SEWAGE-LIKE ODORS FROM MANY MIND CREEK & THE WATERFRONT

Below is a reprint of parts of a Monmouth County Health Department Report (with permission) describing sewage-like odors that originate from Many Mind Creek and the waterfront. Also on our website is an article from the Atlantic Highlands Borough Newsletter, The Beacon, about sewage-like odors.

For additional information, the complete Monmouth County Health Department Report, Natural And Cultural Features Of Monmouth County, *Background Reading for Environmental Health Investigations,* Revision 6/16/2009, can be accessed at: http://co.monmouth.nj.us/documents%5C121%5Cnaturalfeatures.pdf

(Reprint of selected parts pertinent to Creek & waterfront odors)

Sulfur is found in aquatic systems and groundwater in its oxygenated form, sulfate, or its anaerobic form, sulfide; since hydrogen sulfide is black and smells like rotten eggs, it is often mistaken for sewage. In fresh water sediments, the production of hydrogen sulfide can be determined by the amount of sulfate present when free-iron concentrations have already been precipitated out of solution as iron sulfide (Lomans et al., 1997).

In Many Mind Creek in Atlantic Highlands, this problem is exacerbated when tidal debris blocks the mouth of the stream, causing the flow to back up, pond, and turn anoxic; the original Lenape name for this creek was Cuppanickinn, which means "obstructed stream" (Boyd, 2004). Decaying sea lettuce can build up in sheltered coves to such an extent that the hydrogen sulfide gas can blacken nearby houses painted with lead paint when it forms lead sulfide (MacKenzie, 2005).

(Reprint of the complete text of the pertinent section of IRON AND SULFUR, page 23)

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These oxygen stressors make tidal interfaces in estuaries vulnerable to the effects of sulfur. For example, iron sulfate contributes to some tidal streams in the Bayshore and the Navesink and Shrewsbury Rivers turning black and smelling like sewage when sulfate is reduced to hydrogen sulfide. This happens when the dissolved oxygen in the water is overwhelmed as sulfur bacteria consume decaying sea lettuce (Ulva species) on the incoming tide during warm dry summers (Frankenstein, 2000; Olapade et al, 2006; Stahl et al., 1984). As sea lettuce grows, it layers into closely packed mats where water flow slows or stops; the layers closest to the bottom begin to die, mix with the sediment, turn black and produce hydrogen sulfide gas (MacKenzie, 2005). This also happens along the shoreline of Lake Michigan on decaying Cladaphora mats (Frankenstein, 2000; Olapade et al, 2006; Stahl et al., 1984). In Many Mind Creek in Atlantic Highlands, this problem is exacerbated when tidal debris blocks the mouth of the stream, causing the flow to back up, pond, and turn anoxic; the original Lenape name for this creek was Cuppanickinn, which means "obstructed stream" (Boyd, 2004). Decaying sea lettuce can build up in sheltered coves to such an extent that the hydrogen sulfide gas can blacken nearby houses painted with lead paint when it forms lead sulfide (MacKenzie, 2005). Two consecutive removals of these mats from the shoreline along the Navesink River reduced the thickness of the mat and maintained the area nearly free of it (MacKenzie, 2005). The Shark River also is known for its shoreline mats of sea lettuce, and Musquash Brook in the Shark River Watershed supports visible growths of white filamentous sulfur bacteria (Beggonia species).

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