ROVER PIPELINE
An ENERGY TRANSFER Company

ROVER PIPELINE LLC

Rover Pipeline Project

RESOURCE REPORT 11
Reliability and Safety

FERC Docket No. CP15-___-000

February 2015

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LIST OF ACRONYMS

ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
FBE	fusion bonded epoxy
FERC	Federal Energy Regulatory Commission
HCA	high consequence area
hp	Horsepower
ICS	Incident Command Struction
MAOP	maximum allowable operating pressure
MLV	mainline valve
Part 191	Title 49 CFR Part 191
Part 192	Title 49 CFR Part 192
PHMSA	Pipeline and Hazardous Materials Safety Administration
Project	Rover Pipeline Project
psig	pounds per square inch gauge
Rover	Rover Pipeline LLC
SCADA	Supervisory Control and Data Acquisition
U.S.	United States
USDOT	U.S. Department of Transportation

RESOURCE REPORT 11—RELIABILITY AND SAFETY	
Filing Requirement	**Location in Environmental Report**
• Describe measures proposed to protect the public from failure of the proposed facilities (including coordination with local agencies). (§ 380.12 (*m*)(1))	Sections 11.1 and 11.3
• Discuss hazards, the environmental impact, and service interruptions which could reasonably ensue from failure of the proposed facilities. (§ 380.12 (*m*)(2))	Section 11.1
• Discuss design and operational measures to avoid or reduce risk. (§ 380.12 (*m*)(3))	Sections 11.1 and 11.2
• Discuss contingency plans for maintaining service or reducing downtime. (§ 380.12 (*m*)(4))	Sections 11.2 and 11.3
• Describe measures used to exclude the public from hazardous areas. Discuss measures used to minimize problems arising from malfunctions and accidents (with estimates of probability of occurrence) and identify standard procedures for protecting services and public safety during maintenance and breakdowns. (§ 380.12 (*m*)(5))	Section 11.3

11.0 RELIABILITY AND SAFETY

Rover Pipeline LLC (Rover) is seeking authorization from the Federal Energy Regulatory Commission (FERC) pursuant to Section 7(c) of the Natural Gas Act to construct, own, and operate the proposed Rover Pipeline Project (Project). The Rover Pipeline Project is a new natural gas pipeline system that will consist of approximately 711.2 miles of Supply Laterals and Mainlines, 10 compressor stations, and associated meter stations and other aboveground facilities that will be located in parts of West Virginia, Pennsylvania, Ohio, and Michigan. The Project will include approximately 509.1 miles of proposed right-of-way, extending from the vicinity of New Milton, Doddridge County, West Virginia to the vicinity of Howell, Livingston County, Michigan and will include approximately 202.1 miles of dual pipelines.

The Project will consist of the following components and facilities:

- Supply Laterals:
  - eight supply laterals consisting of approximately 199.7 miles of 24-, 30-, 36-, and 42-inch-diameter pipeline in West Virginia, Pennsylvania, and Ohio,
  - two parallel supply laterals, each consisting of approximately 18.8 miles (for a total of approximately 37.6 miles) of 42-inch-diameter pipeline (Supply Connector Lateral Line A and Line B) in Ohio,
  - approximately 72,645 horsepower (hp) at six new compressor stations to be located in Doddridge and Marshall counties, West Virginia; Washington County, Pennsylvania; and Noble, Monroe, and Harrison counties, Ohio, and
  - two new delivery, 11 new receipt, and two bidirectional meter stations on the Supply Laterals.

- Mainlines A and B:
  - approximately 190.6 miles of 42-inch-diameter pipeline (Mainline A) in Ohio,
  - approximately 183.3 miles of parallel 42-inch-diameter pipeline (Mainline B) in Ohio,
  - approximately 114,945 hp at three new compressor stations to be located in Carroll, Wayne, and Crawford counties, Ohio, and
  - two new delivery meter stations in Defiance County, Ohio.

- Market Segment:
  - approximately 100.0 miles of 42-inch diameter pipeline in Ohio and Michigan,
  - approximately 25,830 hp at one new compressor station to be located in Defiance County, Ohio, and
  - two new delivery meter stations in Washtenaw and Livingston counties, Michigan.

Resource Report 11 addresses the potential hazard to the public from failure of Project components resulting from accidents, natural catastrophes, or acts of third parties. In addition, this Resource Report addresses what procedures and design features would be used to avoid undue hazards or effects, and what measures, including equipment, training, emergency response, and emergency notification procedures,

would be implemented to protect the public from failure of the Project due to accidents or natural catastrophes. More details concerning the design, construction, and operation of the Project can be found in Resource Report 1.

