PIT

AND

BELOW-GRADE TANK

GUIDELINES

November 1, 2004

NEW MEXICO OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
SANTA FE, NEW MEXICO 87505

BEFORE THE OIL CONSERVATION DIVISION
Santa Fe, New Mexico
Case No. 14186 Exhibit No. 8
Submitted by:
McElvain Oil & Gas Properties, Inc.
Hearing Date: October 15, 2008

TABLE OF CONTENTS

INTRODUCTION

The following guidelines apply to pits and below-grade tanks used for the containment of exploration, production, processing and storage wastes regulated by the New Mexico Oil Conservation Division (OCD), and classified as 1) exempt from Federal Resource Conservation and Recovery Act (RCRA) Subtitle C Regulations, or 2) non-hazardous by characteristic testing. These guidelines replace the OCD's October 1991 "GUIDELINES FOR THE SELECTION AND INSTALLATION OF BELOW-GRADE PRODUCED WATER TANKS", February 1993 "UNLINED SURFACE IMPOUNDMENT CLOSURE GUIDELINES" and May 28, 2004 "INTERIM PIT AND BELOW-GRADE TANK GUIDELINES".

The intent of the guidelines is to outline the methods and specifications the OCD has approved for the design, construction, operation, maintenance and closure of pits and below-grade tanks in a manner that protects fresh waters, public health and the environment. To obtain a permit for a pit or below-grade tank or to close a pit or below-grade tank under 19.15.2.50 NMAC, an operator must either follow the guidelines or obtain the OCD's approval for an alternative method. To obtain approval for an alternate method, the operator must demonstrate that the alternative method will meet the requirements of 19.15.2.50 NMAC and statutory requirements to prevent contamination of fresh water, and protect public health and the environment.

Compliance with the guidelines, or receipt of a permit under 19.15.2.50 NMAC, does not relieve an operator of liability for any releases or contamination which may pose a threat to fresh waters, human health and the environment, or relieve an operator of responsibility for compliance with any other federal, state or local laws and regulations.

DEFINITIONS

A "pit" is defined as any surface or sub-surface impoundment, man-made or natural depression, or diked area on the surface. Excluded from this definition are berms constructed around tanks or other facilities solely for the purpose of safety and secondary containment. The term "pit" includes but is not limited to: produced water pits, dehydrator pits, blowdown pits, separator pits, tank drain pits, pipeline drip collector pits, compressor scrubber pits, flare pits, drilling pits, reserve pits, workover pits and all other pits which receive exploration, production and processing wastes regulated by OCD.

"Below-grade tanks" are defined as vessels, excluding sumps and pressurized pipeline drip tanks, where any portion of the sidewalls of the tank is below the surface of the ground and not visible.

"Soil" is defined as that earth material which has been so modified and acted upon by physical, chemical, and biological agents that it will support rooted plants.

"Sumps" are defined as any impermeable single wall vessel with a capacity less than 500 gallons, where any portion of the sidewalls of the reservoir is below the surface of the ground and not visible which vessel remains predominantly empty, serves as a drain or receptacle for spilled or leaked liquids on an intermittent basis, and is not used to store, treat, dispose of, or evaporate products or wastes.

The New Mexico State Engineer has designated fresh waters as all surface waters and ground waters of the state containing 10,000 milligrams per liter or less of total dissolved solids (TDS) for which there is

a present or reasonably foreseeable beneficial use. The term "reasonably foreseeable" is generally taken to mean a time period of not less than 200 years into the future, but could be thousands of years.

