

PHIL-27754

April 17, 2023

Project Number 08005-WE04

Ms. Sarah Kloss (3HS11)
United States Environmental Protection Agency
Four Penn Center
1600 John F. Kennedy Boulevard
Philadelphia, Pennsylvania 19103

Reference: Contract No. N6247016D9008
Contract Task Order (CTO) No. WE04

Subject: Response to Comments on the Draft Technical Memorandum – Modifications Implemented and Recommended Changes for Continued Operation of the In-Situ Anaerobic Bioremediation System for Site 5 – Former Fire Training Area
Former Naval Air Station Joint Reserve Base Willow Grove
Horsham Township, Pennsylvania

Dear Ms. Kloss:

On behalf of the Navy, Tetra Tech is pleased to provide the following response to EPA comments received on March 28, 2023 for the Draft Technical Memorandum – Modifications Implemented and Recommended Changes for Continued Operation of the In-Situ Anaerobic Bioremediation System for Site 5 – Former Fire Training Area, dated December 22, 2022.

Comments from EPA Hydrogeologist, Nate Doyle:

I do not have any concern in principle with the adjustments made or the proposed modifications to the Site 5 ISB System. However, the following questions should be considered.

1. How are the proposed new injection wells and the extraction well interconnected? Is there expected to be actual recirculation, allowing the extraction well to directly draw amendments through the treatment area from the injection wells, or is the extraction and reinjection hydraulically separated in the aquifer?

Response: *The water that is extracted from the selected extraction well (which, based on previous performance, is expected to have sufficient yield) will be amended with a biochemical carbon substrate and a pH adjuster prior to being injected into the newly selected injection wells. The recirculation path via these newly selected injection wells is expected to be hydraulically aligned with key monitoring wells with the highest current VOC concentrations within the targeted plume area. Recirculation, as directed by the O&M plan, will be performed for a one-month period; during this timeframe amendments are expected to be distributed within the plume and towards the extraction well to impact the areas of highest concern.*

2. How is the proposed new extraction/injection well network interconnected with the contaminant plume? Will the new arrangement be able to deliver amendment to all treat the whole plume (both vertical and horizontal)?

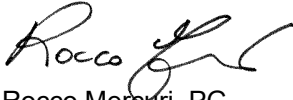
Response: *The currently proposed extraction/injection network should distribute the amendment within the plume and, specifically, target hot spot areas with both horizontal and vertical influence. The modifications that were performed in 2022 included modifications and upgrades to the piping infrastructure and instrumentation to better facilitate continuous operations. The extraction and injection*

wells were also field tested in 2022 to evaluate sustainable and operational extraction and injection rates. Additionally, a recommendation was made to employ a soluble substrate in lieu of an emulsified oil substrate for upcoming injections to provide improved system reliability, operational ease, and enhanced subsurface distribution while continuing to add sufficiently potent dosages of carbon for microorganisms to biodegrade the VOC contaminants in the subsurface.

It should be noted that the original pilot test (2011) followed by the full-scale plan (2015) was designed for flexibility with the option of strategically switching among extraction and injection wells over the remediation timeframe. The current configuration and operations will be evaluated at select time intervals over a six-month timeframe for groundwater chemical, biochemical, and microbial response data. These data will be evaluated to decide whether further modifications and switching among the injection and extraction well network is warranted to further enhance treatment completeness and effectiveness within the targeted plume.

Please do not hesitate to contact me if you have any questions.

Sincerely,



Rocco Mercuri, PG
Senior Project Manager

RM/nfs

c: Brian Helland (Navy BRAC PMOE)
Dawn DeFreitas (Navy BRAC PMOE)
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