UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

March 20, 2019

Pete Haid
Senior Director of Environmental
Tradepoint Atlantic
1600 Sparrows Point Boulevard
Baltimore, Maryland 21219

VIA Electronic Mail

Re: Former COA IM Supplemental Investigation Work Plan
Tradepoint Atlantic, Baltimore, MD
EPA ID No. MDD053945432

Dear Mr. Haid:

The purpose of this letter is to document the Environmental Protection Agency's (EPA) and Maryland Department of the Environment (MDE) review and response to the Former Coke Oven Area Interim Measure Supplemental Investigation Work Plan (COA Workplan), for the Sparrows Point Terminal LLC (Tradepoint Atlantic or TPA) Baltimore, Maryland site. The COA Workplan was submitted via electronic mail on March 8, 2019 in response to an email request submitted February 21, 2019 from EPA requesting an onshore groundwater evaluation of both the Coke Oven Area and Rod & Wire Mill. This correspondence is specific to the COA Workplan.

The onshore groundwater evaluation is part of the ongoing process to assess the effectiveness of operating Interim Measures and their ability to meet Corrective Action COA objectives. The principal objectives of the IMs at the time of their installation was to protect surface water (Cells 2, 3, and 5) from contaminated groundwater discharges and reduce source hydrocarbon mass (Cells 1, 4 and 6). The COA offshore assessment will provide the data to evaluate the first objective. Up to the present the sole means of monitoring progress on the second objective was reporting total mass removed on a continuing basis. Based on that metric, IMs operating at Cells 1, 5, and 6 make progress. However, IMs at Cells 2 and 3 are currently less successful and TPA has shut down operation of Cell 3 and the shallow groundwater remedy at Cell 2. Furthermore, based on other metrics, i.e. downgradient well concentrations, groundwater capture, and surface water impacts it is likely the IMs at Cell 5 and Cell 2 intermediate groundwater are not meeting COA groundwater remediation objectives.

Mr. Pete Haid
March 20, 2019

The stated primary objective of the COA Workplan is the delineation of dissolved phase hydrocarbons at Cells 2, 3 and 5. Additionally, the implication, based on a proposal to collect geochemical parameters at Cell 2 area, is that TPA is pursuing the implementation of other remedies for intermediate groundwater, possibly Monitored Natural Attenuation. It is the Agencies' desire to optimize and improve IMs to meet COA groundwater objectives and not expend resources delineating plumes that have been characterized multiple times since 2000 up to the 2015 report submitted by Key Environmental. This is not to suggest that further delineation is unnecessary, just that delineation should not be the primary focus of the COA Workplan.

EPA believes one of the issues underlying the apparent cross-purpose of TPA and the Agency is that no numerical cleanup endpoint has been agreed upon and therefore each has proceeded with different objectives. Without specific cleanup endpoints TPA has ceased operation of IMs, proposed others for shutdown (Cell 5) and is pursuing alternate remedies, i.e. MNA. You may recall that in 2018 EPA drafted a memorandum stating that groundwater under the Sparrow's Point Peninsula cannot be used as drinking water and therefore does not have to be restored to drinking water standards. However, while the groundwater does not have to be restored to drinking water standards, contaminated groundwater continues to discharge to surface water and volatilize to the atmosphere. Numerical cleanup goals for groundwater will need to be developed for both exposure pathways. For example, based on risk to future occupants of the site, given the development of the entire property, the Agencies note the following risk-based groundwater concentrations as preliminary groundwater cleanup values at COA based on EPA's Vapor Intrusion Screening Levels (VISL):

Commercial Groundwater VISLs (ug/L) set to cumulative $1x10^{-5}$ and cumulative HQ = 1 (both noncancer chemicals are neurotoxins)

Benzene	23
Ethylbenzene	50
Naphthalene	67
Toluene	40,000
Xylenes	810

Based on the above it is readily apparent that none of the IMs operating are near meeting a specific groundwater cleanup endpoint and while IMs at some Cells are inefficient, shutdown is not an option; optimization and expansion are required. With the above as the goal the Agencies submit the following detailed comments:

