Quarterly Report – Public Page

Date of Report: 4th Quarterly Report, September 29, 2023 Contract Number: 693JK32210002POTA Prepared for: Government Agency: DOT and Co-funders Project Title: Monitoring the Long-Term Compatibility of Vapor Corrosion Inhibitor and Cathodic Protection Associated Components Prepared by: Pipeline Research Council International, Inc. Contact Information: Dorothy Lam, email: <u>dlam@prci.org</u> For quarterly period ending: September 30, 2023

1: Items Completed During this Quarterly Period:

Item	Task	Activity/Deliverable	Title	Federal	Cost
#	#			Cost	Share
10	1	Complete analysis of the environmental well water samples	Results to be included in quarterly report	\$7,008	\$7,008
17	5	Quarterly status report & project management	Submit 4 th quarterly report	\$6,954	\$6,954

2: Items Not Completed During this Quarterly Period:

Item	Task	Activity/Deliverable	Title	Federal	Cost
#	#			Cost	Share
11	2	Start field testing with the tanks that have been treated with VCIs, install ER probes and mass-loss coupons as needed	Summary to be included in quarterly report	\$24,053	\$24,053
12	2	Start field testing with the tanks that are to be treated with the VCIs during the project course, install mass-loss coupons and ER probe in a dense configurations	Summary to be included in quarterly report	\$26,288	\$26,288
14	2	Setup and start large scale VCI dispersion experiments	Details of the experimental setup to be included quarterly report	\$28,788	\$28,788
15	4	Setup and start laboratory scale experiments to determine VCI and non-sand pad material compatibility	Details of the laboratory scale experiments to be included in the quarterly report	\$16,288	\$16,288

Item	Task	Activity/Deliverable	Title	Federal	Cost
#	#			Cost	Share
16	3	<i>Collect initial field data to evaluate</i> <i>VCI and CP compatibility</i>	Summary to be included in	\$3,258	\$3,258
			quarterly report		

3: Project Financial Tracking During this Quarterly Period:

Note that this chart reflects Federal share only.





4: Project Technical Status:

The following activities were undertaken:

Item 10, Task 1 — Complete analysis of the environmental well water samples, Results to be included in quarterly report: The water sample analysis has been completed. The water samples were analyzed for the chemical markers such as dissolved ammonia and ammonium ions. Figure 1(a) shows dissolved ammonium and ammonia concentrations in the well water samples, and Figure 1(b) shows correlation between ammonia and ammonium in the standard solutions that were prepared using 5000, 500, and 50 ppm of VCI chemistry in deionized water. As seen in Figure 1(b), there is a linear correlation between

ammonia and ammonium in presence of VCI chemistry, no such correlation is observed in the well water samples. In addition, the well water samples have ammonia concentrations less than 0.1 ppm; it is inferred from these two observations (very low dissolved ammonia concentration, and no correlation between the ammonia and ammonium) that presence of VCIs in the well-water samples is unlikely.



Figure 1. Dissolved ammonium versus ammonia in (a) well water samples, and in (b) solutions prepared using 5000, 500, and 50 ppm of VCI chemistry plus deionized water.

This activity has been completed, and it satisfies item 7 in Attachment 2 Project Deliverables. It also links to item 5 as listed in Attachment 1 Project Team Activities.

Item 17, Task 5 — Quarterly status report & project management, Submit 4th quarterly report: The 4th quarter project meeting was held on September 20, 2023 This item has been completed, and it links to item 25 in Attachment 2 Project Deliverables. It also links to items 11 and 13 in Attachment 1 Project Team Activities.

5: Project Schedule:

The following items were not completed in the third quarter due to various reasons.

Item 11, Task 2 — Start field testing with the tanks that have been treated with VCIs, install ER probes and mass-loss coupons as needed, Summary to be included in quarterly report: The field testing plans have been developed, and various materials and supplies have been procured. A total of approximately 24-25 tanks were identified for the field testing, and the testing has been started on 14 tanks. The field testing for the remaining 10-11 tanks will be started during the 5th quarter of the project. The field testing for the remaining tanks was postponed due to other construction and maintenance needs that emerged at the tank operator facility where field testing has been planned.

Item 12, Task 2 — Start field testing with the tanks that are to be treated with the VCIs during the project course, install mass-loss coupons and ER probe in a dense configurations, Summary to be included in

quarterly report: This task is dependent on the tank operators' schedule for VCI treatment of the existing tanks. The project team is in discussion with the tank operators who plan to introduce VCI in their tanks. One of the tans operators has identified approximately 4-5 tanks where VCIs will be applied on the inservice tanks. It is expected that this field testing will commence sometime in the next two quarters.

Item 14, Task 2 — Setup and start large scale VCI dispersion experiments, Details of the experimental setup to be included quarterly report: The project plan was to start two large-scale VCI dispersion experiments. Of the two, one large-scale experiment has been started, and second one will be started in the early next quarter. Details of the first large-scale experiment are included in Appendix. The second large-scale test could not be started because the sand procured for the experiment became wet due to the weather conditions. Because moisture control is an important parameter for the controlled VCI dispersion studies, it was decided to re-dry the sand, and then rewet it by controlling the amount of water added to the sand. For this reason, start of the second experiment has been delayed.

Item 15, Task 4 — Setup and start laboratory scale experiments to determine VCI and non-sand pad material compatibility, Details of the laboratory scale experiments to be included in the quarterly report: The direction of this experiments has been changed compared to the initial plans. It was initially decided to use a clay pad as non-sand pad material for VCI migration, but since then it has been determined that most operators do not use clay pads. Therefore, new plans include using a concrete pad for the VCI migration studies. Because of the change in direction, start of this experiment has been delayed. This experiment will be redesigned and started during the next two quarters.

Item 16, Task 3 — Collect initial field data to evaluate VCI and CP compatibility, Summary to be included in quarterly report: The field data for this item comes from the tank operators and the data has not been made available to us yet, it will become available towards the end of the fifth quarter. For this reason, this item was not completed in the 4^{th} quarter.

The project is behind schedule due to the various reasons explained above.