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LAND FARMING OPTION For the Deepwater Horizon Oil Spill Waste July 6, 2010

The purpose of this document is to provide a general overview of land farming techniques and handling options for solid oily waste and debris associated with the Deepwater Horizon oil spill. While this oily waste and debris is expected to be "wet," this document is not intended to address oily wastewater generated from skimming, decontamination and cleaning operations.

What is land farming? Typical land farming of gasoline and diesel soaked soil involves the process of spreading out the soil onto a lined impervious surface in thin layers of no more than 12 inches in thickness. The soaked soil is allowed to bake in the sun and the gas or diesel byproducts (constituents) evaporate, biodegrade and photodegrade. As these natural processes occur, the soil is turned or tilled to allow for continued exposure to the air. Additional microorganisms or other additives may be added to speed up the degradation process. Soil samples are taken and analyzed by a lab to monitor levels of constituents in the soil during the evaporation process. Once the soil degrades to a certain point it can be sent to a soil thermal treatment facility for further treatment. Provided the waste does not fail a TCLP test and is not a liquid waste, it can either be disposed of or used as initial or intermediate cover at a permitted lined Class I landfill. In some cases, sufficiently thermally treated soil may be beneficially used for purposes such as road beds and fill.

How is this different from evaporation? Evaporation is simply a drying process rather than a degradation process. Allowing the water to evaporate from contaminated material reduces its volume and makes it easier to handle before disposal.

Is land farming a viable treatment option for oily waste and debris from the Deepwater Horizon oil spill? Land farming would be an option for unsaturated oil-contaminated material such as debris, soil, sand, and vegetation collected from the shoreline (such as seaweed), including tar balls and tar mats. However, depending on the amount of weathering of the oily debris, some material may actually be toxic to microorganisms and would likely require dilution with cleaner soils or the addition of additives to make the treatment effective. Even simple evaporation would be a useful initial treatment for this type of material.

How would such a facility be constructed? There are rules for the construction of soil treatment facilities including land farming facilities. However due to the emergency nature of

the situation many of these requirements would need to be waived or clarified in the Department's Emergency Final Order (EFO) for the spill. One of the bigger issues would be the control and containment of stormwater runoff from the treatment areas. Engineering controls such as soil berms and lined holding ponds may be needed along the edges of the treatment area to direct the contaminated stormwater to lined holding ponds where it can be treated. In some instances stormwater collection may require sumps and pumps to move the stormwater to onsite containers for further treatment, recycling or disposal. To help minimize the generation of impacted stormwater, land farming operations should have an impervious cover (such as plastic sheeting) available to the extent practicable to place over the crude oil material during rainfall events to prevent stormwater contact with the contaminated soil.

What happens to the oily waste or debris after the land farming process? Since newly collected oily waste and debris would be arriving at the land farming facilities on a reoccurring basis, the onsite material would need to be cycled through the land farming process and disposed of in order to allow room for the treatment of new material. Ideally, the soil could be reused once full treatment has been achieved. However, this would involve separate sorting and screening operations if the desired outcome is to return beach sand to its original location. In the interest of time, the more preferred approach might be to secure on-site thermal treatment of the soils or transport the material off-site to a lined Class I landfill.

How long would the process take? The initial evaporation process would occur within a few days especially in the case of oil soaked seaweed. The degradation process for the chemicals in the crude oil product would take longer. How much time should be allowed for the total process will be determined by the ultimate disposition of the material. Beneficial use of the material, which would generally require more treatment, would take longer than disposal or use at Class I landfills. If additives are applied to accelerate the degradation process, the timeline may be shorter. If a portable thermal treatment facility is staged at the land farming facility, the operator will determine when it is appropriate to begin burning so that burn temperatures can be controlled.

What type of area would be appropriate for land farming? Ideally, the oily waste or debris would be transported to a facility that has some type of approved impervious surface (such as an aircraft runway) and which would not be located near a populated area because of potential odor issues associated with the land farming process. There are some airstrips in the panhandle on military reservations that could possibly be considered for land farming. Some of these facilities are in use and others appear to be minimally used or not in use. Other areas that would be appropriate for land farming include state or local government-owned sites or private tracts of agricultural land that could be improved to minimize stormwater runoff and groundwater contamination. If land farming is chosen as a means of treating and handling oily waste or debris from the Deepwater Horizon oil spill, Department staff would assist in finding the most appropriate site to stage such an operation.