1. It has been pointed out previously that the effect of the Graving Dock Pump overwhelms any remedy at Cell 2, based on both the 750 gallons per minute (gpm) pump rate and effluent benzene concentrations requiring treatment. If there were no surface water between Cell 2 and the Graving Dock Pump there would be no issue, however there is, and it is likely

groundwater is impacting surface water based on surface water detections. If TPA continues to operate the Graving Dock Pump then a more protective remedy is necessary, i.e. a slurry wall as recommended in the 2015 Key report. Short of an impermeable wall the current extraction well configuration is insufficient. The reported rate of 2.3 gpm from the Intermediate zone in 2018 will not intercept groundwater drawn from COA to the Graving Dock Pump. Extracting groundwater at that rate will not affect shallow groundwater at Cell 2. It's questionable whether intermediate groundwater extraction at Cell 2 has ever affected shallow groundwater; previous studies conclude otherwise. However, nested wells proposed downgradient of the interception trench and to the immediate west will provide data on an ongoing basis as to the effectiveness of the interception trench and those proposed wells are approved. The Agencies request the remainder of the proposal be implemented as a secondary phase and request that the extraction rate of the pumping configuration be immediately maximized approaching the design parameter versus the minimal rate reported from 2018. TPA may pursue other remedial options but with current data from the Graving Dock and surface water detections it is unlikely a passive remedy, i.e. MNA will meet objectives. Finally, the remedy as currently implemented does not address the dissolved phase plume between the Benzol Process Area and Cell 2. In addition to maximizing the extraction rate of the current configuration TPA should investigate expansion of groundwater remediation to the south.

2. Based on design documents the interception trench at Cell 3 is installed to a depth of from 20 to 22 feet. The system was placed in operation in August of 2010 and historically was more productive. The result from a single upgradient sample obtained from boring location CO130 to the northeast of the Cell 3 area indicates an absence of a connection between Cell 3 and the Benzol Process Area; this conclusion based on a single sample may or may not be true. TPA contends that the trench is likely not deep enough and proposed 10 piezometers to delineate the dissolved plume surrounding the trench.

   A review of boring and monitoring well details for existing wells indicate that the 100 series of wells surrounding Cell 3 trench are installed to depths from around 17 to 20 feet and that the nested CO30 wells are installed to 27.5 and 73 feet and downgradient of the trench. Based on the trend graph presented in the last progress report, CO30PZM15 is the only well never reporting declining concentrations. It appears the data from CO30PZM15 already confirms TPA's hypothesis that the trench is not deep enough. Since the stated objective is to identify the depth of contamination then EPA requests a single boring utilizing vertical profiling be installed at the proposed location to the west of CO102 PZM collecting groundwater samples at the top of the water table down to the intermediate zone, or until contaminants are not detected. As TPA proposed 9 additional piezometers, they should install these borings in a second phase subsequent to reporting the results from the initial boring. Elevated benzene concentrations were reported in surface water samples from the Cove Area. It is apparent the interception trench at Cell 2 does not protect surface water from groundwater discharge but will be confirmed or refuted with pore water results. The current remedy does not address the dissolved phase mass upgradient of the trench. It is

believed that once the data from pore water and the initial requested boring are available TPA can investigate expansion of a remedy in the Cell 3 area.

3. Cell 5 (Turning Basin side of former Coke Oven Area): Dual Phase Extraction (DPE) system and Dense Non-Aqueous Phase Liquid (DNAPL) recovery system for the shallow zone. These systems were operated for the majority of the year 2018, resulting in the removal of approximately 3,762 pounds of hydrocarbons from the Cell 5 area, 3,551 lbs. from DNAPL and 211 lbs. via the DPE system. PDI activities completed in 2015 focused on the horizontal and vertical delineation of DNAPL in an area located west of Cell 5, but no additional soil borings and/or monitoring wells were installed within the vicinity of Cell 5 to better delineate naphthalene impacts in the shallow groundwater zone. Groundwater from CO25-PZM008 sampled during the PDI investigation provided a naphthalene concentration of 3.71 parts per million (ppm) (or 9.370 ppm?). Investigation activities proposed, focus on the horizontal delineation of naphthalene in groundwater around well CO25-PZM008, the northern area around CO60-PZP001, and along the shoreline to determine if modifications to the existing system are warranted to modify the remediation process and/or mitigate impacts to surface water and sediment pore water.

