects, when combined with other known or reasonably foreseeable projects, would be effectively limited.

Alternatives

As an alternative to the proposed action, we evaluated the no-action alternative, system alternatives, route alternatives, and aboveground facility site alternatives. While the no-action alternative would eliminate the short- and long-term environmental impacts identified in the EIS, the stated objectives of the applicants' proposals would not be met.

Our analysis of system alternatives included an evaluation of whether existing or proposed natural gas pipeline systems could meet the Projects' objectives while offering an environmental advantage. Rover has incorporated one substantial system alternative into the Rover Project. Rover had initially planned to construct the Market Segment from the Defiance Compressor Station in Defiance, Ohio, to the Union Gas Dawn Hub in Ontario, Canada. Rover and Vector reached an agreement during the FERC's pre-filing process to shorten the Rover Project and provide an interconnection near Market Segment MP 100.0. With Vector's Mainline Expansion Project in place, incorporation of this system alternative eliminated 110 miles of pipeline from the original proposal and provides the required capacity to move contracted product to the Union Gas Dawn Hub. For the remaining portion of the Rover Project, there is no available and suitably located capacity for existing pipeline systems to transport the required volumes of natural gas, nor are they connected to the Rover Project's gas supply area in the Marcellus and Utica Shale regions of West Virginia, Pennsylvania, and Ohio. No existing pipeline system with the capacity to transport the contracted load connects the Marcellus and Utica Shale regions to serve the Project markets. Therefore, we do not consider use of existing pipeline systems as feasible alternatives for the proposed Projects.

We evaluated major route alternatives for those Project segments where we either received comments from the public or where we identified potential environmental advantages of the alternative route. This included an evaluation of the Berne Supply Lateral, Sherwood Supply Lateral, Mainlines A and B, and the Market Segment alternatives. We identified a section of the Market Segment where the alternative would result in fewer impacts by following an existing right-of-way. Therefore, we are recommending that Rover adopt the 3-mile-long Market Segment Alternative Section 2. None of the remaining major route alternatives would offer major environmental advantages over the proposed pipeline route; therefore, we are not recommending them.

Rover assessed numerous minor route variations over the course of Project development and indicated that as of March 2016, Rover had adopted a total of 127 variations into its proposed route for various reasons including landowner requests, avoidance of sensitive resources, or engineering considerations. Rover assessed stakeholder requested variations received prior to the draft EIS. Of these, Rover identified 26 that were unable to be adopted for reasons such as engineering limitations, increased number of landowners impacted, and increased environmental impacts. However, based on our evaluation, we identified three of these variations where landowner concerns could be addressed through route adjustments. Additionally, there were 10 parcels where Rover identified route adjustments that were pending additional surveys. In the draft EIS, we recommended that Rover file either its final route adjustments for parcels where landowner issues were yet unresolved or adopt a route adjustment developed by FERC staff. Rover filed updates on each of the 13 parcels. Rover has reached easement agreements with three of the landowners and concerns for four of the landowners were addressed through reroutes or adjustments to the workspace. Rover assessed the remaining six parcels and indicated reroutes were not feasible. Based on our assessment of the remaining six parcels, we agreed with Rover's conclusion.

Prior to the draft EIS, Rover identified 3 residences that were within 10 feet of (but not crossed by) the construction workspace and an additional 10 residences that are within the construction workspace. Based on updated information filed by Rover, all but three of the residences have been either purchased or the route has been relocated further from the residence. Rover indicated that it was still in negotiations with the remaining three landowners. Additionally, due to reroutes along the Project filed after the draft EIS, additional residences are now crossed by the Project or within 10 feet of the workspace. Rover has indicated that it has been unable to reach an agreement on four of those parcels. Since Rover has not yet purchased those properties crossed or provided landowner concurrence for the residences within 10 feet, we are requesting that Rover file written documentation of an agreement between the landowner and Rover or adopt a variation or workspace modification for each residence.