During Rover's participation in the FERC Pre-Filing Review Process, many commenters were concerned about safety, which is addressed in this report. Another concern was the potential for stray voltage from the pipeline to affect dairy cattle. Stray voltage is a natural phenomenon that can be found at very low levels between two contact points where electricity is grounded. Utility electric distribution systems and farm electric systems are grounded to the earth to ensure safety and reliability. Inevitably some current flows through the earth at each point where the electric systems are grounded creating a small (stray) voltage.

Any stray voltage resulting from overhead electric transmission lines near or adjacent to the pipeline corridor have the potential to negatively impact the pipeline from a corrosion standpoint. Although the pipeline does not create these stray voltages, it is imperative that the pipeline identify them and mitigate them appropriately. A licensed third party will be employed to conduct a system-wide alternating current mitigation study to identify all locations where there is a potential for this issue, and to develop mitigation techniques along the route designed to address stray voltage.

11.1 NATURAL GAS PIPELINE INDUSTRY STANDARDS

This section provides a brief overview of the potential hazards, safety and regulatory standards, industry standards, pipeline accident data, and impacts on public safety associated with natural gas pipelines.

11.1.1 Hazards

The transportation of natural gas by pipeline involves some degree of risk in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a pipeline rupture. Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is nontoxic and classified as a simple asphyxiate. However, high concentrations of methane in breathing air can create an oxygen deficiency, resulting in serious injury or death.

Methane has an autoignition temperature of over 1,100 degrees Fahrenheit and is flammable at concentrations between 5 percent and 15 percent in air. Unconfined mixtures of methane in air are not explosive. However, a flammable concentration within an enclosed space in the presence of an ignition source can explode. Methane is lighter than air, having a specific gravity of 0.55. Therefore, methane released at atmospheric temperatures will rise and rapidly disperse.

A pipeline accident, or natural catastrophe affecting a pipeline, can result in the following:

- gas release only,
- ignition with fire,
- ignition with explosion,

- exposure of the operator, the public, the natural habitat and populated species, or
- operational impacts with service deficiencies or interruptions,

As described in the following sections, Rover will design, construct and operate the Project in accordance with all applicable federal regulations, including implementation of emergency response and contingency plans, and proactive measures designed to eliminate or minimize the potential occurrence of such incidents. These measures will include, but are not be limited to, those outlined in the following sections.

11.1.2 Pipeline Safety Standards

The U.S. Department of Transportation (USDOT), Pipeline and Hazardous Materials Safety Administration (PHMSA) is the federal agency with authority for regulating oil and gas pipelines. According to PHMSA, there are 2.6 million miles of pipelines across the U.S., and those pipelines provide the safest and most cost-efficient means to transport hazardous materials. Over the past two decades, the risk of pipeline incidents with death or major injury have decreased by approximately 10 percent every three years (PHMSA, 2013). As described in the following sections, there are multiple layers of safeguards that must be built into the design, construction and operation of the Project pipelines by implementing the requirements of federal law. Because the risk of incidents with death or major injury has declined steadily over the past two decades, the probability of incidents for a new pipeline system such as the Rover Pipeline Project is greatly reduced.

The USDOT is exclusively authorized to promulgate safety and design standards for pipelines and transportation facilities under the Pipeline Safety Act, as amended (49 U.S. Code §§ 60101 *et seq*.). The USDOT Minimum Federal Safety Standards are set forth in Title 49 of the Code of Federal Regulations (CFR) Part 192 (Part 192). Part 192 specifies material selection and qualification, minimum design and construction requirements, protection from internal, external, and atmospheric corrosion, as well as operational requirements (see Section 11.3).

11.1.2.1 Class Locations

Part 192 defines four area classifications based on population density in the vicinity of the pipeline. The classification area extends for 220 yards (660 feet) on either side of the centerline of any continuous 1-mile length of pipeline. The four area classes as defined by federal law are as follows:

- Class 1: Location with 10 or fewer buildings intended for human occupancy.
- Class 2: Location with more than 10 but fewer than 46 buildings intended for human occupancy.
- Class 3: Location with 46 or more buildings intended for human occupancy or where pipeline lies within 100 yards of any building, or small, well-defined outside area occupied by 20 or more people on at least five days a week for 10 weeks in any 12 month period.
- Class 4: Location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require more stringent considerations in pipeline design, wall thickness, testing, and operation. For example, pipelines constructed 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 depth of cover of 36 inches in normal soil and 24 inches in consolidated rock (49 CFR § 192.327). Class locations also specify the following maximum distances to a sectionalizing mainline valve (MLV): 10 miles in Class 1, 7.5 miles in Class 2, 4 miles in Class 3, and 2.5 miles in Class 4 (49 CFR § 192.179). Pipeline design pressures, wall thickness, hydrostatic test pressures, maximum allowable operating pressure (MAOP), inspection and testing of welds and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas.

