Quarterly Report – Public Page

Date of Report: 6th Quarterly Report-March 30, 2024 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: dlam@prci.org For quarterly period ending: March 31, 2024

1: Items Completed During this Quarterly Period:

Item	Task	Activity/Deliverable	Title	Federal	Cost
#	#			Cost	Share
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
16	3	<i>Collect initial field data to evaluate</i> <i>VCI and CP compatibility</i>	Summary to be included in quarterly report	\$3,258	\$3,258
18	2	Collect quarterly field data for the field testing started under items 10 & 11	Summary to be included in quarterly report	\$9,015	\$9,015
21	2	Monitor progress of the various field testing	Process of testing to be summarized in quarterly report	\$3,258	\$3,258
22	3	Collect various CP survey data on the tanks treated with VCIs	Summary of the data to be included in the quarterly report	\$1,303	\$1,303
23	5	Quarterly status report & project management	Submit 6 th quarterly report	\$13,603	\$13,603

2: Items Not Completed During this Quarterly Period:

Item	Task	Activity/Deliverable	Title	Federal	Cost
#	#			Cost	Share
20	4	Inject VCIs in the laboratory and	Summary to be	\$3,258	\$3,258
		large-scale experiments	included in		
			quarterly report		

3: Project Financial Tracking During this Quarterly Period:

Note that this chart reflects Federal share only.



Quarterly Payable Milestones/Invoices - 693JK32210002POTA

4: Project Technical Status:

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 was delayed. This experiment has been redesigned, and was started in this (6^{th}) quarter. The experiments included two control and one VCI migration study experiment, thus a total of three experiments. The two control experiments included with and without VCIs. In the first control experiment, a 30-ppm chloride solution was prepared and applied throughout the experimental tub surface where water-absorbing paper was laid, and A36 carbon-steel coupons were placed on the tub surface. In addition, and ER probe was also placed. In the second experiment, VCI was applied throughout the water-soaked paper surface. In the third experiment, the VCI was applied only on half surface of the water-soaked paper surface. A schematic of the experiment setup is presented in Figure 1(a), a setup step of the without-VCI control experiment is in Figure 1(b), and complete setup of the without-VCI control experiment is depicted in Figure 1(c). The first two experiments will provide VCI's effectiveness when applied in powder form, and the third experiment data will help understand VCI migration when VCI powder application coverage is partial. This item has been completed, and it satisfies item 11 in Attachment 2 Project Deliverables. It also links to item 10 as listed in Attachment 1 Project Team Activities.



Item 16, Task 3 — Collect initial field data to evaluate VCI and CP compatibility, Summary to be included in quarterly report: The initial plan was to get the data for year 2022 and additional data for year 2023 under item 22, but the tank operator provided the data for both years 2022 and 2023 together. The data are described. Figure 2(a) shows the rectifier current output that were collected under PRCI

Phase 2 project, and Figure 2(b) shows addition two years of the rectifier current output data for the same tanks as in Figure 1(a). Similarly, Figure 3(a) shows the groundbed resistance data that were collected under PRCI Phase 2 project, and Figure 3(b) shows addition two years of the groundbed resistance data for the same tanks as in Figure 3(a). This item has been completed, and it satisfies item 12 in Attachment 2 Project Deliverables. It also links to item 8 as listed in Attachment 1 Project Team Activities.





Item 18, Task 2 — Collect quarterly field data for the field testing started under items 10 & 11, Summary to be included in quarterly report: This item description, i.e., Activity/Deliverable, was mistyped in Attachment 3, and the project team meant the field testing started under items 11 and 12. The field

testing for the VCI-treated tanks and tanks recently treated with VCIs was started in the 5th quarter. The monitoring data from the previously and recently (5th quarter) VCI-treated tanks have been collected by the tank operators who provided in-kind support for the field testing. The data is collected quarterly, so only one data point per test location is available. As additional data becomes available in the next quarter, an analysis of the monitoring data will be performed. This item has been completed, and it satisfies item 13 in Attachment 2 Project Deliverables. It also links to items 6 and 7 as listed in Attachment 1 Project Team Activities.

Item 21, Task 2 — Monitor progress of the various field testing, Process of testing to be summarized in quarterly report: This item's deliverable description, i.e., Title, was mistyped in Attachment 3, and the project team meant Progress of testing to be summarized in quarterly report. The field testing for the VCI-treated tanks and tanks recently treated with VCIs was started in the 5th quarter. The field sand samples from the previously treated VCI tanks have been received and analyzed. The field sand samples from the recently-treated-with-VCI tanks have also been received and will be analyzed in the next quarter. The field testing is going as planned. This item has been completed, and it satisfies item 15 in Attachment 2 Project Deliverables. It also links to items 6 and 7 as listed in Attachment 1 Project Team Activities.

Item 22, Task 3 — Collect various CP survey data on the tanks treated with VCIs, Summary to be included in quarterly report: The CP survey data for the VCI treated tanks became available during early 6^{th} quarter. The data presented in Figures 2 and 3 above span both years 2022 and 2023. The item 16 was designed for only year 2022 and the item 22 was for year 2023. Since both years' data were provided together, the graphical presentation of the data under item 16, Task 3 (Figures 2 and 3) include the data for this item as well. This item has been completed, and it satisfies item 15 in Attachment 2 Project Deliverables. It also links to item 8 as listed in Attachment 1 Project Team Activities.

Item 23, Task 5 — Quarterly status report & project management, Submit 6th quarterly report: The 6th quarter project meeting was held on March 21, 2024. This item has been completed, and it partly satisfies item 25 in Attachment 2 Project Deliverables. It also links to item 13 as listed in Attachment 1 Project Team Activities. The meeting minutes in Appendix link to item 11 as listed in Attachment 1 Project Team Activities.

5: Project Schedule:

Item 20, Task 4 — Inject VCIs in the laboratory and large-scale experiments, Summary to be included in quarterly report: The revised design of the laboratory experiments to VCI migration in the clay-like pads include VCI delivery at the start of the experiments. Thus, VCI injections in the laboratory experiments have been completed. Regarding the two large-scale experiments, VCI injection schedule is determined based of ER probe data. The VCI injections in the first and second large-scale experiments are expected early and late next quarter, respectively.

Overall, the project is a bit behind schedule, but activities will catch up in the next quarter.