Following issuance of the draft EIS, 29 stakeholders provided comments about specific impacts on their properties, stated that prior issues at their parcels remained unresolved, or also requested that the FERC evaluate minor route variations that might avoid resources on their parcels. Rover agreed to accept two of the proposed variations, but did not adopt the other 27 requests. Based on our review of the requests, we found that in addition to the variation Rover agreed to, there were eight more requests that were feasible. We recommended that Rover adopt these route variations or additional mitigation measures.

We evaluated alternative sites for two compressor stations: the Burgettstown Compressor Station and the Mainline Compressor Station 2. After submittal of its application, Rover proposed new sites for the Burgettstown Compressor Station and Mainline Compressor Station 2. Based on our evaluation, the alternative sites for the Mainline Compressor Station 2 were not considered to offer a significant environmental advantage. Based on our evaluation of the Burgettstown Compressor Station location, we determined that the Alternative Site 1 (Rover's originally proposed location) did offer an environmental advantage over the proposed site and recommended in the draft EIS that Rover adopt the alternative. However, after issuance of the draft EIS, Rover provided additional information on the alternative location and stated that the Alternative Site 1 location was not available for purchase. Given that the landowner was unwilling to sell the parcel on which Alternative Site 1 is located, and that the proposed site is considered environmentally acceptable (i.e., we did not identify any significant issues with the location that required avoidance of the site altogether) we are no longer recommending adoption of the alternative.

5.2 FERC STAFF'S RECOMMENDED MITIGATION

If the Commission authorizes the Rover, Panhandle, and Trunkline Projects, we recommend that the following measures be included as specific conditions in the Commission's Order. We conclude that these measures would further mitigate the environmental impact associated with construction and operation of the proposed Projects.

1. The applicants shall each follow the construction procedures and mitigation measures described in its application and supplements, including responses to staff data requests and as identified in the EIS, unless modified by the Order. The applicants must:
   a. request any modification to these procedures, measures, or conditions in a filing with the Secretary of the Commission (Secretary);
   b. justify each modification relative to site-specific conditions;
   c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
   d. receive approval in writing from the Director of OEP **before using that modification**.

2. The Director of OEP has delegated authority to take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the Projects. This authority shall allow:
   a. the modification of conditions of the Order; and
   b. the design and implementation of any additional measures deemed necessary (including stop-work authority) to ensure continued compliance with the intent of the environmental conditions as well as the avoidance or mitigation of adverse environmental impact resulting from construction and operation of the Projects.

3. **Prior to any construction**, the applicants shall each file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EIs' authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.

4. The authorized facility locations shall be as shown in the EIS, as supplemented by filed alignment sheets. **As soon as they are available, and before the start of construction**, the applicants shall file any revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

   Rover's exercise of eminent domain authority granted under NGA Section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. Rover's right of eminent domain granted under NGA Section 7(h) does not authorize it to increase the size of its natural gas pipeline to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. The applicants shall file detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, contractor yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, and documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP **before construction in or near that area**.

   This requirement does not apply to extra workspace allowed by the applicants' Plans and/or minor field realignments per landowner needs and requirements which do not affect other landowners or sensitive environmental areas such as wetlands.

   Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

   a. implementation of cultural resources mitigation measures;
   b. implementation of endangered, threatened, or special concern species mitigation measures;
   c. recommendations by state regulatory authorities; and
   d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.

6. **Within 60 days of the acceptance of the Certificate and before construction begins**, the applicants shall file their respective Implementation Plans for review and written approval by the Director of OEP. The applicants must file revisions to their plans as schedules change. The plans shall identify:

   a. how the applicants will implement the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests), identified in the EIS, and required by the Order;
   b. how the applicants will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;
   c. the number of EIs assigned, and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;
   d. company personnel, including EIs and contractors, who will receive copies of the appropriate material;
   e. the location and dates of the environmental compliance training and instructions the applicants will give to all personnel involved with construction and restoration (initial and refresher training as the Projects progress and personnel change) with the opportunity for OEP staff to participate in the training sessions;
   f. the company personnel (if known) and specific portion of the applicant's organization having responsibility for compliance;

g. the procedures (including use of contract penalties) the applicants will follow if noncompliance occurs; and

h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:

   i. the completion of all required surveys and reports;
   ii. the environmental compliance training of onsite personnel;
   iii. the start of construction; and
   iv. the start and completion of restoration.