To assess the appropriate class locations for the Project, Rover reviewed aerial imagery, property tax records, and civil surveys to identify the location of residences and other buildings intended for human occupancy, and to determine the density of those buildings along the proposed route. In addition, Rover contacted all counties crossed by the Project to identify any proposed developments. If the population density, proposed developments, or a combination thereof neared the threshold limits for a class location as defined by 49 CFR § 192.5, Rover increased the class location to augment the safety factor of the pipeline and minimize the probability of future disturbance to landowners should an increase in pipe wall thickness be required if the proposed development or additional population density should occur. USDOT class locations for the Rover pipelines are provided in Table 11A-1 in Appendix 11A. Of the Project's approximately 509.1 miles of overall pipeline right-of-way, approximately 374.5 miles (74 percent) are located in Class 1 areas, 128.2 miles (25 percent) in Class 2 areas, and 6.5 miles (1 percent) in Class 3 areas.

Rover will continually monitor the population density along the route using the Continuing Pipeline Surveillance Plan described in Section 11.2.4. If there is an increase in population density after installation of the pipeline and that increase results in a change in class location for a segment of pipeline, 49 CFR §§ 192.609 and 192.611 require that the pipeline operator confirm or revise the MAOP commensurate with the current class location. If physical revisions are required, Rover will accomplish these revisions by reducing operating pressure, or by replacing the segment with pipe of sufficient grade and wall thickness to comply with the USDOT code requirements for the new class location.

11.1.2.2 High Consequence Areas

The PHMSA has promulgated a rule for pipeline integrity management in High Consequence Areas (HCA) for gas transmission pipelines that has been incorporated into Part 192 Subpart O. This rule requires that a facility-specific Integrity Management Plan be developed to document procedures under which pipeline integrity will be monitored and maintained for those areas where a pipeline traverses lands or facilities that are considered HCAs, as defined in 49 CFR § 192.903. An HCA is defined as an area established by one of the methods described below:

- an area defined as Class 3 or Class 4;
- any area in a Class 1 or Class 2 location where the potential impact radius is greater than 660 feet and the area within a potential impact radius contains 20 or more buildings intended for human occupancy; or
- an identified site such as:

    - An outside area or open structure that is occupied by 20 or more persons for at least 50 days in any 12-month period;
    - A building that is occupied by 20 or more persons for at least five days a week for 10 weeks in a 12-month period; or
    - A facility occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

The potential impact radius means the radius of a circle within which the hypothetical failure of a pipeline could have significant impact on people or property. The potential impact radius is determined by the formula r = 0.69 x (square root of ($p \times d^2$)), where 'r' is the radius of a circular area in feet surrounding the point of hypothetical failure, 'p' is the MAOP in the pipeline segment in pounds per square inch gauge (psig), and 'd' is the nominal diameter of the pipeline in inches. For example, a segment of the pipeline with a MAOP of 1,440 psig, a 42-inch-diameter pipeline would have a potential impact radius of 1,100 feet under current PHMSA modeling protocols.

Rover will perform a comprehensive analysis to identify HCAs through review of aerial photography, field surveys, consultation with emergency response officials, and database searches. This analysis will be updated each year or as frequently as needed to meet the requirements of Part 192.

Rover's integrity management program, which will evolve as information and experience are gained on the system, will be updated regularly in an effort to make continual improvements to the program. The initial program will include the following elements:

- identification of all HCAs,
- establishment of a baseline assessment plan,
- identification of threats to each pipeline segment and development of preventive and mitigative measures,
- establishment of an assessment plan depending on the threat assessed,
- establishment of a process for continual evaluation and assessment,
- establishment of a performance plan as outlined in American Society of Mechanical Engineers (ASME)/American National Standards Institute (ANSI) B31.8S, Section 9 that includes performance measures to meet CFR requirements,
- establishment of a communication plan as outlined in ASME/ANSI B31.8S, Section 10,
- establishment of a management of change plan as outlined in ASME/ANSI B31.8S, Section 11,
- establishment of a quality assurance process as outlined in ASME/ANSI B31.8S, Section 12,

- establishment of procedures for providing (when requested) copies of integrity management or risk analysis to state or local pipeline safety authorities,
- establishment of procedures for ensuring that each integrity assessment is being conducted in a manner that minimizes environmental and safety risks, and
- establishment of procedures for identification and assessment of newly-identified HCAs.

