GUIDELINES
FOR
SURFACE IMPOUNDMENT CLOSURE

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PREFACE

The following procedures shall be used as a guide for the closure of surface impoundments used for the containment of those wastes regulated by the Oil Conservation Division, individual districts may impose additional requirements. All plans and specifications shall be submitted to and approved by the Oil Conservation Division prior to closure. Procedures may deviate from the following guidelines if it can be shown that the proposed procedure will remove or isolate contaminants in such a manner that ground water, surface water and the environment are protected from future contamination.

If a number of impoundments are to be closed by a single company, one plan detailing the procedures to be followed at all locations may be submitted for approval. The plan must state the specific location of each impoundment that is to be closed under the procedures proposed in the plan.

Constituents and procedures for soil and ground water testing and remediation may vary depending on the site specific conditions.

INTRODUCTION

OCD Surface Impoundment Closure Guidelines are intended to provide guidance to operators and facility owners for closure of surface impoundments in a manner that assures protection of surface waters, ground waters and the environment.

PART 1 EXEMPT IMPOUNDMENTS

I. SITE ASSESSMENT

Prior to final closure of surface impoundments, the operator or facility owner will perform an investigation to determine the extent to which soils and/or ground water have been impacted by the operation of the impoundment using the following procedures:

A. Soil Contamination Assessment

1. Highly Contaminated Soils

Highly contaminated soils are defined as soils which are stained or saturated with any type of petroleum product. These soils can be distinguished by observing the physical properties of the soil for observable free phase petroleum product, gross staining and evidence of a very strong odor. These physical properties are criteria which may be used to determine if the soil is highly contaminated.

2. Other Contaminated Soils

Other contaminated soils are defined as those soils which do not exhibit highly contaminated characteristics as described in Part 1 I.A.1. above. The following field or laboratory procedures may be utilized to determine the degree of contamination:

a. Headspace Method

i. Fill a 0.5 liter or larger jar half full of sample.

ii. Seal top tightly with aluminum foil.

iii. Ensure sample is at 15 to 25 degrees Celsius or approximately 60 to 80 degrees Fahrenheit. A warm water bath should be used if necessary to raise sample temperature to an acceptable range.

iv. Aromatic hydrocarbon vapor concentrations must be allowed to develop in the headspace of the sample jar for 5 to 10 minutes. During this headspace development period, the sample jar should be shaken vigorously for 1

minute.

v. Pierce aluminum foil seal with the probe of either a PID or FID organic vapor analyzer, and then record the highest (peak) measurement. The instrument must be calibrated to assume a benzene response factor.

b. Laboratory Method

i. Sampling Procedure

1. Collect samples in clean air tight jars, preferably jars supplied by the laboratory which will conduct the analysis.

2. Cool and store samples on ice.

3. Promptly ship sample to the lab for analysis following chain of custody procedures as necessary,

ii. Analysis Methods

Below are the OCD required laboratory methods required for the analysis of contaminated soils. Alternate laboratory methods may be used for analyzing soils for contaminant concentrations, if approved in advance by the OCD.

1. Purgeable organic contaminants will be determined using EPA Method 8010 and EPA Method 8020.

2. Total Petroleum Hydrocarbons (TPH) will be determined using the modified EPA Method 8015.

B. Ground Water Contamination Assessment

The installation of monitor wells to determine the impact of the disposal of wastes to surface impoundments may be required depending on the results of the assessment of soil contamination at the site. If monitor wells are required, they are to be installed and sampled using the following guidelines:

1. Monitor Well Installation

a. Locations

One monitor well should be installed through the center of the impoundment or directly adjacent and downgradient of the impoundment to determine if ground water has been impacted by disposal activities. Additional monitor wells, upgradient and downgradient of the impoundment, to delineate the full extent of ground water contamination may be required if ground water directly underneath the pit has been found to be impacted by disposal activities.

b. Construction

Monitor wells construction materials shall be selected to be chemically resistant to the contaminants to be monitored and be able to be installed without the use of glues or adhesives.

Monitor wells shall be constructed according to accepted industry standards with a minimum of five feet of well screen above the water table to accommodate seasonal fluctuations in the static water table.

2. Ground Water Sampling

Ground water shall be sampled from monitor wells according to accepted industry standards. Samples shall be analyzed for potential contaminants contained in the wastes disposed of in the impoundment. All laboratory analyses will be conducted pursuant to standard EPA Methods unless OCD has approved the use of alternate laboratory methods.

II. Action Levels

A. Soils

The action levels listed below apply directly for sites where soils are to be remediated in place or removed for treatment on the surface.

1. Highly Contaminated Soils

a. Soils which are determined to be highly contaminated either by the observation of physical properties must be remediated.

