Case Study (OP1)
Problem - Diesel and Oil Contaminated Soil.

Oppenheimer Biotechnology Inc.

Goals

- ✓ Reduction of TPH and BTEX/MTBE levels in the soil.
- ✓ To clean the soil per State of Texas standards
  TPH - less than 50ppm
  BTEX/MTBE - non detect
- ✓ Complete project within 90 days

Site Location and Description – Military Air Station in South Texas
Approximately 1,500 m^3 of soil contaminated by a mixture of diesel fuel and oil. The soil was excavated and moved to a lined treatment pad.

Contaminants Treated - diesel fuel and oil

Geology - Caliche and Sandy Soil

Starting Levels – TPH levels ranged from 3,500 to 8,000 ppm. A sample composite was prepared by collecting 30 samples from randomly selected points.

Cleanup Standards – per the State of Texas (TCEQ)

TPH (total petroleum hydrocarbons)	- less than 50 ppm.
BTEX (benzene, toluene, ethylbenzene, and xylenes)	- non detect
MTBE (methyl tertiary-butyl ether)	- non detect

Treatment Method - in situ
The soil spread evenly over a 170 x 30 meter area on a black plastic liner. The product was applied to the soil. The soil was watered and tilled.

The site was tilled two more times over a 6 week treatment period and watered, as per recommendations to promote rapid biodegradation of the hydrocarbons present in the soil.

Oppenheimer Products used

❖ **Piranha**

Project Results

After sixty days samples were collected and analyzed. There were no reportable levels of either TPH or BTEX/MTBE found by either third party laboratory in any of the samples submitted for analysis. While the reporting limits for the two laboratories varied slightly, both laboratories reported TPH at or below 50 mg/Kg and BTEX/MTBE – non detect.

This met the initial criteria set by the project manager and The State of Texas (TCEQ). The project was deemed to have been successfully completed, and no further treatment of the soil was recommended.

Actual Time Frame – 60 days

Third party testing standards used - TCEQ method TX1005 for TPH analysis. USEPA method 8260 or USEPA method 8021B for BTEX/MTBE (benzene, toluene, ethylbenzene, xylenes and methyl t-butyl ether)

Results Achieved

- ✓ **99.9% reduction** of diesel fuel and oil in the soil.
- ✓ **Achieved** State of Texas cleanup levels
  TPH - less than 50ppm
  BTEX/MTBE - non detect
- ✓ **Finished 30% ahead** of schedule.
- ✓ **Eliminated** cradle to grave liability.