7. **Rover** shall employ at least one EI per construction spread. **Trunkline and Panhandle** shall employ at least one EI per Project. The EIs shall be:

   a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;

   b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;

   c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;

   d. a full-time position, separate from all other activity inspectors;

   e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and

   f. responsible for maintaining status reports.

8. Beginning with the filing of its Implementation Plan, Rover shall file updated status reports with the Secretary on a **weekly basis until all construction and restoration activities are complete**. Panhandle and Trunkline shall file updated status reports with the Secretary on a **monthly basis until construction and restoration activities are complete**. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:

   a. an update on the applicant's efforts to obtain the necessary federal authorizations;

   b. the construction status of the their respective Project facilities, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally sensitive areas;

   c. a listing of all problems encountered and each instance of noncompliance observed by the EIs during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);

   d. a description of corrective actions implemented in response to all instances of noncompliance, and their cost;

   e. the effectiveness of all corrective actions implemented;

   f. a description of any landowner/resident complaints that may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and

g. copies of any correspondence received by the applicants from other federal, state, or local permitting agencies concerning instances of noncompliance, and the applicant's response.

9. Prior to receiving written authorization from the Director of OEP to commence construction of their respective Project facilities, the applicants shall file documentation that they have received all applicable authorizations required under federal law (or evidence of waiver thereof).

10. The applicants must receive written authorization from the Director of OEP **before placing their respective Projects into service**. Such authorization will only be granted following a determination that rehabilitation and restoration of areas affected by the Projects are proceeding satisfactorily.

11. **Within 30 days of placing the authorized facilities in service**, each applicant shall file an affirmative statement with the Secretary, certified by a senior company official:

    a. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or

    b. identifying which of the Certificate conditions the applicant has complied or will comply with. This statement shall also identify any areas affected by their respective Projects where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

12. **As part of its Implementation Plan**, Rover shall confirm the location of the Seneca Lateral within its non-exclusive easement and identify any locations where the lateral would deviate from the non-exclusive easement in accordance with recommendation 5. *(section 2.2.1.2)*

13. Rover shall adopt the 3-mile-long Market Segment Alternative Section 2 to collocate the proposed pipeline with the ITC corridor. *(section 3.4.1.3)*

14. Rover shall adopt the two route variations at MPs BGL 48.9 and MAB 44.0 (as specified in table 3.4.3-1 and depicted in appendix I2 of the EIS) and file with the Secretary revised alignment sheets for the Burgettstown Lateral and Mainlines A and B that incorporate these variations into the Rover Project **prior to the start of construction**. *(section 3.4.3)*

15. Rover shall adopt the route variations and/or alternative construction techniques for MPs SHL 34.4, MJL 7.2, and BGL 37.1 (as specified in table 3.4.3-2 and depicted in the corresponding figure in appendix I2 of the EIS) and adopt workspace modifications for MPs SEL 10.0, MS 73.45, CLL 8.0, and SEL 22.7, or file with the Secretary written documentation that Rover and the landowner have reached an alternative agreement. Additionally, Rover shall file with the Secretary revised alignment sheets for the Sherwood Lateral, Majorsville Lateral, Burgettstown Lateral, Seneca Lateral, Market Segment, and Clarington Lateral that incorporate these variations into the Rover Project **prior to the start of construction**. *(section 3.4.3)*

16. Rover shall adopt the minor route variations for MPs SWL 35.3, SEL 19.0, SEL 24.0, CLL 27.9, MJL 13.5, MAB 44.0, and MS 65.0 (as specified in table 3.4.3-3 and depicted in appendix I2 of the EIS) and adopt the additional mitigation measures for MP BGL 1.0 (see table 3.4.3-3). Rover shall file with the Secretary updated alignment sheets incorporating these minor route variations **prior to the start of construction**. *(section 3.4.3)*

17. Rover shall hire a professional geologist to monitor construction of the Project in the five areas that were identified in the January 2016 Field Reconnaissance of Karst Prone Areas Report. *(section 4.1.3.6)*

18. **Prior to construction,** Rover shall file with the Secretary clarification that it has adopted the mitigation measures outlined in its October 2015 Geohazard Evaluation Report.

