



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Twin Cities Field Office  
4101 American Blvd E.  
Bloomington, Minnesota 55425-1665

OCT 16 2007

Pamela Blakely, Chief  
Air Permits Section  
U.S. Environmental Protection Agency  
77 West Jackson Blvd.  
Chicago, IL 60604-3590

Dear Ms. Blakely:

This is in response to your letter, received September 20, 2007, in which the Environmental Protection Agency (EPA) requested concurrence with the determination that the proposed issuance of a Prevention of Significant Deterioration (PSD) permit to Flint Hills Resources, Pine Bend Refinery (FHR) near Hastings, Minnesota, may affect, but is not likely to adversely affect Higgins eye (*Lampsilis higginsii*), a federally endangered mussel.

EPA and FHR conducted a screening-level risk analysis to assess the potential impacts of potential fugitive air emissions (i.e., those that leak as vapor from piping) from the proposed project. EPA anticipated that the majority of pollutants in the fugitive stack emissions would deposit from ambient air within three kilometers – Higgins eye may be present in the portion of the Mississippi River within that area. EPA's assessment of the potential impacts to Higgins eye are based largely on an April 19, 2007, document prepared by FHR "Endangered Species Impacts Assessment, Flint Hills Resources, LP - Pine Bend Refinery, In Support of EPA Review of #3 Coker Drum Replacement Project" and an Addendum to that document dated July 2007.

FHR identified the following chemicals to be released as fugitive emissions that have the potential to affect Higgins eye (i.e., chemicals of interest, COI) - benzene, biphenyl, ethylbenzene, hexane, naphthalene, polycyclic organic matter (POM), toluene and xylenes. There are no media-specific toxicity benchmarks for POM compounds as a group. Therefore, FHR selected total polycyclic aromatic hydrocarbons (PAHs) as a surrogate to represent all POM compounds "because PAHs are a major part of POM and toxicity benchmarks are available." FHR modeled POM deposition using the particle-deposition setting in AERMOD<sup>1</sup> because it expects POM to be quickly converted to a

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<sup>1</sup> A steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. Environmental Protection Agency. 2007 Jun 29. Technology Transfer Network Support Center for Regulatory Atmospheric Modeling.

<[http://www.epa.gov/scram001/dispersion\\_prefrec.htm](http://www.epa.gov/scram001/dispersion_prefrec.htm)>. Accessed 2007 Sep 12. AERMOD includes physicochemical parameters for each chemical modeled, including diffusivity in water.

particle-bound phase after being emitted as vapor (FHR 2007:10). The COIs may affect Higgins eye if they contact them in the water or in sediment inhabited by the species in the Mississippi River.

For each COI, FHR used AERMOD to estimate ambient air concentrations and deposition to water and sediments. They estimated the average annual concentration for each COI and used the maximum value of those five years in the risk analysis to help ensure that emissions were not underestimated. In addition, FHR (2007, p. 17) assumed a deposition velocity of 0.005 for the volatile fraction of the COIs and assumed that 100 percent of the fraction in the water would settle to the sediments although “the physical properties of the volatile COIs would indicate little or no direct deposition.” To avoid underestimating concentrations in surface water, FHR modeled those concentrations for low flow conditions (FHR 2007, p. 17).

FHR compared the media-specific concentrations (soil, sediment, water) for each COI to the most conservative and applicable toxicity reference value (TRV) available for that media. TRVs represent a no observed adverse effect level for each COI (FHR 2007:20). FHR preferentially selected TRVs for sediments on the most bioavailable form of each COI and used the most sensitive (lowest) TRV from among 22 and 24 screening benchmarks for water and sediment, respectively. If the estimated environmental concentration (EEC) for any COI was less than the TRV<sup>2</sup>, FHR concluded that the specific chemical was not likely to cause an adverse impact on “ecological receptors” at the modeled concentration. In the modeling performed for soil, surface water, and sediment exposure pathways, all chemical specific ESQs were less than one. FHR found no ESQs higher than 0.0003 or 0.000000003 for surface water and sediment, respectively.

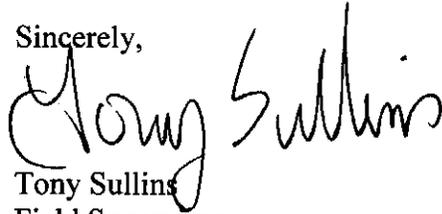
FHR also compared modeled deposition of COIs to background concentrations for the action area, although background concentration data were either imprecise or absent for most COIs (FHR 2007, p. 29). The measured values for the concentration of benzene in the water column and for naphthalene in sediments equal or approaches the relevant TRVs (background concentration/TRV: benzene (0.02/0.02); naphthalene (0.036/0.03). The modeled depositions of these two COIs, however, were 4-8 levels of magnitude less than the measured values.

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<sup>2</sup> The relationship of the EEC to the TRV (calculated as simply EEC/TRV) is known as the Ecological Screening Quotient (ESQ).

Based on the results of the analyses summarized above, we concur with EPA's determination that this action may affect, but is not likely to adversely affect Higgins eye. For further information regarding this consultation, please contact Phil Delphey at (612) 725-3548 ext. 206.

Sincerely,

A handwritten signature in black ink that reads "Tony Sullins". The signature is written in a cursive, flowing style.

Tony Sullins  
Field Supervisor