APPENDIX G-6

Karst Mitigation Plan

ROVER PIPELINE
An ENERGY TRANSFER Company

ROVER PIPELINE LLC

Rover Pipeline Project

Karst Mitigation Plan

February 2015

1.0 INTRODUCTION

The Rover Pipeline Project (Project) is a new natural gas pipeline system that will be constructed by Rover Pipeline LLC (Rover) and will consist of Supply Lateral and Mainline pipelines, compressor stations, and associated meter stations and other aboveground facilities that will be located in parts of West Virginia, Pennsylvania, Ohio, and Michigan. Karst terrain is present along portions of the pipeline route in Crawford, Seneca, Hancock, Wood, Henry, and Defiance counties, Ohio. These areas are illustrated on the figure included at the end of this plan.

2.0 KARST MITIGATION PLAN

2.1 Training

Rover will conduct environmental training sessions for all Rover construction management and contractor personnel prior to and during the pipeline installation. While this training will focus on implementation of best management practices contained in the Project plans, it will also include awareness training for karst-like features such as depressions, voids, caves, and sinkholes. The training will include the potential for unanticipated karst features that could be discovered during trenching operations. The training will also include protocol for work stoppage if a karst feature is discovered and notification to Supervisors.

Rover will employ full-time Environmental Inspectors for each construction spread for the duration of Project construction. One Lead Environmental Inspector will be assigned to each spread, and one Chief Environmental Inspector will be assigned to the entire Project. All Environmental Inspectors will report to Rover's Environmental Compliance Manager.

2.2 Karst Mitigation Measures

If a karst feature is identified during construction, the Environmental Inspector will direct the installation of additional erosion and sediment controls to minimize the potential for surface water runoff into the karst feature. A Project geotechnical engineer will be notified for a full evaluation of the feature and recommendation. Rover may consider a minor pipeline realignment, with notification to FERC staff, to avoid the feature. If a minor realignment is not feasible, karst mitigation measures may be warranted. The Project geotechnical engineer will determine on a case-by-case basis if geophysical or geotechnical testing is warranted.

The goal for construction and mitigation is to maintain natural rates of stormwater recharge following completion of the pipeline.

2.2.1 Best Management Practices

In addition to the standard erosion control Best Management Practices, where stormwater could flow into a sinkhole or cave two rows of silt fence will be utilized. Any springs or seeps along the right-of-way will be protected with one row of silt fence. Stormwater control measures will include detention,

diversion, or containerization to prevent construction influenced stormwater from flowing to the karst feature drainage point and these drainage points will not be utilized for the discharge of hydrostatic test water. Refueling of vehicles will not occur within 200 feet of any karst feature open to the surface.

2.2.2 Remediation Measures

It is likely that sand backfill, grouting or inverted filter measures would be used to stabilize the area.

Sand Backfill
Vegetation would be removed and clean sand would be placed in the void. This could be used on areas of closed depressions without visible voids at the ground surface or with voids open at the ground surface. It is likely these areas would be in the work area and not the actual pipeline excavation.