19. **Prior to construction**, Rover shall file information identifying the type of all wells located within 150 feet of the Project area without an identified well type and documentation of consultation with appropriate resource agencies for all public water supplies. *(section 4.3.1.5)*

20. Rover shall provide affected landowners with copies of applicable pre- and post-construction evaluation reports for all wells within 150 feet of the proposed construction work area (and within 2,000 feet of HDD locations in areas of karst terrain). Post-construction evaluations should be performed **as soon as practicable** following the completion of construction in the area of applicable well(s). *(section 4.3.1.7)*

21. **Prior to construction**, Rover shall confirm that it will use dry-ditch crossing methods for all waterbodies designated as coldwater fisheries or exceptional warmwater habitat except those already proposed as an HDD crossing. *(section 4.3.2.5)*

22. **Prior to construction,** Rover shall file with the Secretary, for the review and written approval by the Director of OEP, a revised Fugitive Dust Control Plan that identifies the following:

    a. the name and approximate intake location (if applicable) of each water source that will be used to obtain water for dust suppression activities;

    b. how Rover will determine that dust abatement is necessary;

    c. the specific maximum speed limit for construction equipment and procedure for posting and enforcing this speed limit;

    d. the site and/or construction activity conditions requiring the installation of gravel pads;

    e. the track-out control devices that construction traffic will cross;

    f. the maintenance procedures that Rover will use for construction equipment to reduce dust; and

    g. how and under what circumstances Rover will cover open-bodied haul trucks, as appropriate. *(sections 4.3.2.5 and 4.11.1.3)*

23. **During construction of the Project**, Rover shall not clear any trees between the workspaces for HDD entry and exit sites. Rover may conduct minor brush clearing, less than 3 feet wide, using hand tools only, to facilitate the use of the HDD tracking system or acquisition of water for the makeup of the HDD slurry. **During operation**, Rover shall not conduct any routine vegetation maintenance along the HDD segments. *(section 4.4.3)*

24. **Prior to construction,** Rover shall adopt the alternative route at MP CLL 27.8 as identified in table 3.4.3-3 and as depicted in appendix I2 of the EIS or provide documentation from the OHEPA and the COE describing how Rover's proposed route would not conflict with or result in a violation of any terms and conditions of the Clean Water Act permits issued to the CONSOL Mining Company. *(section 4.4.3)*

25. **Prior to construction,** Rover shall file revised alignment sheets that limit its construction right-of-way width in areas of dual pipeline to 95 feet and in areas of single pipeline to 75 feet in all wetlands. *(section 4.4.4)*

26. **Prior to construction**, Rover shall revise the Invasive Species Plan, in consultation with the appropriate federal, state, and local agencies, to include mitigation measures that would be taken during construction to prevent the spread of invasive species. Mitigation may include, but is not limited to: training of workers in the recognition of invasive species and to be familiar with locations where invasive species were identified during surveys, cleaning of equipment prior to entering the right-of-way, or setting up wash stations to remove invasive species from vehicles, equipment, and materials in areas identified as having an invasive species present. Rover shall

file the revised plan with the Secretary, for review and written approval of the Director of OEP. *(section 4.5.4)*

27. **Prior to construction**, Rover shall file with the Secretary, for review and written approval of the Director of OEP, its final Migratory Bird Conservation Plan that includes documentation of its consultation with the FWS regarding avoidance, minimization, and mitigation measures. *(section 4.6.1.5)*

28. **During construction of the Project**, Rover shall adhere to the FWS tree clearing window and shall restrict tree clearing activities to **between October 1 and March 31** in Michigan, Ohio, and Pennsylvania and **between November 15 and March 31** in West Virginia. *(section 4.7.2)*

29. Rover shall not begin construction of the Rover Pipeline Project **until**:

    a. all outstanding bat surveys have been completed;

    b. species conservation plans and mitigation have been approved by FWS or state regulatory authority;

    c. the FERC staff completes any necessary ESA Section 7 consultation with the FWS; and

    d. Rover has received written notification from the Director of OEP that construction and/or use of mitigation (including implementation of conservation measures) may begin. *(section 4.7.2)*