2. Other Contaminated Soils

a. Field Headspace Method

A measurement of 100 parts per million (ppm) or greater of total organic vapor indicates that remedial action is necessary.

b. Laboratory Method

Remedial action is necessary if any of the following contaminant levels are exceeded:

i. The sum of the concentrations of all detected aromatics is greater than 50 ppm.

ii. The benzene concentration is greater than 10 ppm.

iii. The concentration of TPH is greater than 100 ppm.

B. Ground Water

Ground waters found to be contaminated from waste disposal at a surface impoundment with free phase products and dissolved phase constituents in excess of New Mexico Water Quality Control Commission (WQCC) water quality standards will be required to perform remedial actions.

III. REMEDIATION

A. Soils

When a contaminated soil requires remediation according to standards set forth in Part 1.II.A., it must be remediated according to the criteria described below.

1. Removal

a. Highly Contaminated Soils

Highly contaminated soils should be excavated from the ground to the maximum depth and horizontal extent practicable.

b. Other Contaminated Soils

Contaminated soil which exceeds the action levels set out in Part 1.II.A.2. must be excavated to the maximum depth and horizontal extent practicable until samples from the walls and bottom of the excavation pass the contaminant specific action level.

2. Disposal/Treatment

Below is a list of options to be used for either the treatment or disposal of contaminated soils.

a. Disposal

Excavated contaminated soils may be disposed of offsite at an OCD approved facility with prior OCD approval.

b. Treatment Of Excavated Soils

i. Thin Spreading

Soil must be spread in a single layer no greater than six inches thick in a bermed area. If the depth to the seasonal

high static water level is less than 100 feet, the soil must be placed in a level bermed area on an impermeable barrier such as hypalon or concrete. All necessary precautions must be taken to prevent runoff of contaminants or the infiltration of contaminants below the ground surface. The soil should be disced to enhance aerobic biodegradation approximately once every two weeks.

ii. Other Methods

The OCD encourages other methods of soil remediation, including but not limited to, active soil aeration, bioremediation and thermal treatment. Alternatives to thin spreading must be proposed to OCD for approval or disapproval prior to commencement of remediation activities. Soils which are temporarily stockpiled prior to treatment or disposal must be kept on an impermeable barrier in a bermed area to prevent runoff or infiltration of contaminants.

c. Residual Contamination

Where contaminated soils remain beyond the horizontal or vertical

extent of practicable excavation, they must be treated in place .In place treatment may be accomplished using vapor venting, bioremediation or some other treatment system. The method to be used must be approved in advance by the OCD and must be capable of reducing contaminant levels in a timely manner.

B. Ground Water

When contaminated ground water requires remediation according to standards set forth in Part 1.II.B., it must be remediated according to the criteria described below.

1. Free Phase Contamination

Free phase products must be removed from ground water. Floating product can be removed from ground water through the use of either skimming type devices or total fluid type pumps. The OCD does not endorse the use of any specific product for the removal of free phase products from ground water.

2. Dissolved Phase Contamination

Ground water contaminated with dissolved phase constituents in excess of WQCC water quality standards can be remediated by either removing and treating the ground water or insitu treatment. The OCD does not require the use of any specific technique or product to remediate contaminated ground water. If treated waters are to be disposed of onto or below the ground surface, a discharge plan must be submitted and approved by OCD.

IV. TERMINATION OF REMEDIAL ACTION

Remedial action may be terminated when the criteria described below have been met:

A. Soils

Soil contamination must be reduced to a concentration which will not contaminate ground water through percolation (aquifer recharge) or as the water table rises and falls with seasonal fluctuations. Analytical testing must be conducted on sites where the seasonal high static water table is 50 feet or less and the ground water contains 10,000 ppm or less of total dissolved solids(TDS). The appropriate,

contaminant specific procedure for soils testing must be conducted on representative samples of the remaining contaminated soils. The results of the analysis of these samples must conform to the standards specified in Part 1.II.A.2.. of the guidelines.

If the soil contaminant standards cannot practicably be attained, a risk assessment may be performed and provided to OCD for approval showing that the remaining contaminants will not pose a threat to beneficial use for the foreseeable future

B. Ground Water

A ground water remedial action may be terminated if all free phase product has been removed from the water and the concentration of dissolved phase contaminants in the ground water does not exceed New Mexico WQCC water quality standards.

If the water quality standards cannot practicably be attained, a risk assessment may be performed and provided to OCD for approval showing that the remaining contaminants will not pose a threat to beneficial use for the foreseeable future

V. Final Closure

Upon completion of any necessary remediation activities the impoundment shall be backfilled with clean materials and mounded to prevent ponding.