

## Bioremediation of Excavated Petroleum Contaminated Soil

### Introduction

The Department of Environmental Quality (DEQ) provides this information to facilitate approval of work plans for one-time biotreatment of petroleum-contaminated soils using conventional land farming techniques. Bioremediation will only be approved when appropriate controls are in place to protect the underlying soil, groundwater and ambient air.

### Economics

The cost of hauling and disposing of contaminated soils are often less than building and maintaining an adequate treatment cell. If biotreatment is chosen as the cleanup alternative, it must be actively managed with appropriate and timely aeration and watering as well as additional amendments such as fertilizer or microbes. The default cleanup goal for total petroleum hydrocarbon (TPH) contaminated soils is 50 mg/kg or less. Concentrations higher than 50 mg/kg may be approved on a case-by-case basis depending on the proposed level and use of the soils after remediation. Additional sampling for other analytes may be required. It is important to evaluate costs for different remedial options. Bioremediation is not a passive treatment – it requires capital as well as operational and on-going analytical costs. DEQ encourages careful comparison of biotreatment costs to conventional landfill disposal costs. Disposal in a landfill is often more economical, depending upon the volume of soil and the level of contamination.

### Consent Order

It is unlawful for any person to cause pollution of the waters of the state or to place or cause any waste to be placed in a location where they are likely to cause pollution of any air, land, or waters of the state. Any such action is a public nuisance. If DEQ determines there is such pollution, an order can be issued requiring such manner of treatment or disposition of the polluting material as may be necessary to prevent further pollution. For voluntary cleanup activities of petroleum-contaminated soils, the remediator can enter into a consent order, which contains the terms of the remediation.

A consent order will require submittal of a work plan to DEQ for approval. The work plan sets forth design, construction and operational standards. Failure to follow an approved work plan could be a violation of the order and subject to enforcement actions under the Environmental Quality Code (see 27A O.S. § 2-6-105 and §§ 2-3-502 through 2-3-506) and the Oklahoma Hazard Waste Management Act (see 27A O.S. §§ 2-7-126 through 2-7-130).

