



C.P.F. No. 1-2023-053-NOPSO
Corrective Measure 16
Direct Current Voltage Gradient (DCVG) Surveys
DCVG Survey Results – Report 8

Purpose

This document summarizes the results obtained by Mountain Valley Pipeline, LLC (Mountain Valley) during DCVG Survey 13 in compliance with Corrective Measures 14 (Reports/Results) and 16 (ACVG/DCVG Surveys) of the Consent Agreement in the above-captioned proceeding.

Scope

Corrective Measure 16 requires Mountain Valley to:

- Prior to commissioning, conduct direct current voltage gradient (DCVG) surveys, alternating current voltage gradient (ACVG) surveys or other comparable inspections, tests, or surveys to assess the condition of coating on all installed pipe segments of the Mountain Valley Pipeline, except for those installed and tested after January 1, 2023; and
- After completing the survey, remediate any damaged coating indications found during the assessments that are classified as severe indications with voltage (IR) drop greater than 60 percent for DCVG or 70 dB μ V for ACVG, as provided in 49 C.F.R. § 192.461(h), or severe based on NACE SP 0502-2010.

Survey 13 encompassed 12.1 miles of pipe installed on Spread E between mile post (MP) 128.2 and MP 140.3.

Data Collection

- Mountain Valley conducted DCVG Survey 13 in accordance with NACE SP 0502-2010, “Pipeline External Corrosion Direct Assessment Methodology” using Roberts Corrosion Services (RCS) as the qualified corrosion control personnel conducting the data collection and analysis.
- One survey crew from RCS conducted the entirety of this DCVG survey.
- The initial data collection phase of this effort was completed on November 8.

Data Analysis

- After completing the initial data collection phase of DCVG Survey 13, the data was analyzed by a NACE Cathodic Protection Specialist (CP-4) to determine the voltage (IR)

drop associated with each indication identified during the survey. There were no anomalies over 60%.

Excavation and Repair

After completing the data analysis phase of Survey 13, Mountain Valley performed excavations to validate the survey results and determine the size of the indications. The locations and findings associated with the three excavations performed are contained in Table 1 below.

Excavation E1

- Mountain Valley conducted Excavation E1 on December 1, 2023. The pipe was exposed and visually inspected to locate the coating anomalies. The pipe was also holiday tested in accordance with the requirements in MVP Standard 10.4, "Corrosion Control for Construction" Section 3.6.2, "Holiday Detection", MVP Exhibit O, "Corrosion Control Plan", which are consistent with NACE Standard SP 0188-2006, "Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates," to ensure all anomalies were located on this region of pipe.
- Inspection showed the 24.88% indication was the result of three small holidays on the pipe. Each of these holidays were less than 1/4" inch squared.
- The coating was repaired per the requirements in MVP Standard 10.4, "Corrosion Control for Construction" Section 3.6.3 "Holiday Repair."
- Prior to backfill, the pipe was again holiday tested per the specifications and standards identified above to ensure no holidays existed on the exposed portion of pipe.

Excavation E2

- Mountain Valley conducted Excavation E2 on December 1, 2023. The pipe was exposed and visually inspected to locate the coating anomalies. The pipe was also holiday tested in accordance with the requirements in MVP Standard 10.4, "Corrosion Control for Construction" Section 3.6.2, "Holiday Detection", MVP Exhibit O, "Corrosion Control Plan", which are consistent with NACE Standard SP 0188-2006, "Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates," to ensure all anomalies were located on this region of pipe.
- Inspection showed the 22.08% indication was the result of a holiday approximately 4 inches in length with only a portion exposing bare metal.
- The coating was repaired per the requirements in MVP Standard 10.4, "Corrosion Control for Construction" Section 3.6.3 "Holiday Repair."
- Prior to backfill, the pipe was again holiday tested per the specifications and standards identified above to ensure no holidays existed on the exposed portion of pipe.

