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August 4, 2022

JIM SMITH
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HOUSTON TX 77079

Subject: Technical Assistance Meeting Summary
Amoco Oil Terminal; BRRTS #02-16-000331
Amoco Barge Dock- Manifold & AST Area; BRRTS #02-16-117873
Amoco Oil Barge Dock- OW Separator & Loading Rack; BRRTS #02-16-297979
Winter & Maryland Streets, Superior, Wisconsin

Dear Mr. Smith:

This letter aims to summarize the discussions and outcome of a technical assistance meeting regarding the above-referenced sites located in Superior, Wisconsin.

On April 1, 2022, the Antea Group (Antea), on behalf of BP Products North America Inc. (BP), requested a technical assistance meeting with the Wisconsin Department of Natural Resources (DNR). The DNR received fees for providing assistance under Wisconsin Administrative Code § NR 749.04(1).

The meeting was held on July 6, 2022 in Eau Claire, Wisconsin. The following attended the meeting:

Jim Smith – BP (via telephone)
Wayne Hutchinson – Antea
Robert Karls – Antea
Layne Kortbien – Antea
Jonathan Zimdars – Antea
Judy Fassbender – DNR
Joseph Graham – DNR
John Hunt – DNR
Grant Neitzel – DNR
Chris Saari – DNR
Erin Endsley – DNR

The following is a summary of the significant subjects discussed during the meeting:

C. Reiss Property Redevelopment

The C. Reiss company proposes to redevelop its property on the north side of Winter Street into a bulk materials dock facility. Light non-aqueous phase liquids (LNAPL) petroleum and dissolved phase petroleum volatile organic compounds (PVOCs) from the Amoco Terminal site (02-16-000331) and the Amoco Barge Dock- Manifold/AST Area (02-16-117873) underlie the C. Reiss property. The redevelopment proposes substantial earthwork of over 140,000 cubic yards of sediment and soil, much of it contaminated. Placing this sediment and soil into a capped berm on the C. Reiss property is proposed. Due to this earthwork, it is proposed to have 26 wells associated with the Amoco sites be filled and sealed. This includes 21 wells used for groundwater monitoring and 5 remedial wells that are part of the Phase II LNAPL recovery system.

The DNR requested an additional round of groundwater sampling before abandonment of the wells. Antea has submitted a work plan for this work. The DNR maintains the position that all wells will have to be replaced unless Antea can justify to DNR's satisfaction that replacement wells are not needed in specific locations. Antea indicated they would provide a memo containing a plan for monitoring well replacement and justification for where well replacements will not be needed.

The decommissioning of the existing Phase II LNAPL recovery system at the Manifold/AST Site was discussed as part of the plans for the C. Reiss redevelopment project. Five of the six existing recovery wells are planned to be abandoned as part of the C. Reiss redevelopment. Antea indicated the system has been recovering less LNAPL each year, and the system is no longer efficient in recovery. The DNR explained they consider this recovery system as an interim measure and indicated the system could possibly be decommissioned. However, it may need to be replaced to complete a remedial action ultimately. The DNR again reminded Antea that once a Site Investigation Report (SIR) is approved for the Site, a Remedial Action Options Report (ROAR) would be required. The RAOR must present and evaluate remedial options that restore the environment in a reasonable amount of time as required by Wisconsin law. In the meantime, DNR recommends that Antea continue to evaluate and implement interim measures to recover LNAPL when and where practicable.

Contaminated Sediment Update

The DNR has entered a cooperative agreement with the Environmental Protection Agency (EPA) Great Lakes National Program Office (GLNPO) under the Great Lakes Legacy Act (GLLA). The GLLA is a non-regulatory program that leverages nonfederal contributions to obtain substantial federal funding and assistance to effectuate sediment cleanups. Under the agreement, DNR and GLNPO are cost-sharing the identification and evaluation of remedial action options to address contaminated sediments in multiple slips in the Wisconsin portion of the St. Louis River Area of Concern, including the Amoco Oil Barge Dock slip (the Slip). Sediments in the Slip are contaminated by volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), coal particles, and metals. DNR has retained a consultant to develop feasibility studies

and plans to solicit input from riparian property owners and the public on potential remedies in fall 2022 before remedy selection at year's end. The project's next phase will be to design and implement remedial actions for sediment with willing riparian owners and other partners under the GLLA by the end of 2024.

During the investigation of the Slip, an apparent piping outfall was observed along the west shore at the head of the Slip. Attached are DNR photographs of the pipe on July 2, 2020. The DNR noted that a report, *Underground Product Piping Removal Report*, dated February 2004 by Delta Environmental Consultants has a figure (Figure 4) displaying an effluent discharge pipe from the Amoco Oil/Water Separator site going north toward the Slip that was not fully removed. The DNR speculated the oil/water discharge pipe may be the pipe observed at the head of the Slip. Additionally noted are two ditches that lead from the oil/water separator area to the Slip. The piping and ditches may have been a conveyance for contamination found in the Slip sediment. The DNR indicated these conveyances require investigation on BP's part.

FedEx Expansion Project
Several acres of the former Terminal facility were sold around 2005 and developed as a FedEx distribution facility. In 2020 several more acres adjoining the FedEx facility were purchased in order to expand the FedEx parking lot area. This expansion project required the removal of 5 monitoring wells associated with the Terminal Site. The DNR is currently waiting for a revised construction documentation report before determining if replacing any of the removed wells will be required.

Recently Performed Work and Submittals

Temporary Wells
In a previous meeting with Antea/BP, the DNR pointed out delineation of contaminated groundwater was not defined fully on the eastern side of the Manifold Site (02-16-297979) and the Oil/Water Separator Site (02-16-117873). Four (4) temporary wells were installed and sampled in June 2020. Laboratory results from all 4 temporary well samples exceeded the Wisconsin Administrative Code ch. NR 140 Enforcement Standards for benzene. The DNR indicated that the groundwater conditions in this area were still not defined. Antea indicated they would put a response memo together regarding this issue.

