STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
LANSING

GRETCHEN WHITMER
GOVERNOR

LIESL EICHLER CLARK
DIRECTOR

October 26, 2022

VIA EMAIL

Michael Beedle, Supervisor
United States Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, Illinois, 60604

Dear Michael Beedle:

Subject: Implementation of a Mixing Zone Reauthorization Request; RACER Saginaw Nodular Industrial Land; Saginaw, Michigan; MID 041 793 340; Waste Data System Number 355505

The Michigan Department of Environment, Great Lakes, and Energy (EGLE), Materials Management Division (MMD), has reviewed the request for a Mixing Zone Determination for venting groundwater to the Saginaw River from RACER Saginaw Nodular Industrial Land, in Saginaw County, Michigan and forwarded that request to the Water Resources Division (WRD), EGLE. The response WRD provided identifies the acceptable concentration limits for discharge of the various chemicals characterized in the mixing zone request to the Saginaw River.

The following recommendations are based on the information the WRD provided:

1) The predicted worst-case maximum groundwater/surface water interface (GSI) discharge concentrations for pH are 6.56 Standard Units (S.U.) as a low (MW-03945), and 12.25 S.U. as a high (MW-05036). To ensure the Saginaw River is meeting Michigan Water Quality Standards for pH, we recommend a **daily minimum pH limit of 6.5 S.U. and a daily maximum pH limit of 9.0 S.U.**

2) The venting ammonia from the site was evaluated to determine if there is a concern for chronic ammonia toxicity. EGLE adopted new criteria for ammonia toxicity in 2019; those updated criteria are applied here. The new ammonia toxicity criteria still result in tighter limits at higher temperatures and pH; however, the new criteria are based on total ammonia instead of the calculated un-ionized ammonia fraction. Limits at the groundwater-surface water interface (GSI) were calculated using a total venting groundwater flow of 2.54 cubic feet per second. The lowest monthly 95th percentile exceedance flow in the Saginaw River is 570 cfs, based on Low Flow Discharge Request Record 10044. There is significant dilution available to the venting groundwater into the Saginaw River. At critical conditions in the summer season the venting groundwater represents less than 0.5% of the total flow in the Saginaw River.

There are locations with high ammonia concentrations in the monitoring wells on the site. The highest ammonia concentrations measured was 51 mg/l at MW-04836, with two additional readings at this well greater than 30 mg/l. The groundwater pH was generally low at this site, which lowers the risk of toxicity. Ammonia concentrations of 10-21 mg/l measured at MW-8, and MW-8R, coincide with higher levels of pH.

The ammonia concentrations are lower at the monitoring wells closer to the GSI. This implies that some nitrification is occurring in the groundwater as it moved toward the river. Concentrations at these wells is typically 10 mg/l or less. **The calculated ammonia toxicity limit at the GSI to prevent chronic toxicity in the summer season is 79 mg/l**, due to the high level of dilution available in the Saginaw River. None of the monitoring well samples exceed this concentration.

In order to demonstrate compliance with the mixing zone-based GSI criteria, RACER Saginaw Nodular Industrial Land must continue implementation of its mixing zone compliance monitoring program.

Should you have any questions regarding this letter or the Mixing Zone Determination, please contact me at ErberN@Michigan.gov; or 517-256-6063.

Sincerely,

Nathan R. Erber, PhD, Senior Geologist
Technical Support Unit
Hazardous Waste Section
Materials Management Division
517-256-6063

cc: Rich Conforti, MMD
Dale Bridgford, MMD
Mixing Zone File