

EPA Testing Bioremediation Programs

Several innovative and successful bioremediation programs have been conducted using the ACT strain of microorganisms, in conjunction with various environmental engineering firms and remediation contracts.

Case #1: Bioremediation was selected as the method of choice to clean up an abandoned refinery site in southern California. The thirty-two acre site was located in a prime industrial area and the goal was to clean the site to a low enough level that commercial building could be built.

The initial contaminated levels for the site ranged from a low of **1500 ppm** to a high of **30,000ppm**. The site was sectioned off into several treatment zones, and a bioremediation program was begun using a consortia of microorganisms supplied by ACT. Since the site had been contaminated on and off for period of forty years with little or no sign of decontamination by indigenous organisms it was concluded that a bioaugmentation program could accelerate the remediation process.

The treatment was conducted over a period of six months. While the area was being treated other areas were being taken out of service until the entire tank farm was dismantled. As areas were taken out of service treatment was begun to remediate those sections of the property. The twenty-nine areas of the area were certified as clean within a period of one year. The balance, which has been used as the dumping area, **is still being remediated.**

Case #2: The city of Carson, California decided to exercise its redevelopment powers and condemned a site that had been used as a petrochemical tank storage site and salvage operation. The site had been an eyesore. Rather than seal the contaminants at the site under building and parking lot, the city decided to get rid of the contaminants. The site had been earmarked as a park, and the city officials were concerned that if the contaminants were left in place they may endanger the health of the children using the park (13).

The price for hauling away the contaminated soil for proper disposal was estimated to be **\$2 million**. The estimated amount of contaminated soil was approximately 10,000 cubic yards. A bioaugmentation program was proposed and adopted at the site.

The cost of the clean up was less than **\$132,000**, and the city began bids for its most elaborate recreation facility.

Case #3: When the Sacramento Utilities District purchased a small parcel of land to expand their existing park lot, they were unaware that the land had been previously contaminated with diesel fuel. Once the contamination had been detected the Utilities District decided to take it upon themselves to clean up the site.

The District realized that merely excavating and hauling the contaminated soil to a dumpsite was just transferring the problem to another site. In keeping with the Districts policy of concern with the environment, other alternatives to land disposal were sought.

Upon examination of treatment options the District decided to implement a bioremediation program using bioaugmentation as the source of organisms. The bioremediation of the 2000 cubic yards of contaminated soil reduced the Total Petroleum Hydrocarbon levels from **2800 ppm** to less than **38 ppm** in approximately **74 treatment days (11)**. The cost of treatment was **\$360,000** less than the total price of disposal without the inherent liability.

Case #4: Bioremediation was the method of treatment opted to treat 1500 cubic yards of diesel contaminated soil at the former Kings Truck Stop in Sacramento, California. The project reduced the diesel contaminated levels from **3000 ppm** to less than **30 ppm** in approximately **62 treatment days**

Case #5: Insitu bioremediation was necessary to clean up contamination from a ruptured transfer line that passed under a railroad track. A jumbo tank car had been moving on the track as solvents were being pumped through the line. The resulting rupture led to a loss of 300 to 400 gallons of solvent at a depth of 38 inches beneath the surface along 120 feet of the track.

A continuously recirculating ground injection system was designed and installed to treat the contaminated soil. Following a cleanup program of nine months with the bioaugmentation system, 99.5% degradation of the contaminants was achieved (Table 1).

Case #6: A bioremediation project involving 32,000 cubic yards of soil contaminated with various lubrication and form oils is currently ongoing. Preliminary results indicate that the contamination levels have been reduced from a high **4800 ppm** down to **125 ppm** in the most contaminated cell. In a lesser-contaminated cell the levels have been taken from **1400 ppm** down to below the action level of **100 ppm**.