Pipeline Removal
In September and October, 2020 Antea oversaw the removal of buried piping associated with the former Terminal Site. Approximately 2800 linear feet of pipe were removed in this work effort. Some piping underlying Winter Street and the BNSF rail tracks north of Winter Street were abandoned in place. Soil sampling was performed in pipe removal excavations; additionally, soil borings were performed in Winter Street. This work is summarized in Antea's report submitted to the DNR, Superior Terminal Pipeline Abandonment dated December 8, 2020.

Deep Benzene Plume
Antea submitted to the DNR the technical memorandum, *Analysis of Benzene Plumes and Assessment of Co-Mingling*, dated October 11, 2019. The DNR questioned to what extent the deep dissolved phase benzene plume originating at the Terminal Site might have contributions of benzene from the large LNAPL plume associated with the Manifold/AST Area Site. In that technical memorandum, Antea makes the argument and provides evidence that the Terminal LNAPL is the source of benzene for the deep benzene plume. The DNR concurs that the LNAPL at the Terminal Site is most likely the source of benzene in the dissolved phase plume.

During the meeting, Antea also presented information regarding the benzene concentration trends associated with the deep benzene plume. Antea's assessment concluded the benzene concentration trends are stable and/or decreasing. The DNR responded that several wells downgradient of the Terminal LNAPL source area have increasing benzene concentration trends and does not concur with the assessment as presented.

LNAPL Plumes
Antea submitted the technical memorandum Evidence of and Quantification of LNAPL Mass Depletion to the DNR, dated November 1, 2019. That document states a combined total of nearly 50,000 gallons of LNAPL remains in 13 areas at the 3 sites. The analysis used calculated ratios from LNAPL chemical analysis and compared the calculated site LNAPL ratios to known ratios for 87 Octane gasoline. Antea focused on LNAPL plumes 1 and 2 associated with the Terminal Site in the meeting. As previously noted, Antea believes the LNAPL plumes at the Terminal Site are the source of the deep, dissolved phase benzene plume. Antea indicated waterwashing (dissolution) of the LNAPL is the mechanism for the dissolved phase benzene contamination. The DNR concurs with this hypothesis, as waterwashing (dissolution) is the most likely cause of a deep dissolved phase benzene plume nearly ½ mile long moving toward St. Louis Bay with a footprint of more than 10 acres. The analysis also indicated that the process of evaporation has contributed to a reduction of the LNAPL source and that degradation is not contributing to LNAPL depletion at any of the LNAPL source areas evaluated. During the meeting, Antea presented information illustrating that Site LNAPL source areas include a mixture of gasoline, diesel, kerosene, and other fuel types in various stages of weathering. Given the varied LNAPL sources, it may not be appropriate to draw a conclusion regarding the relative degree of dissolution, evaporation, and degradation of LNAPL source areas compared to ratios based on 87 octane gasoline. Additionally, the amount of data available in this analysis is not spatially or temporally adequate to draw broad conclusions about the degree of LNAPL depletion attributable to those processes.

The LNAPL quantification was a topic of discussion during the meeting. The DNR recognizes much of the cone penetration test (CPT), laser-induced fluorescence (LIF), and data used to quantify the LNAPL volumes is up to 20 years old. The DNR suggested that efforts to obtain a current volume of LNAPL are appropriate. Antea did not agree with that assessment. The DNR reminded Antea that an accurate assessment of current LNAPL volumes may be required for

approval of a SIR and will be required if a closure request is made with LNAPL remaining in place.

Closing

Antea indicated they would submit technical memoranda in late July/August connected with the following issues:

- Well removal associated with the C. Reiss redevelopment project.
- Definition of degree and extent of groundwater on the eastern side of the Oil/water Separator Site and the Manifold/AST area Site.

The DNR recognizes the great amount of investigative work and interim remedial actions conducted at the Sites. However, the DNR also acknowledges the extreme nature of the degree and extent of contamination to soil and groundwater at the Site and the need for remedial actions. The DNR believes these 3 sites currently have the most LNAPL in the State of Wisconsin.

The DNR reminds BP that they are the "responsible party" under Wis. Admin. Code § NR 700.03(51) and must follow applicable law to address the discharge of a hazardous substance to the environment or other environmental pollution. Wisconsin Statutes ("Wis. Stats.") ch. 292 and Wis. Admin. Code chs. NR 700 through NR 754 provide specific requirements for appropriate response actions to address contamination, including emergency and interim actions, public information, site investigations, remedy selection, design, and operation of remedial action systems, and case closure.

The DNR has previously raised concerns of the lengthy time period these projects have taken. The first milestone of an approved SIR has not been accomplished to date after up to 35 years of investigation. The DNR stresses that BP should be more aggressive with the efforts to restore the environment in a reasonable amount of time as required by state statute and administrative code.

If you have any questions, please contact me at (715) 701-9383, by writing to the address at the top of this letter or by email to johnt.hunt@wisconsin.gov .

Sincerely,

John T. Hunt
Hydrogeologist - Remediation & Redevelopment Program
Northern Region

Attachment: Slip Photos

CC: Jonathan Zimdars (Antea jonathan.zimdars@anteagroup.com)

Pipe (possible outfall) next to concrete at the head of the Amoco Barge Slip, Superior Wi. Viewing south. Taken July 2, 2022, by Joe Graham.

Pipe (possible outfall) next to concrete at the head of the Amoco Barge Slip, Superior Wi. Viewing south. Taken July 2, 2022, by Joe Graham.