



UPEA was retained to obtain the necessary permits for the construction of a Wal-Mart Super Center in the City of Houghton. Wal-Mart expanded the footprint of the existing store, as well as the associated parking area. This expansion necessitated relocating 1,400 ft of a nearby stream, and filling 5.5 acres of forested wetlands on the property, which was identified and delineated by UPEA personnel.

The State of Michigan requires restoration or creation of 2 acres of mitigation for every 1 acre of impact on forested wetland types. UPEA's mitigation plan consisted of restoring a wetland within the watershed of the nearby stream, as well as creating riparian wetland along 1,620 ft of new stream channel. The wetland restoration area had been previously degraded due to low water levels and copper mining activities, which left a significant amount of stamp sand in the area. This degradation left the wetland nearly a mono-culture of common cattail.

The mitigation plan called for varying the topography to create different wetland habitats, and reintroducing high quality, native wetland plant species to the area. Since stamp sand may be degrading water quality, UPEA proposed to remove much of the stamp sand, and cover any remaining stamp sand with a minimum of 6 inches of topsoil. Through this innovative approach, UPEA was able to negotiate a 10% reduction in the acres of mitigation required. This was a high profile project that has seen a great deal of public scrutiny. In addition, the scale of the project required the permit application to be reviewed by EPA. UPEA worked closely with the Michigan DEQ and was able to obtain a permit for the proposed activities.

Delta Solid Waste Management Authority Leachate Pretreatment Pilot Plant

PROJECT COST: \$50,000

LOCATION: Escanaba, Michigan

UPEA has assisted in the design, construction and operation of a pilot plant. The plant was designed to remove a large portion of the organic and inorganic concentrations in the leachate prior to pumping the leachate to the City of Escanaba Wastewater Treatment Plant for final treatment. Data collected from the pilot plant was used to design a full scale plant.



Pilot Plant

Delta Environmental Consultants Amoco Bulk Terminal

PROJECT COST: \$120,000

LOCATION: Escanaba, Michigan

UPEA operated a remedial system at the Amoco Bulk Terminal in Escanaba. There was a free-product removal system and a groundwater purging system utilizing carbon filtration. Our technicians and engineers were on call at all times providing maintenance and monitoring two to three times per week when temperatures were above freezing and daily during freezing conditions.



**Subsurface Exploration to Determine
Geological & Groundwater Conditions**

Delta Environmental Consultants Carnes Amoco Station

PROJECT COST: \$39,000

LOCATION: Escanaba, Michigan

This project involved the operation and maintenance of a groundwater collection and treatment system at a high volume gas station in Escanaba, Michigan. Our staff operated and maintained this system including weekly and occasionally daily activities concerning the activated carbon treatment and pumping system. Other activities at this site included periodic groundwater quality sampling, carbon changes, and routine performance monitoring of the system.