HCAs currently located along the Project pipelines total approximately 46.5 miles and are provided in Table 11A-2 in Appendix 11A.

11.1.3 National Pipeline Incident Data

Beginning in June 1984, the USDOT has required all operators of transmission and gathering systems to notify USDOT of any reportable incident and to submit a written report within 30 days of occurrence of the incident (49 CFR Part 191). A reportable incident is one that involves property damage valued at more than $50,000, injury, death, unintentional loss of 3,000,000 cubic feet or more of gas, or any other incident that is considered significant by the operator. Table 11.1-1 summarizes reported onshore natural gas transmission incidents and accidents by category from 1994 to 2013.

TABLE 11.1-1
Incident Summary for Onshore Natural Gas Transmission Pipelines by Cause 1994-2013

Reported Cause of Incident	Number of Incidents [a]	Fatalities	Injuries
Corrosion	260	13	6
Excavation Damage	347	15	42
Incorrect Operation	45	0	9
Material/Weld/Equipment Failure	436	8	71
Natural Force Damage	136	0	2
Other Outside Force Damage	97	0	13
All Other Causes	218	3	45
Total	**1,539**	**39**	**188**

[a] Includes all reported incidents.
Source: U.S. Department of Transportation. Accessed January 2015 online at:
http://primis.phmsa.dot.gov/comm/reports/safety/PSI.html

The most frequent cause of onshore gas transmission incidents is outside force incidents (approximately 38 percent) resulting from excavation damage (i.e., encroachment of mechanical equipment such as bulldozers, and backhoes), natural force damage (i.e., earth movements due to soil settlement, washouts, or geologic hazards, and weather effects such as winds, storms, and thermal strains), and other outside forces. As shown in Table 11.1-2, human error associated with third party excavation damage was responsible for 18.6 percent of all onshore incidents from 1994 to 2013. Since April 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.

TABLE 11.1-2
Outside Force Incidents for Onshore Natural Gas Transmission Pipelines by Cause 1994 - 2013

Cause	Percentage
Third Party Excavation Damage	18.6
Earth Movement	3.0
Heavy Rains/Floods	2.2
Other Outside Forces	0.5

Source: U.S. Department of Transportation. Pipeline and Hazardous Materials Safety Administration. Accessed January 2015 online at: http://primis.phmsa.dot.gov/comm/reports/safety/PSI.html

To reduce the risk of outside force incidents, Rover will:

- install approximately 23 percent of its pipelines parallel to and abutting rights-of-way of other pipelines or utilities, creating a well-marked corridor for excavators to see;
- install all required line markers and signs with appropriate 24-hour contact numbers for identification of the pipeline and facilities;
- ensure through its Operator Qualification Plan (see Section 11.2.3) that its employees are sufficiently trained to eliminate excavation damage caused by operator employees;
- prepare and implement a Public Awareness Plan (see Section 11.3.5), and specifically ensure that property owners along the pipeline are aware of its location on their property;
- adhere to a Continuing Pipeline Surveillance Plan (see Section 11.2.4);
- implement a Damage Prevention Program (see Section 11.2.5);
- participate fully in state One Call systems; and
- review and update operational plans at routine intervals, and especially when new facilities are added.

The next most frequent cause of gas transmission incidents is material failure (approximately 28 percent) and is largely dependent on material, weld, and/or equipment failure or malfunctioning equipment. To reduce the risk of these types of failures, Rover will:

- specify and order its pipe, fittings, valves and other components in strict accordance with company specifications, applicable codes and regulations referenced in Part 192, such as American Petroleum Institute (API) and ASTM standards and specifications;
- employ an inspection and quality control process ensuring the above are manufactured in accordance with the applicable specifications;
- utilize a material tracking system to verify that the specific pipe, valves, or fittings are installed in the correct locations as specified in the plans;
- utilize state of the art welding processes to produce superior pipeline girth welds;
- conduct radiography or non-destructive testing on 100 percent of all pipeline girth welds;

- conduct hydrostatic or other testing on pipeline components after installation that meets or exceeds the requirements of Part 192; and
- run a second generation caliper pig post construction to verify no dents or buckles are present after construction and prior to line commissioning.

Corrosion is the third highest cause of gas transmission incidents (approximately 17 percent) and is largely dependent on internal corrosion. While pipelines installed since 1950 exhibit a fairly constant frequency of corrosion incidents, pipelines installed before that time have a significantly higher rate because corrosion is a time-dependent process. Also, prior to 1971, pipelines were not required to use cathodic protection or protective coatings. The corrosion potential over time for pipelines installed since 1971 is further reduced by the use of more advanced pipe coatings and cathodic protection that significantly reduces the rate of material failure compared to unprotected or partially protected pipe.