Excavation E3

- Mountain Valley conducted Excavation E3 on December 13, 2023. The pipe was exposed and visually inspected to locate the coating anomalies. The pipe was also holiday tested in accordance with the requirements in MVP Standard 10.4, "Corrosion Control for Construction" Section 3.6.2, "Holiday Detection", MVP Exhibit O, "Corrosion Control Plan", which are consistent with NACE Standard SP 0188-2006, "Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates," to ensure all anomalies were located on this region of pipe.
- Inspection showed the 50.07% indication was the result of multiple small holidays along the top of the pipe for the length of the excavation. Less than 2 square inches of metal was exposed.
- The coating was repaired per the requirements in MVP Standard 10.4, "Corrosion Control for Construction" Section 3.6.3 "Holiday Repair."
- Prior to backfill, the pipe was again holiday tested per the specifications and standards identified above to ensure no holidays existed on the exposed portion of pipe.

Table 1: DCVG Survey 13 Calibration Dig Locations

Survey Number	Excavation Number	Latitude	Longitude	Calculated IR Drop	Results
13	E1	(b) (7)(F)	(b) (7)(F)	24.88%	Less than 1 in ²
13	E2	(b) (7)(F)	(b) (7)(F)	22.08%	4-inch scrape with small amounts of bare metal exposed
13	E3	(b) (7)(F)	(b) (7)(F)	50.07%	Less than 2 in ²

Further Investigation

- While the pipe was exposed at Excavation E1, a number of small pinholes were identified along the top 1/3 of the pipe Mountain Valley determined that, although the amount of bare metal exposed is not a concern due to the capabilities of the cathodic protection system designed for the pipeline, it was in the best interest of the company to perform additional excavations to determine the extent of condition. The results of these additional excavations are outlined below.

Excavation E4

- Mountain Valley conducted Excavation E4 on December 20, 2023. The pipe was exposed and visually inspected to locate the coating anomalies. The pipe was also holiday tested in accordance with the requirements in MVP Standard 10.4, "Corrosion Control for Construction" Section 3.6.2, "Holiday Detection", MVP Exhibit O, "Corrosion Control Plan", which are consistent with NACE Standard SP 0188-2006, "Discontinuity (Holiday)

Testing of New Protective Coatings on Conductive Substrates,” to ensure all anomalies were located on this region of pipe.

- Inspection showed the 10.63% indication was the result of small holidays present along the top of the exposed pipe. Less than 2 square inches of bare metal was exposed.
- The coating was repaired per the requirements in MVP Standard 10.4, “Corrosion Control for Construction” Section 3.6.3 “Holiday Repair.”
- Prior to backfill, the pipe was again holiday tested per the specifications and standards identified above to ensure no holidays existed on the exposed portion of pipe.

Excavation E5

- Mountain Valley conducted Excavation E5 on January 3, 2024. The pipe was exposed and visually inspected to locate the coating anomalies. The pipe was also holiday tested in accordance with the requirements in MVP Standard 10.4, “Corrosion Control for Construction” Section 3.6.2, “Holiday Detection”, MVP Exhibit O, “Corrosion Control Plan”, which are consistent with NACE Standard SP 0188-2006, “Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates,” to ensure all anomalies were located on this region of pipe.
- Inspection showed the 11.85% indication was the result of two small holidays at the 5:00 and 7:00 position as well as several smaller holidays along the top third of the pipe, similar to Excavation E1. Less than 2 square inches of bare metal was exposed.
- The coating was repaired per the requirements in MVP Standard 10.4, “Corrosion Control for Construction” Section 3.6.3 “Holiday Repair.”
- Prior to backfill, the pipe was again holiday tested per the specifications and standards identified above to ensure no holidays existed on the exposed portion of pipe.

Conclusion

Although small holidays were present along the top of the pipe at each excavation, it was determined, based on the five excavations performed, further analysis and repairs are not required for the remaining indications identified during the survey. Based on the amount of exposed metal present at the excavations performed, analysis shows any exposed metal at the remaining locations is well within the conservatisms used in the design of the cathodic protection system for this section of the pipeline.

Key Contacts

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