I. PERMITTING PROCEDURES

A. APPLICATION FOR PERMIT

After April 15, 2004, an operator must apply for a permit to construct or use any pit or below-grade tank on Form C-144, an application for permit to drill, or on the sundry notices and reports on wells, as appropriate. OCD approval of such form constitutes a permit for all pits and below-grade tanks annotated on the form. For pits and below-grade tanks in existence prior to April 15, 2004 that have not received an exemption after hearing as allowed by OCC Order R-3221 through R-3221D inclusive and that the operator proposes to continue to use, a permit application is required on, or prior to, September 30, 2004. If an operator intends to use the same procedures for construction of pits and below-grade tanks at multiple sites, the operator may submit one general plan. For subsequent pits or below-grade tanks constructed under the general plan, the operator must only notify OCD of the location of the pit or below-grade tank on Form C-144, an application for permit to drill, or on the sundry notices and reports on wells, as appropriate. Deviation from an approved general permit requires OCD notification and approval.

If any pit, berm or levee to be constructed is more than ten feet (10') in height from ground level, or if a pit volume is more than 10 acre-feet, the State Engineer Office must also review and issue a construction permit.

B. DEFINITIONS FOR USE IN FILING FORMS C-101, C-103, OR C-144

1. Depth to Groundwater is defined as the vertical distance from the lowermost water contaminants to the seasonal high water elevation of the ground water. If the exact depth to ground water is unknown, the ground water depth can be estimated using either local water well information, published regional ground water information, data on file with the New Mexico State Engineer Office or the vertical distance from adjacent ground water or surface water.

2. Distance to the Nearest Fresh Water Well is calculated as the horizontal distance to the nearest fresh water well or spring within 1000 feet of the site.

3. Distance to Nearest Surface Water Body is calculated as the horizontal distance to the nearest wetland, playa lake, sinkhole, or any lake bed, gully, draw, stream bed, wash, arroyo, natural or human-made channel through which water flows or has flowed within 1000 feet of the site.

C. CLOSURE PLANS

A pit or below-grade tank will be closed within six months after cessation of use. The division for good cause shown may grant a six-month extension of time to accomplish

closure. Prior to commencing closure of a storage, disposal, drilling, workover or emergency pit, or below-grade tank, a closure plan must be submitted to and approved by OCD. If a number of pits or below-grade tanks are to be closed by a single company, the company may submit one general plan stating the areas and types of facilities to be closed, along with the procedures to be used during closure. Deviations from approved plans require OCD notification and approval.

Prior to final closure, the operator of an unlined pit, or a pit or below-grade tank that has had a release into the environment will perform an assessment to evaluate the extent to which soils and/or ground water may have been impacted by its operation. Assessment results will form the basis of any required remediation. Sites at which there have been releases will be assessed for the severity of contamination and potential environmental and public health threats, and remediated in accordance with the OCD's August 13, 1993 "GUIDELINES FOR REMEDIATION OF LEAKS, SPILLS AND RELEASES".

At a minimum, a closure plan will include the following elements:

1. Procedures that will be used to assess the extent of contamination if the closure involves an unlined pit, or a pit or below-grade tank that has had a release into the environment.

2. Procedures to be used to manage, remediate, or dispose of all contaminated soil and wastes.

3. Schedules for submission of closure reports on each pit or below-grade tank.

D. CLOSURE REPORTS

Closure of pits and below-grade tanks must be reported on OCD Form C-144, or sundry notices and reports on wells accompanied by the information necessary to evaluate the closure. If a pit or below-grade tank closure report is made on sundry notices and reports on wells, the operator shall include the same information as would be filed with OCD Form C-144.

II. DESIGN AND CONSTRUCTION

A. GENERAL

1. Location

Pursuant to 19.15.2.50.C(2)(a), no pit shall be located in any watercourse, lakebed, sinkhole, or playa lake. Pits adjacent to any such watercourse or depression shall be located safely above the high-water level of such watercourse or depression. No pit shall be located in any wetland. The OCD may require additional protective measures for pits located in ground water sensitive areas or wellhead protection areas.

2. Stockpiling of Topsoil

Prior to constructing any pit, except a pit constructed in an emergency, wherever possible, topsoil must be stripped and stockpiled for use as the final cover of fill at the time of closure.

3. Exclusion of Runoff Water

A pit must be constructed and maintained so that runoff water from outside the location is not allowed to enter the pit. Berms surrounding the pit must be maintained.