To reduce the risk of corrosion failure, Rover will:

- internally coat its pipeline with fusion bonded epoxy (FBE) coating for protection from internal corrosion;
- externally coat its pipeline with FBE coating for protection from external corrosion;
- inspect the pipeline during the lowering-in process with an electronic holiday detector and repair any coating defects with approved repair methods and procedures;
- design, install, and maintain a cathodic protection system to provide continual protection to the pipeline from external corrosion;
- evaluate the potential effects of nearby electric power transmission lines and include appropriate mitigation systems if required;
- utilize a special abrasion resistant overlay coating on all road bores and horizontal directional drill locations so that the pipeline coating is not damaged during pull in;
- develop and implement an Integrity Management Plan with required baseline investigations and periodic reassessments as required;
- clean and coat its aboveground piping and facilities in accordance with the latest company specifications; and
- on periodic intervals, re-evaluate its corrosion system and its effectiveness, making revisions as required, for the life of the pipeline.

11.1.4 Impact on Public Safety

Table 11.1-3 lists the annual fatalities and injuries which occurred on natural gas transmission lines from 1994 through 2013.

TABLE 11.1-3
Natural Gas Transmission Systems Fatalities and Injuries - 1994 – 2013

Year	Fatalities	Injuries
1994	0	22
1995	2	7
1996	1	5
1997	1	5
1998	1	11
1999	2	8
2000	15	16
2001	2	5
2002	1	4
2003	1	8
2004	0	2
2005	0	5
2006	3	3
2007	2	7
2008	0	5
2009	0	11
2010	10	61
2011	0	1
2012	0	7
2013	0	2
Total	**41**	**195**

Source: U.S. Department of Transportation. Pipeline and Hazardous Materials Safety Administration. Accessed January 2015 online at: http://primis.phmsa.dot.gov/comm/reports/safety/SerPSI.html?nocache=7105#_ngtrans

Table 11.1-4 lists nationwide totals for transportation-related fatalities and injuries in 2012, broken down by mode of transportation. While this table provides a relative measure of the industry-wide safety of natural gas transmission pipelines, a direct comparison between modes of transportation categories should be made cautiously since individuals are not uniformly exposed to hazards from all of the modes. Nevertheless, the average number of fatalities resulting from natural gas transmission pipelines is proportionally small considering the number of miles of onshore and offshore transmission lines in service nationwide.

TABLE 11.1-4
Transportation Fatalities and Injuries in the US by Mode in 2012

Mode	Fatalities	Injuries
Highway	33,561	2,362,000
Railroad	557	7,622
Waterborne	714	3,688
Air	447	276
Transit	80	Data Unavailable
Pipeline (All)	12	58
Gas Transmission Pipelines[1]	0	7

Source: U.S. Department of Transportation Bureau of Transportation Statistic, Research and Innovation Technology Administration. Pipeline data updated with preliminary 2012 statistics. Accessed January 2015 online at: http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/index.htm

[1] As provided in Table 11.1-3.

11.2 PROJECT SAFETY STANDARDS

The Project facilities will be constructed and operated in accordance with all applicable USDOT and PHMSA regulations pertaining to pipeline safety. Rover will meet or exceed these requirements and will reinforce compliance with these regulations through implementation of a comprehensive set of company specifications and corporate practices as described in the following sections. These are in addition to the industry standards described above in Section 11.1.

11.2.1 Risk Management and Loss Protection

Rover's approach to risk management and loss prevention is to efficiently identify and control or eliminate hazards throughout the life of a project. It is a continuous process to help identify and manage potential risks to workers, the general public, and customers. Rover is committed to conducting business in a manner that protects the safety and health of the public, employees, its customers, and others involved in its operations.

11.2.2 Operations and Maintenance Plan

Rover will prepare a written Operations and Maintenance Plan that will conform to the requirements of 49 CFR § 192.605. This written plan will include complete details for conducting and documenting all operations and maintenance activities on the pipeline, compressor stations, and metering facilities. The plan will specifically include procedures for handling start up, shut down, repair, and abnormal operations. The plan will outline Rover's corrosion control activities for external, internal, and atmospheric corrosion prevention. The plan will contain provisions to ensure all required reporting is accomplished accurately and on time, and outline documentation requirements for all of the above-listed activities and will be reviewed and updated on an annual basis. The plan will be available at the

compressor stations and the area operations center for applicable personnel, and Rover will ensure that all operations personnel are trained on its contents and requirements.