   Historical analytical data from this area characterizes napthalene (and benzene) impacts to shallow groundwater upgradient, sidegradient, and downgradient of the DPE interception trench. The data demonstrate the system is either improperly installed, or poorly operated. Both the upgradient free product recovery wells and the DPE system remove hydrocarbon mass and admittedly the DPE system is inefficient, but overall they have had little effect on dissolved phase concentrations. Review of additional metrics, i.e. the pending offshore pore water sampling event, area well concentrations, and downgradient well concentrations suggest the interception trench does not meet remediation goals. Minimally the trench must prevent contaminant flow downgradient. Based on concentrations reported from CO 58, the system fails. Additionally, two monitoring wells to the north, CO 26 and CO 60 report napthalene concentrations that are unchanging over time. The concentrations reported from these wells suggest the trench is not installed far enough to the north.

   There are other unknowns, marginally related to plume definition, that could be answered. If 18000 gallons of water is extracted per day what is the capture zone? Additionally, if 18000 gallons per day is injected into the aquifer what are the effects? There is not enough groundwater data to answer either question. Water levels are somewhat elevated in monitoring well CO 24 – is this the result of the reinjection? There are three monitoring wells to the southeast and upgradient of the trench, CO 55, CO 57, and CO 59 that are relatively unimpacted. Do these define the southern extent of the dissolved phase plume or do they represent dilution effects from injecting 18000 gpd? All three regularly report higher groundwater levels than the wells to the north.

   Based on the limited mass removed by the DPE trench versus the large volume of water generated, the barely changing dissolved plume, and downgradient and side gradient well concentrations demonstrating the trench is ineffective, more groundwater data including

analytical data are necessary in the Cell 5 area. Piezometer installation should consider the above data gaps but moreover collect the data necessary to pursue other remedial options. As an example, DPE systems can be installed as a grid versus a trench and shallow groundwater in this area, approximately 20 feet, is beneficial to remediation. It is beyond the scope of this review to diagnose why the trench is ineffective but monitoring well results demonstrate it is. Any remedy in this area should decrease source mass, shrink the dissolved phase plume, and prevent groundwater discharge to the Turning Basin. The onshore investigation in Cell 5 should focus on data gaps and pursuing a final remedy for this area.

EPA requests that you proceed with the Supplemental Investigation at Coke Point remediation cells 2, 3, and 5. The request is based on the qualifiers as stated above. Plumes can be further defined as necessary, but the focus must be on remedy optimization and expansion. IMs have been operating at the various cells for various times but all greater than five years. IMs at Cells 2, 3, and 5 were installed to prevent groundwater discharge to surface water; it has never been demonstrated that objective was met. Results from pore water sampling will address that question. The IMs were never designed to address the great majority of the dissolved phase plumes in the three cells. Groundwater data demonstrate the three IMs do not wholly intercept contaminated groundwater. EPA's goal at the COA has always been to address historical groundwater contamination and proceed to Final Remedy. None of the three IMs are Final Remedies. Since no changes are proposed other than a phasing of the drilling effort, no workplan revision is necessary. Please begin the implementation of the workplan. If you have any questions, please contact me at (410) 305-2779 or by email at *weissbart.erich@epa.gov*.

Sincerely,

Erich Weissbart

Erich Weissbart, P.G.
Project Manager
Office of Land and Chemicals Division

c: James Calenda, EAG
Russ Becker, EAG
Neil Peters, ARM
Barbara Brown, MDE
Jennifer Sohns, MDE
Luis Pizarro, EPA R3 LCD
Ruth Prince, EPA R3
Joel Hennessy, EPA E3