30. **During construction of the Project**, Rover shall restrict construction activities (including tree clearing) to **between October 31 and March 15** in areas identified as potential eastern massasauga rattlesnake habitat. *(section 4.7.2)*

31. **Prior to construction**, Rover shall confirm that it will incorporate into its construction plans requirements that worksites be maintained in a neat and orderly manner, with all personal trash items disposed of properly; and that construction debris be removed from all work areas in a timely manner, and disposed of in a state-approved off site location by the end of each work day. *(section 4.7.3)*

32. **Prior to removing barns or other structures that represent potential barn owl habitat**, Rover shall evaluate and assess each barn or similar structure for the presence of barn owls. Rover shall file with the Secretary the results of the surveys and identify any additional mitigation measures developed in consultation with the OHDNR, for review and written approval of the Director of OEP. (*section 4.7.3)*

33. **Prior to construction**, Rover shall continue to consult with applicable state agencies to identify any additional mitigation measures for state-protected species and the need for additional surveys for Ohio, Michigan, West Virginia, and Pennsylvania. The results of such consultations and any outstanding surveys shall be filed with the Secretary. *(section 4.7.3)*

34. **Prior to construction**, Rover shall file with the Secretary, for the review and written approval of the Director of OEP, evidence of landowner concurrence with the site-specific residential construction plans for all locations where construction work areas would be within 10 feet of a residence (including residences within the construction workspace). *(section 4.8.3.1)*

35. **Prior to construction**, Rover shall file with the Secretary documentation of its consultations with the landowner of parcel MI-LI-021.500, including evidence that clarifies how the pipeline will impact the planned development of the parcel as approved by Putnam Township. *(section 4.8.3.2)*

36. **Prior to construction**, Rover shall file with the Secretary a 5-year post-construction monitoring program to evaluate crop productivity in areas impacted by the construction of the Project. Rover

shall include in the program a commitment to file with the Secretary quarterly reports for a period of 5 years following construction documenting any crop-related problems, including soil heating near compressor stations identified by the company or landowner, and describing any corrective action taken to remedy those problems. The program shall stipulate that if any landowner agrees that revegetation and crop productivity are successful prior to the 5-year requirement, Rover shall provide documentation in its quarterly reports, indicating which landowners have agreed that monitoring is no longer necessary. This documentation shall include the landowner name, tract number, and the date of agreement. *(section 4.8.4.1)*

37. **Prior to construction**, Rover shall consult with the OHDA on construction procedures to be used in agricultural land in Ohio, and Rover shall file with the Secretary any updates to the Ohio AIMP that result from coordination with the OHDA. Any comments received from OHDA on Rover's Ohio AIMP shall also be filed with the Secretary. *(section 4.8.4.1)*

38. **Prior to construction in agricultural lands**, Rover shall file with the Secretary its final Drain Tile Relocation and Reclamation Plans including landowner concurrence with the plans. *(section 4.8.4.1)*

39. **Prior to construction,** Rover shall commit to hire local drain tile contractors to install/repair drain tiles that are damaged or need to be rerouted due to construction activities. *(section 4.8.4.1)*

40. **Upon completion of construction,** Rover shall provide information on encountered, severed, and/or damaged drain tile lines to the landowner, the local county Soil and Water Conservation District, and the information shall be kept in the company's landowner records for future reference. *(section 4.8.4.1)*

41. **Prior to construction**, Rover shall file with the Secretary, for review and written approval of the Director of OEP, an impact avoidance, minimization, or mitigation plan for the organic farm at MP MAB 57.8. Rover shall include documentation that the plan was developed in consultation with the landowner. *(section 4.8.5.1)*

42. **Prior to construction**, Rover shall file with the Secretary, for review and written approval of the Director of OEP, a complete list of all CRP enrolled lands that would be crossed by the Project by milepost. In addition, Rover shall file with the Secretary any revised impact mitigation measures or conservation plans that will be necessary in order to maintain CRP compliance along with confirmation from the FSA that parcels will remain eligible for the program if the specified mitigation is implemented. If parcels will no longer be eligible for enrollment, Rover shall identify how it will compensate landowners for the lost program benefits. *(section 4.8.5.2)*