11.2.3 Operator Qualification Plan

Rover will prepare and implement a written Operator Qualification Plan that will conform to the requirements of Part 192 subpart N. This written plan will include identification of covered tasks that are performed on the pipeline or facilities for operations and maintenance to satisfy the requirements of Part 192 that affect the operation or integrity of the pipeline or facilities. The plan will ensure that Rover provides the necessary training to individuals and that the individuals performing covered tasks are qualified to perform that task. The plan will contain provisions for periodically re-evaluating or updating the skills of individuals if, for example, a significant amount of time has elapsed since the last time the employee performed a specific task. Rover will maintain documentation identifying individuals and the covered tasks they are qualified to perform, the dates of the current qualification, and the method of qualification. Through implementation of this plan, Rover will ensure that only qualified individuals are assigned to perform or direct covered tasks.

11.2.4 Continuing Pipeline Surveillance Plan

Rover will follow its Continuing Pipeline Surveillance Plan, which conforms to the requirements of 49 CFR § 192.613. The plan will include: procedures for conducting routine and continuing surveillance along the pipeline to detect the addition or removal of structures intended for human occupancy, which may affect class locations, as well as procedures to implement appropriate actions based on these changes, procedures to follow when activities are detected on or near the right-of-way that may jeopardize the integrity of the pipeline facilities, and appropriate actions to be taken concerning substantial changes in cathodic protection or other unusual operating and maintenance conditions.

11.2.5 Damage Prevention Program

Rover will prepare and implement a written Damage Prevention Program that meets the requirements of 49 CFR § 192.614. This program will be designed to prevent damage to the pipeline and facilities caused by excavation activities. The program will include: full participation in the West Virginia, Pennsylvania, Ohio, and Michigan One Call Systems, a current listing of persons and companies who normally engage in excavation activities in the areas of the Project facilities, requirements for ongoing contact with the public and potential excavators in the vicinity of the Project facilities for the purpose of making them aware of this Damage Prevention Program, a means of receiving and recording notifications of proposed excavation activities, a procedure for locating and marking the pipeline in the area of the excavation, and a procedure for inspection during any nearby excavation to verify the integrity of the pipeline. The program will include requirements for documentation of the above described activities.

11.3 MEASURES TO PROTECT THE PUBLIC

As a new pipeline, and with the continuing advancements in materials and pipeline operating and maintenance practices, the chances of a failure of the Project pipelines are extremely low. The safety and reliability of the Project pipelines will be based on safe design, appropriate equipment selection, code compliance, thorough review, careful construction, post construction testing, and competent maintenance and operation. Measures will be incorporated according to approved design practices and standards that have been developed through industry-wide experience of pipeline construction projects.

Measures to protect the public from inadvertent natural gas releases due to accidents or natural catastrophes can be grouped into three categories: passive protection, active controls, and procedural controls. These measures are described below.

11.3.1 Passive Protection

Passive protection minimizes the hazards by incorporating process and equipment design features which will reduce either the frequency or consequence of a hazard without the active functioning of a device. The inherent design of modern pipeline systems affords protection for all but the most severe natural hazard events or inadvertent human actions, such as excavation damage by backhoe. Modern pipelines are made of ductile steel with full penetration welds, resulting in a system with substantial, inherent strength and ductility. Passive protection will include:

- Pipeline design, construction, commissioning, and operation will be conducted in strict accordance with applicable USDOT regulations found in Part 192.
- In accordance with USDOT regulations, the pipeline design factor, wall thickness, location of mainline valves, and other parameters will be established according to a classification system based on the number, proximity to the pipeline, and occupation levels of buildings intended for human occupancy located along the right-of-way.
- Rover will comply with the applicable sections of the ASME/ANSI B31.8, Gas Transmission and Distribution Piping Systems, which is the most widely used industry code, for the design, operation, maintenance, and repair of its natural gas transmission pipeline.
- The pipeline will be internally and externally coated with FBE to protect against corrosion.
- Construction specifications will be developed for installation of the proposed facilities incorporating relevant sections of FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* and Rover's *Waterbody and Wetland Construction and Mitigation Procedures*.
- Temporary erosion controls will be utilized to minimize erosion during construction.
- Upon completion of construction, permanent erosion control measures will be installed, and maintained throughout operations.