4. Freeboard

Freeboard is the distance between the uppermost pit fluid level to the top of the pit berm. The designed freeboard allowance must take wave action into account to prevent overtopping due to wave action.

B. DRILLING AND WORKOVER PITS

Unless otherwise provided in 19.15.2.50 NMAC, each drilling and workover pit will be constructed with a minimum of a single liner. Liners will be designed and constructed as follows:

1. Liners will be composed of an impervious, reinforced, synthetic or fabricated material at least 12 mils in thickness.

2. All materials used for lining pits must be resistant to hydrocarbons, salts, and acidic and alkaline solutions. Liner materials will be resistant to tears and punctures, and be suitable for outdoor exposure. Liner compatibility must comply with EPA Method 9090A, *Compatibility Test for Wastes and Membrane Liners.*

3. The bed of the pit and inside grade of the berm will be smooth and compacted, free of holes, rocks, stumps, clods, or any other debris that may rupture the liner. In rocky areas, it may be necessary to cover the pit bed with a felt pad, compacted six-inch layer of sand, or other suitable cushioning materials.

4. The liner will rest smoothly on the pit bed and the inner face of the berms. In locations where temperature variations are significant, wrinkles or folds will be placed at each corner of the pit to allow for the contraction and expansion of the membrane due to temperature variations. The membrane manufacturer should be consulted on this matter.

5. At any point of discharge into the pit, the discharge shall be directed away

from the liner, or the liner will be protected from the fluid force of discharges.

C. EMERGENCY PITS

In accordance with 19.15.2.50.D. NMAC, in an emergency an operator may construct a pit without a permit to contain fluids, solids, or wastes if an immediate danger to fresh water, public health, or the environment exists. A pit constructed in an emergency shall be constructed, to the extent possible given the emergency, in a manner that is consistent with the requirements of 19.15.2.50 NMAC and that prevents the contamination of fresh water, and protects public health and the environment. The pit may be used only for the duration of the emergency. If the emergency lasts more than forty-eight (48) hours, the operator must seek approval from the division for continued use of the pit. All fluids, solids or wastes must be removed within 24 hours after cessation of use unless the division extends that time period.

Subsection D of 19.15.2.50 NMAC shall not be construed to allow construction or use of so-called "emergency pits," which are pits constructed as a precautionary matter to contain a spill in the event of a release. Construction or use of any such pit shall require a permit issued pursuant to 19.15.2.50 NMAC unless the pit is described in a spill prevention, control and countermeasure (SPCC) plan required by the United States environmental protection agency, all fluids are removed from the pit within 24 hours, and the operator has filed a notice of the location of the pit with the division.

D. DISPOSAL AND STORAGE PITS

Unless otherwise provided in 19.15.2.50 NMAC, disposal and storage pits must be constructed with a primary and secondary liner with a leak detection system installed between the two liners. The liners may be synthetic liners, clay liners where the bottoms and sides have a hydraulic conductivity no greater than 1×10^{-7} centimeters per second, or an alternative liner or barrier approved by the OCD which is certified by a professional engineer registered to practice in the State of New Mexico. All disposal and storage pits must contain a leak detection system as described in Section II.F. Pit liner systems will be designed and constructed as follows:

1. Wall Slopes

The outside slope of pit walls will be no steeper than 3:1 horizontal to vertical (Figure 1). The inside slope of pit walls will be no steeper than 2:1 horizontal to vertical, except for clay liners which have slope specifications as set out in subsection 2 below.

2. Clay Liners

(a) Barriers constructed with natural clay materials will be at least two

feet thick, placed in six-inch lifts, and compacted to 95 percent of the material's Standard Proctor Density (ASTM D-698).

(b) Clay materials used in a liner will undergo permeability testing before and after construction.

(c) Pre-construction permeability testing will consist of laboratory permeability tests on at least two specimens of representative clay liner materials compacted in the laboratory to 95 percent of the material's Standard Proctor Density (ASTM D-698).

