



**Eco Project Title:** “Impact of Dispersion of Waste Materials at an Old Oil Production Site”

**Principal Investigator:** Don Kampbell, (USEPA/ORD/NRMRL/GWERD, Ada, OK 580-436-8564)

**Collaborators:** U.S. Geological Survey, Army Corps of Engineers, Bureau of Indian Affairs

**Introduction:** Two old oil production sites adjacent to a watershed reservoir have been impacted by releases of crude oil and produced brine water as a result of equipment failures and other disposal methods. These releases and the ecosystem restoration of affected areas are national issues that concern watershed managers as well as regulators, surface landowners and local residents.

**Background:** The sites are located adjacent to Skiatook Lake, northwest of Tulsa, Oklahoma. The sites have a long history of petroleum production with the highest activity occurring in the 1930's.

**Objective:** The first goal of the project is to conduct a site assessment study to characterize the extent of damage to the surface, subsurface, ground water and adjacent lake sediments. The second goal is to determine by test plots survival of introduced grasses and woody plants in impacted areas. The overall goal is to stabilize salt and oil scarred landscapes to an acceptable ecologically restored condition. Introduced plants with a good survival rate are expected to be established on a field scale possibility in 2004. The studies will serve as a model for future assessments to support ecosystem restoration decisions regarding watershed management in areas where oil and brine wastes are having an impact by rainwater erosion and movement of contaminants into a lake.

**Approach:** The extent of landscape scarring by photography, the observed introduced and native plant survival, and soil chemical contamination are being characterized for the purpose of restoration options for these types of sites. Introduced Black Locust and Russian Olive seedling trees and Bermudagrass are being evaluated for suitability for restoration.

**Accomplishments:** Site characterization studies were completed in 2002 for surface soils as related to soil salt, pH, nitrates, petroleum hydrocarbons, organic matter, and dehydrogenase activity. Nearby shore sediments have been analyzed for metals with RCRA toxic quantities of arsenic, barium-cadmium, chromium and lead present. Survival rate of seedling trees has been 90 percent for the Black Locust and 20 percent for the Russian Olive for the test plots in 2003. Papers on the study results have been presented at both the 2002 and the 2003 International Petroleum Environmental Conferences.

**Anticipated future tasks:** Establish Black Locust seedlings on all impacted areas at both field sites. Publish results of studies in a final technical report in collaboration with the U.S. Geological Survey.