11.3.2 Active Controls

Active (or engineering) controls use instruments, valves, safety interlocks, and emergency shutdown systems to detect and correct process deviations. Active controls will include the following:

- Applicable overpressure protection systems will be installed at receipt/delivery interconnect points.
- Gas chromatographs will be installed at receipt points to ensure gas quality specifications per producer precedent agreements,
- An impressed current cathodic protection system will be installed as a corrosion prevention measure to protect the integrity of the pipeline system.
- A Supervisory Control and Data Acquisition (SCADA) system will provide for and enable continuous pipeline monitoring and the control of the gas pipeline.
- Remote Terminal Units for the SCADA system will be located on every receipt/delivery interconnect manifold, at those points on the pipeline.
- MLVs will be installed at regular intervals as specified by Part 192 for classification locations.
- MLVs will be equipped with remote-controlled actuators that will allow for valve closure if a rapid loss of pressure is detected.
- All of the field girth welds will be tested via radiography or ultrasonic inspection (non-destructive examination).
- The pipeline and associated facilities will be hydrostatically tested for structural integrity before commencing operation.
- A caliper pig will be run to detect any unacceptable dents or out-of-roundness before commencing operation.
- The pipeline will be equipped with facilities to accommodate smart pigging operations for the purpose of locating anomalies in the pipeline wall thickness that may indicate corrosion, and out-of-roundness that may indicate the pipe has been subjected to external forces.

Odorants are utilized by local distribution systems to facilitate the detection of leaks along typically low-pressure pipeline systems. Transmission systems can often not utilize odorants because the industrial facilities that receive the high pressure gas cannot tolerate the odorant in their processes. Such is the case with intended recipients along the Rover Pipeline, and odorants will not be an option for the Project.

11.3.3 Procedural Controls

Procedural (or administrative) controls use operating procedures, administrative checks, emergency response, and other management approaches to prevent incidents, or to minimize the effects of an accident (e.g., operating procedures, safe work practices, inspections and testing, and training). Rover will prepare an Operating and Maintenance Procedures Manual which will, at a minimum, address the following procedural controls:

- Procedures will be developed for testing, start-up, operation, and training of operations and maintenance staff on operational procedures.
- Regularly scheduled preventative maintenance programs will be developed to meet government regulations for pipeline segments and metering stations.
- An Emergency Response Plan (see Section 11.3.4), will be developed with local fire departments and other agencies, to respond to hazardous conditions caused by the pipeline. Rover will

establish and maintain liaison with the appropriate fire, police, and public officials to coordinate mutual assistance during emergencies.

- Procedures for aerial surveillance flights, on-ground leak detection surveys, internal pipeline inspection with pigging equipment, and cathodic protection system inspection and maintenance will be developed.

Rover will also prepare a Public Awareness Plan (see Section 11.3.5) to enable customers, the public, government officials, and those engaged in excavation to recognize a natural gas pipeline emergency and report it to appropriate public officials and the company.

11.3.4 Emergency Response Plan

Under 49 CFR § 192.615, each pipeline operator must also establish an emergency plan that provides written procedures to minimize the hazards from a gas pipeline emergency. Rover will prepare an Emergency Response Plan that will conform to the requirements of 49 CFR § 192.615. Key elements of the Emergency Response Plan will include procedures for:

- receiving, identifying, and classifying notices of events which require immediate response by the operator;
- establishing and maintaining communications with appropriate fire, police, and public officials;
- prompt and effective response to a notice of each type of emergency, including gas detected inside or near a building, fire located near or directly involving a pipeline facility, explosion occurring near or directly involving a pipeline facility, or natural disaster;
- making personnel, equipment, tools, and materials available at the scene of an emergency;
- protecting people first and then property, and making safe any actual or potential hazards to life or property;
- emergency shutdown and pressure reduction in any section of the system necessary to minimize hazards to life or property;
- notifying appropriate fire, police, and other public officials of gas pipeline emergencies, and coordinating with them both planned responses and actual responses during an emergency; and
- safely restoring any service outage.

The Emergency Response Plan will contain both generic sections applicable to emergency or abnormal conditions across the system and location specific information such as local contact information. Rover will ensure that all operations personnel are trained on its contents and requirements. Additionally, if any events occur that require the implementation of the Emergency Response Plan, immediately thereafter Rover will review the response action taken under the Emergency Response Plan and evaluate its effectiveness using this information to revise the Emergency Response Plan if such revision is necessary.

Rover will implement an emergency response plan during construction, and continuing into operation, to address procedures and guidelines to respond effectively to emergency conditions or incidents that occur at or near Rover's facilities or construction work areas and to reduce the burden on local emergency

responders. There are three response levels based on the nature and potential severity of impact of an incident. The incident level will determine the level of Incident Command Structure (ICS) staffing and resources required.