(d) Post-construction permeability testing will consist of at least two laboratory permeability tests on the completed clay liner or one field permeability test on the completed soil liner. Particular emphasis will be placed on selecting the location(s) for permeability tests or test samples where non-uniformity in soil texture or color can be observed.

(e) Laboratory permeability test procedures must conform to one of the methods described for fine-grained soils in the Corps of Engineers Manual EM-1110-2-1906 Appendix VII. In no case will the pressure differential across the specimen exceed five feet of water per inch of specimen length. Field permeability tests will be conducted by the double ring infiltrometer method as described in ASTM D-3385, or equivalent methods approved by OCD. Written OCD approval must be obtained prior to use of alternate test methods.

(f) If permeability testing shows that addition of bentonite or other approved material is needed to assist the clay in meeting the permeability standard, it will be applied at a minimum rate specified by the testing or engineering firm. Any bentonite used for liner material must not have been previously used as drilling mud.

(g) Any clay liner will be constructed by disturbing the native materials to the depth of the bottom of the liner, applying fresh water as necessary to the clay materials to achieve a moisture content wet of optimum, then re-compacting it in six-inch lifts with heavy construction equipment, such as a footed roller, until the required density is achieved.

(h) Any clay liner must cover the bottom and interior of the pit entirely.

(i) Inside slopes of any clay liner will be no steeper than 3:1 horizontal to vertical.

3. Synthetic Liners

(a) Synthetic materials must be impervious, may be rigid, semi-rigid, or flexible, and will be at least 40 mils thick.

(b) If rigid or semi-rigid materials are used, leak-proof expansion joints will be provided, or the material shall be of sufficient thickness and strength to withstand, without cracking, expansion, contraction, and settling movements in the underlying earth.

(c) If flexible membrane materials are used, they will be resistant to tears and punctures.

(d) All materials used for lining pits must be resistant to hydrocarbons, salts, and acidic and alkaline solutions. Liner materials will also be resistant to ultraviolet light or provision must be made to protect the material from the sun. Liner compatibility will comply with EPA Method 9090A, *Compatibility Test for Wastes and Membrane Liners.*

(e) The bed of the pit and inside grade of the berm will be smooth and compacted, free of holes, rocks, stumps, clods, or any other debris that may rupture the liner. In rocky areas, it may be necessary to cover the pit bed with a compacted six-inch layer of sand or other suitable materials.

(f) A trench will be excavated on the top of the pit berm around the entire perimeter of the pit for the purpose of anchoring flexible liners. This trench will be located at least nine inches (9") from the slope break and will be at least twelve inches (12") deep. See Figure 3.

(g) The liner will rest smoothly on the pit bed and the inner face of the berms, and must be of sufficient size to extend down to the bottom of the anchor trench and come back out a minimum of two inches (2") from the trench on the side furthest from the pit. See Figure 3. Wrinkles or folds must be placed at each corner of the pit to allow for the contraction and expansion of the membrane due to temperature variations. The membrane manufacturer should be consulted on this matter.

(h) An anchor of used pipe or other similar material will be placed over the liner in the anchor trench and the trench back-filled.

(i) Certain conditions require the venting of gas that may accumulate beneath a liner. If organic matter exists in the soils under the liner, or if natural gas is present in the region, gas production is likely. When a fluctuating water table is present immediately below the pit bottom, pockets of air may also accumulate below the liner. The net result of gas or air accumulation below the liner may be the "floating" of the liner to the pit surface. Two possible vent designs are illustrated in Figure 4. A uniform layer of sand (which less than 5% will pass the 200 sieve) or a geotextile beneath the liners will allow the

accumulated gas to vent. To achieve the best results from either of these media, the slope from the lowest point of the pit to the toe of the dike must be at least 2%. The venting medium is carried across the entire bottom and up the side slopes. Vents will be located approximately one foot (1') down from the crown of the dike. (See Figure 3)

(j) If the lining material used for the primary liner is not sun-resistant, at least one inch (1") of sand or other suitable material must be spread uniformly to cover the liner over the floor of the pit. Gravel or other wave-resistant material with sufficient angle of repose to remain in place will be used to cover the sloping inner wall of the berm. A geotextile liner must be placed beneath any gravel layer to provide protection for the membrane liner. Any gravel or sand layers used to protect the membrane liner from the sun will extend to the anchor trench.

