

August 30, 2019

Via Electronic Mail

Mr. Scott R. Williamson
Program Manager, Waterways & Wetlands Program
Pennsylvania Department of Environmental Protection
Southcentral Regional Office
909 Elmerton Avenue
Harrisburg, PA 17110-8200

**Re: IR Root Cause Supplement
DEP HDD Re-Evaluation Report
Old U.S. 220 16" Horizontal Directional Drill (S2-0109-16)
Permit No. E07-459
Blair Township, Blair County**

Dear Mr. Williamson:

In compliance with the Corrected Stipulated Order dated August 10, 2017 a Re-Evaluation Report for the above-referenced horizontal directional drill (HDD) was submitted to the Pennsylvania Department of Environmental Protection (Department) on February 12, 2019. In a letter dated March 28, 2019, the Department requested further information, to which SPLP provided a response on May 22, 2019. In response to a conference call with Department staff on August 21, 2019 discussing the IR root cause analysis section of Re-Evaluation report, SPLP submits the following discussion for your consideration.

The February 2019 Re-Evaluation Report included the following discussion regarding the IR events occurring during installation of the 20-inch pipeline:

ROOT CAUSE ANALYSIS FOR THE 20" PIPE INSTALLATION IR

Three (3) IR events occurred during completion of this HDD. One IR during the pilot drilling at 320 ft before exiting; a second IR event immediately before exiting (a "Punch Out" IR), and a third during exiting of the 30 inch reaming tool immediately at the exit point. Based upon a review of the drilling records the shallow profile depth and clogging of the annulus attributed to the occurrence of these events.

Per our conversation, SPLP understands the Department recognizes that two of the IR events are associated with drilling tools exiting the profile while at minimal depth below ground, and the difficulties managing IR events of this type. What is of concern to the Department and requires further explanation is the IR occurring at HDD Station 14+50 on the 20-Inch profile.

The pilot phase drilling for installation of the 20-inch pipeline commenced on June 22, 2017, and was completed on July 1, 2017. The IR event above HDD Station 14+50 occurred on June 28, 2017. This

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time frame is before SPLP mandated the use of an Annular Pressure Monitoring (APM) tool during pilot phase drilling, and established an enhanced HDD monitoring program and set of Best Management Practices (BMP) for implementation during all phases of an HDD.

As stated in the Re-Evaluation report, the inspection reports for this HDD recorded a loss of circulation before observation of the IR at this location, which was attributed to a “clogged annulus”.

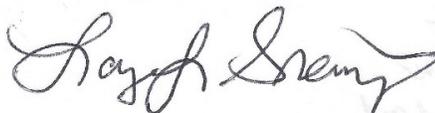
The lack of an APM tool during the pilot phase drilling of this HDD negatively affected the ability to monitor conditions in real time, which in turn likely contributed to the occurrence of the IR. Without an APM tool, the driller and drilling inspectors are relying on the simple observation of fluid returns at the entry pit to detect a down hole problem requiring immediate corrective action. At 1,450 foot of distance from entry, the fluid return time from the tool face to the entry pit is a minimum of 10 minutes. As a result, there is a time delay between the actual clogging event which induced the IR and observation of the clogging by lack of returns at the entry pit. Under standard HDD drilling procedures for rock drilling, the driller was likely flowing approximately 350 gallons per minute through the drill stem to run the mud motor, requiring a minimum of 1,500 pounds per square inch (psi) or more pump pressure. At this flow rate and pressure a clogged annulus would induce an IR to the land surface before the loss of returns would be observed at the HDD entry.

This IR event during installation of the 20-inch pipeline is similar in aspects to multiple other HDD IR occurrences on the Mariner project prior to SPLP mandating the use of monitoring tools and implementation of enhanced monitoring and BMPs for use to respond to losses of circulation and IR events.

As stated in the Re-Evaluation report, the use of an APM tool and implementation of the drilling BPM are now mandated, not optional, and SPLP relies on these procedures and diligence of the inspection staff to minimize or prevent the occurrence of IRs during HDDs.

SPLP submits that we have been, and are, in complete compliance with the agreed terms and analysis requirements of the Order, as agreed to by the Department, and that no further analysis is required for the Department to consent to the start of this HDD. SPLP requests that the Department approve the Re-evaluation Report for Old U.S. 220 Highway Crossing HDD (S2-0109-16) as soon as possible.

Sincerely,



Larry J. Gremminger, CWB
Vice-President – Environmental, Health & Safety
Energy Transfer Partners
Mariner East 2 Pipeline Project