43. **Prior to construction**, Rover shall file with the Secretary, for review and written approval of the Director of OEP, an impact avoidance, minimization, or mitigation plan for the trails located in the Pinckney Recreation Area. Rover shall include documentation that the plan was developed in consultation with the MIDNR. *(section 4.8.5.3)*

44. **Prior to construction of Mainline Compressor Stations 1 and 3**, Rover shall file with the Secretary revised visual screening plans for these compressor stations that incorporate a second row of Colorado blue spruce and adopt a spacing of 20 feet or less between the trees in each row. *(section 4.8.7.2)*

45. Rover shall file with the Secretary reports describing any documented complaints from affected landowners that a homeowner's insurance policy was either cancelled or voided due directly to the grant of the pipeline right-of-way or installation of the pipeline and/or that the premium for the homeowner's insurance increased materially and directly as a result of the grant of the pipeline right-of-way or installation of the pipeline. The reports shall also identify how Rover has mitigated the impact. These reports shall be included in Rover's weekly construction status

reports and in its quarterly reports **for a 2-year period following in-service of the Project**. *(section 4.9.6)*

46. Rover shall not begin implementation of any treatment plans/measures (including archaeological data recovery); construction of facilities; or use of staging, storage, or temporary work areas and new or to-be-improved access roads **until**:

   a. Rover files with the Secretary:

      i. the Ohio SHPOs' comments on Ohio archaeological and architectural survey reports;

      ii. the Michigan SHPO's comments on the Michigan final report, addendum 1 and 2 reports, and avoidance plan for 11 sites;

      iii. the West Virginia SHPO's comments on the revised West Virginia survey report;

      iv. the Pennsylvania SHPO's comments on the additional architectural information requested in its April 13, 2015 letter;

      v. all outstanding cultural resources survey/testing reports and any required evaluation reports, and the SHPOs' comments on the reports;

      vi. any necessary treatment plans or site-specific protection plans, and the appropriate SHPO's comments on the plans;

   b. the ACHP is provided an opportunity to comment if historic properties would be adversely affected; and

   c. the FERC staff reviews and the Director of OEP approves all cultural resources survey reports and plans, and notifies Rover in writing that treatment plans/mitigation measures may be implemented or construction may proceed. (*section 4.10.4*)

   All material filed with the Secretary containing **location, character, and ownership information** about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: **"CONTAINS PRIVILEGED INFORMATION - DO NOT RELEASE."** *(section 4.10.4)*

47. Rover shall file in the **weekly construction status reports** the following for each HDD entry and exit site:

   a. the noise measurements from the nearest NSA for each drill entry/exit site, obtained at the start of drilling operations;

   b. the noise mitigation that Rover implemented at the start of drilling operations; and

   c. any additional mitigation measures that Rover would implement if the initial noise measurements exceeded an L_{dn} of 55 dBA at the nearest NSA and/or increased noise is over ambient conditions greater than 10 decibels. (*section 4.11.2.2*)

48. Rover shall file a noise survey with the Secretary **no later than 60 days** after placing each of the Rover Project compressor stations in service. If a full load condition noise survey of the entire station is not possible, Rover shall instead file an interim survey at the maximum possible horsepower load and file the full load survey **within 6 months**. If the noise attributable to the operation of all of the equipment at any compressor station under interim or full horsepower load conditions exceeds 55 dBA L_{dn} at any nearby NSAs, Rover shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. Rover shall confirm compliance with the 55 dBA L_{dn} requirement by filing a second

noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls. (*section 4.11.2.3*)

49. **Prior to construction**, Rover shall file with the Secretary, for the review and written approval of the Director of OEP, a construction coordination plan that identifies the specific construction measures (such as retention of the same contractor, re-use of equipment bridges, coordinated installation of erosion control devices, or restoration commitments) that Rover and Columbia have agreed to implement in the construction of the parallel portions of their respective projects in the non-exclusive easement. *(section 4.13.7)*

FEDERAL ENERGY REGULATORY COMMISSION
Routing Code PJ 11.4
Washington, DC 20426