Rover will identify an Incident Commander who will be responsible for determining the incident classification level, which will establish the response and notification level. The Incident Commander has the responsibility for classifying an incident, making the appropriate notifications, including activating the Emergency Management Team. In certain circumstances, the Incident Commander may or may not activate the Emergency Response call list based upon the severity of the event and the need for additional support. If the call list is not activated, the Incident Commander is still responsible to notify and inform the Emergency Management Team of the incident, the disposition of the event and the resolution to conclude the event and any remedial actions that were or need to be taken.

In responding to emergencies, the ICS organizational structure will be based on specific circumstances and risk associated with the incident. Incidents will be classified as follows:

1) Minor Incident (Level I)
   - Minor fires that are controllable on-site and do not require emergency response;
   - Any incident that is classified as a "near miss";
   - Any incident that does not result in a report to any regulatory agency (e.g. FERC problem area);
   - Any incident with an injury that requires only "first aid treatment"; or
   - Any incident that results in Company or Construction Contractor property damage of less than $50,000.

2) Significant Incidents (Level II)
   - Fires that are controllable by on-site project personnel, flashes, or explosions regardless of location (not requiring response by a Fire Department);
   - Incidents with an injury that is "OSHA Recordable". This level of incident may or may not require the notification of the Emergency Management Team, depending on the type and severity of the recordable incident. The Incident Commander should consult with Rover safety personnel prior to classifying the Incident and making the notifications;
   - Incident that is reportable to any state or federal regulatory agency (such as a fire, spill, or air pollutant release) (e.g. FERC non-compliance report);
   - Incident resulting in significant property damage (>$50,000); or
   - Any other incident where Counsel and/or the appropriate Vice President over the project determines that an investigation is warranted.

Major Incident (Level III)
   - Incident resulting in death or injuries requiring hospitalization of three or more people;
   - Incident involving a significant fire or explosion (involving response by Fire Department, Law Enforcement, or other Emergency Responder);

- Incident involving a member of the public or impacting public or private property outside the limits of the construction right-of-way (other than Rover property or within the limits of the Rover construction work area);
- Incident resulting in media coverage; or
- Any other incident as determined by Counsel and/or the appropriate VP.

For all incidents, the immediate objectives and priorities will be the same. The first priority will be to make sure the area is safe for additional actions and the public. The next priorities will be to notify local authorities as necessary, take steps to control any discharges or releases, and isolate and secure the site. Rover maintains contracts with emergency response contractors, spill response contractors, and other construction and gas and oilfield services that can be of use during emergencies. Likewise the Contractors are required to identify spill response contractors in the region surrounding the Project. Working in coordination with the Construction Contractor, emergency responders, and agency personnel, Rover will utilize these contractors, as necessary, to respond quickly and prudently to control the emergency and mitigate the impacts.

The initial or emergency response is deemed to be over when there is no longer a safety threat, the environmental hazards are controlled or eliminated, the emergency responders "stand-down," the controlled access area is eliminated or reduced in size to about the original work area, and all involved entities (Rover, construction contractor, emergency responders, and agency personnel) agree that the emergency phase of the incident is over.

Once the emergency phase of the response is over, Rover is prepared to manage its part of the repair and mitigation for as long as necessary to return the area to pre-incident conditions. These sustained actions can include repair, clean-up, and remediation. The incident is declared over when the construction project activities return to the pre-incident status, repairs are complete, clean-up is complete, and surface remediation is complete, and/or the pipeline or facility is returned to operation. Certain follow-up actions may be required after the incident response is completed. These can include such things as negotiation and settlement with impacted parties, long-term environmental monitoring, and long-term environmental mitigation and remediation.

11.3.5 Public Awareness Plan

Rover will prepare and implement a written Public Awareness Plan that will conform to the requirements of 49 CFR § 192.616. This written plan will be designed to educate the landowners, the public, government officials, and persons engaged in excavation activities in areas of the pipeline or facilities. This written plan will include:

- efforts to educate the above named parties on the characteristics of natural gas,
- an explanation of the One Call process and how it should be utilized by those planning excavation activities in the vicinity of the pipeline,
- possible hazards associated with the unintended release of gas,
- steps that should be taken immediately for individual safety concerns, and

- procedures for reporting these incidents to Rover.

A common method utilized in the implementation of the Public Awareness Plan is the distribution of calendars or other similar items, with the above information contained therein.

11.4 References

PHMSA, 2013. Written Statement of Cynthia L. Quarterman, Administrator PHMSA, Before the Committee on Commerce, Science, and Transportation United States Senate. Field Hearing—Charleston, WV. *Pipeline Safety: An On-the-Ground Look at Safeguarding the Public*. January 28, 2013.