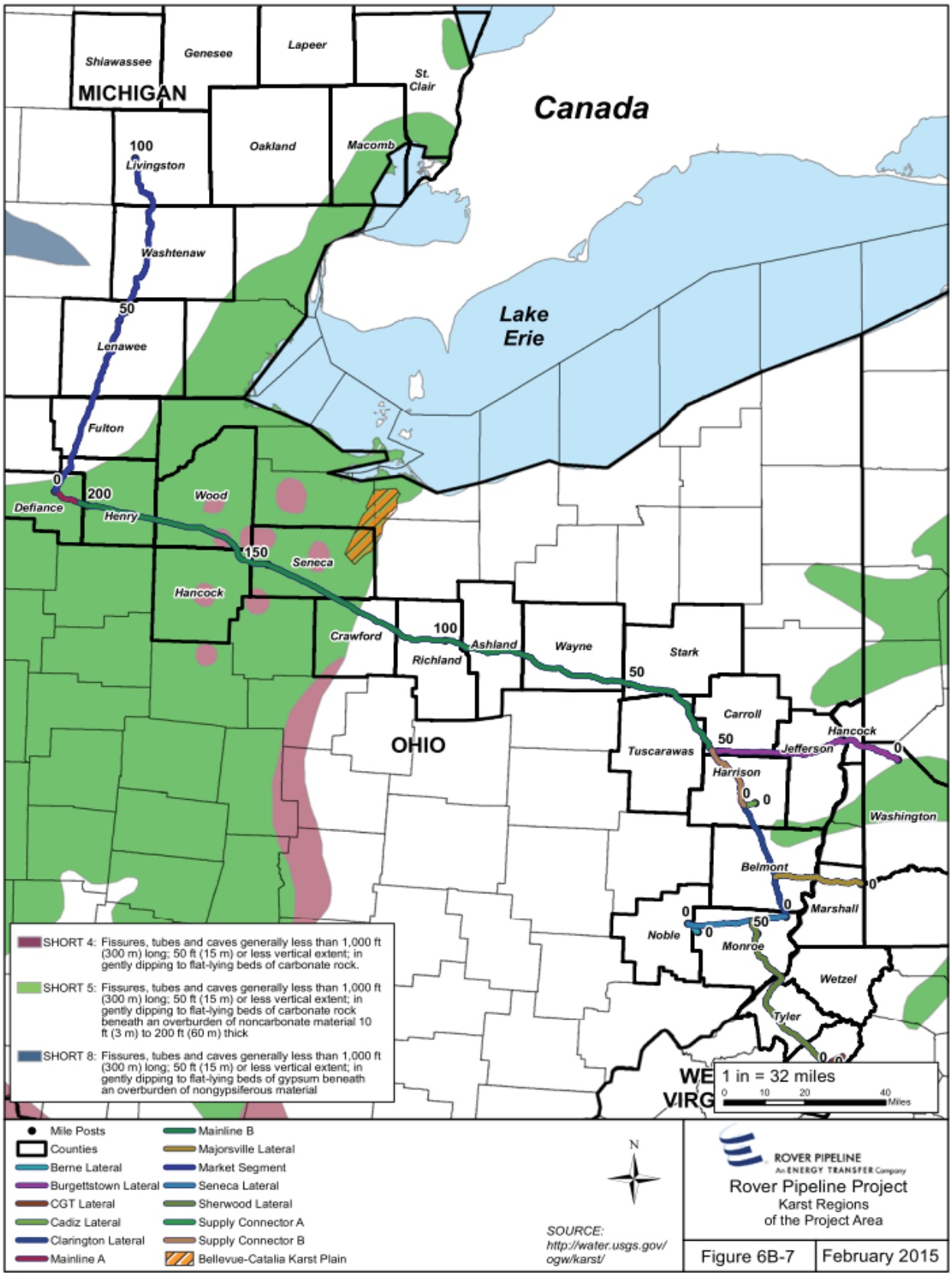
Grouting
Compaction grouting may be used with one or more points to seal the rock surface, fills voids and pushes into the loose, weak soil, compacting and strengthening it. Compaction grouting is typically completed in stages, from the bottom up.

Inverted Filter
The inverted filter approach is often used for sinkhole repair, especially when the sinkhole is not located near structures. The sinkhole area is excavated to expose either bedrock or the throat of the sinkhole. A course of rock large enough to bridge the throat of the sinkhole is placed at the bottom of the excavation. Courses of progressively finer rock and gravel are compacted above the base course. A geotextile fabric may be placed above the finest gravel course to prevent excessive loss of the uppermost course, which may consist of sand and/or soil. The inverted filter method provides filtration treatment of storm water and allows controlled storm water infiltration and groundwater recharge.

2.2.3 Monitoring

In karst-prone areas, Rover will offer landowners pre- and post-construction testing of water wells within 150 feet of the construction workspace and will test for yield and turbidity parameters. For any significant differences in the well yield between pre- and post-construction sampling that cannot be attributed to naturally occurring conditions, such as seasonal groundwater level fluctuations, Rover will compensate the landowner for the installation of a new well or otherwise arrange for provision of suitable water supplies. For water wells within 2,000 of a horizontal directional drill (HDD) location, Rover will offer landowners the same pre- and post-construction monitoring.

For springs located hydrologically downgradient of an HDD location, Rover will visually observe water conditions for turbidity before each construction day, mid-day, and at the end of each day. If signs of visual turbidity are identified, the environmental inspector will consult with the drilling HDD foreman regarding drilling fluid loss. If drilling fluid loss is identified, the HDD Contingency Plan will be used.


MICHIGAN
Shiawassee
Genesee
Lapeer
St. Clair
Canada
Oakland
Macomb
100
Livingston
Washtenaw
50
Lenawee
Lake Erie
Fulton
0
200
Defiance
Henry
Wood
150
Seneca
Hancock
Crawford
100
Richland
Ashland
Wayne
Stark
50
OHIO
Carroll
Tuscarawas
50
Jefferson
Hancock
0
Harrison
0
0
Washington
Belmont
0
Marshall
0
0
50
Noble
0
Monroe
Wetzel
Tyler
0
0
WE
VIRG
1 in = 32 miles
0 10 20 40 Miles
SHORT 4: Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; in gently dipping to flat-lying beds of carbonate rock.
SHORT 5: Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; in gently dipping to flat-lying beds of carbonate rock beneath an overburden of noncarbonate material 10 ft (3 m) to 200 ft (60 m) thick
SHORT 8: Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; in gently dipping to flat-lying beds of gypsum beneath an overburden of nongypsiferous material
Mile Posts
Counties
Berne Lateral
Burgettstown Lateral
CGT Lateral
Cadiz Lateral
Clarington Lateral
Mainline A
Mainline B
Majorsville Lateral
Market Segment
Seneca Lateral
Sherwood Lateral
Supply Connector A
Supply Connector B
Bellevue-Catalia Karst Plain
N
SOURCE: http://water.usgs.gov/ogw/karst/
ROVER PIPELINE
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Rover Pipeline Project
Karst Regions
of the Project Area
Figure 6B-7
February 2015