



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Four Penn Center
1600 John F. Kennedy Boulevard
Philadelphia, Pennsylvania 19103-2852

October 4, 2022

Mrs. Tiffani Doerr
Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

Subject: Ecological Risk Assessment: Areas of Interest 1 through 9

Dear Mrs. Doerr:

The U.S. Environmental Protection Agency (EPA) has received and reviewed the Ecological Risk Assessment: Areas of Interest 1 through 9 Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC Philadelphia Pennsylvania, 19145 prepared by Stantec Consulting Services, Inc. submitted June 30, 2022. The following items identify ecological risk assessment (ERA) gaps that are inconsistent with EPA guidance and practice (*Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments - Interim Final, June 1997*).

1. Ecological Receptors

Section 3.0 (Potential Ecological Receptors) of the ERA states that, according to certain PA Codes, potential ecological receptors only include individuals of threatened or endangered species as designated under the Endangered Species Act, exceptional value wetlands, habitats of concern, and species of concern. Due to these restrictions, this ERA only evaluated several avian species (including one with an extremely large home range), seven species of vegetation, and two sturgeon species (large ranges, limited residence in the Schuylkill), hickory shad, and eastern redbelly turtle.

All potentially impacted receptors are evaluated in an ERA to satisfy EPA guidance. AOIs 1 – 9 mostly border the Schuylkill River. Therefore, the primary habitat of concern is the river, and all of the river's potential ecological receptors are to be evaluated (benthic and water column species, likely avian and mammalian aquatic predators). The site also includes several on-site waterbodies which must be evaluated if remaining post redevelopment.

2. Lack of Relevant Data

The only data that was evaluated for this ERA consisted of six Schuylkill River sediment samples collected in the vicinity of AOIs 1 – 9, but these samples were collected for maintenance dredging purposes in existing shipping channels to evaluate dredge spoil quality for the Army Corps of Engineers. Shipping channels are not consistent aquatic habitat, and since they are routinely dredged, do not represent the non-dredged riverbed that provides habitat and may have received significant contamination from the Philadelphia Refinery.

3. Erroneous Conclusions

- a) The dredge maintenance sediment results were compared to 1993 Canadian sediment benchmarks. However, while the benchmark values were corrected for organic carbon content, the sediment results were not. If the sediment results had been correctly normalized for organic carbon content, they would all have exceeded the benchmarks. Section 5.1 erroneously concluded that the sediment results were below the benchmarks. In addition, these 1993 sediment benchmarks are quite dated. Particularly for PAH benthic effects, the narcosis-based equilibrium partitioning sediment benchmarks (ESBs) from the EPA *Developing Sediment Remediation Goals at Superfund Sites Based on Pore Water for the Protection of Benthic Organisms from Direct Toxicity to Non-ionic Organic Contaminants 2017* guidance should be used, but only for sediment results obtained from undisturbed sediment from the Schuylkill River sediment bed.
- b) Regarding the three fish species evaluated in the Stantec ERA, Section 6.0 repeatedly concludes that “However, fish can rapidly metabolize PAHs and readily eliminate their metabolites. . . Therefore, substantial ecological impacts to Atlantic sturgeon from exposure to PAHs in surface water and sediment in the Schuylkill River are not expected.” The author(s) of these statements apparently are unfamiliar with a large body of research showing that it is exactly the metabolism induced by PAH exposure that leads to a wide variety of toxicity in exposed fish, such as DNA adducts, liver lesions and tumorigenesis, and toxic impacts on fish growth and reproduction, as well as toxicity to fish embryos.

In conclusion, lack of data and complete ecological evaluations, as well as erroneous conclusions, results in an incomplete ERA in accordance with EPA guidance. A work plan to address gaps to satisfy EPA guidance should be submitted. The work plan should contain a detailed sampling plan for the Schuylkill River. Sampling should also be conducted for any on-site waterbodies that will remain post redevelopment.

If you have any questions or concerns, please contact me at 215-814-2796 or bilash.kevin@epa.gov upon receipt and review of this letter.

Sincerely,

Kevin Bilash
Land, Chemicals & Redevelopment Division
US Environmental Protection Agency, Region III

cc: L. Strobridge, PADEP
file