(k) Placement of any sand or gravel layers on top of a membrane liner will be done in such a manner that the liner is not torn.

(l) At any point of discharge into the pit, the discharge will be directed away from the liner or the liner must be protected from the fluid force of discharges.

E. BELOW-GRADE TANKS

Tanks located below the ground surface where the sidewalls are completely visible to detect leaks are not defined as below-grade tanks, and secondary containment and leak detection systems are not required.

Below-grade tanks will be designed and constructed as follows.

1. The tank will be of sufficient capacity to contain all intended fluids and wastes during periods of inclement weather when it is not possible to drain the tank on a regular schedule.

2. Tanks must be constructed of materials resistant to the particular contents of the tank. If fiber reinforced plastic tanks are used, the material must be resistant to sunlight and the tank's design must allow for expansion and contraction due to wide temperature shifts. If metal tanks are used that are not constructed of metallurgies that resist corrosion, protective coatings or cathodic protection will be used to inhibit corrosion. The plans and specifications submitted for approval will include the type of material selected and its thickness.

3. The surface upon which the tank system rests must be level and free of rocks to prevent puncturing, cracking, or indentation of the liner or tank bottom.

4. All below grade tanks must have secondary containment and a leak detection system. Below-grade tank systems will consist of either a double wall system with a mechanism for determining leaks, a tank in a drainage and collection system, or other OCD approved system.

5. Tanks in a drainage and collection system will be constructed as follows:

   (a) First place a synthetic, impermeable liner at least 40 mils thick upon a smooth soil surface that will support the tank with the liner extending above the ground surface.

   (b) Place a slotted or perforated drainage pipe (lateral) on the impermeable layer with the drainage pipe sloped at least one inch per 10 feet towards the collection system. The drainage pipe will be at least one inch in diameter.

   (c) Cover the drainage pipe with sand, gravel, or other material with sufficient permeability to convey fluids to the drainage pipe.

   (d) Place the tank on this surface and connect a riser pipe to the collection system. The riser pipe will be at least 2 inches in diameter.

   (e) Strap the secondary liner to the tank above the ground surface in a manner to prevent rainwater from entering the space between the tank and liner.

6. Avoid placing tanks within ground water. If a tank is placed within ground water, the tank system will be placed in a one (1) foot thick reinforced concrete vault. The vault will be maintained in a dry condition at all times.

F. PIT LEAK DETECTION SYSTEMS

1. Leak detection systems may consist of fail-safe electric detection systems or drainage and collection systems.

2. If an electric grid detection system is used, provision must be made for adequately testing all components to ensure the system remains functional.

3. If a drainage and collection system is used, a network of slotted or perforated drainage pipes will be installed between the primary and secondary liners. The network must be of sufficient density so that no point in the pit bed is more than twenty feet (20') from such drainage pipe or lateral thereof. The material placed between the pipes and laterals must be sufficiently permeable to allow transport of the fluids to the drainage pipe. The slope for all drainage lines and laterals will be at least 12 inches (12") per hundred feet

(100'). The slope of the pit bed must also conform to these values to assure fluid flow towards the leak detection system. The drainage pipe will convey liquids to a corrosion-proof collection system located outside the perimeter of the pit (see Figure 2).

4. Double lined disposal and storage pits constructed with synthetic liners shall be designed to allow slippage between the primary and secondary liner as the weight of fluid in the pit causes movement in the primary liner.

G. FENCES, SIGNS AND NETTING

1. A fence will be constructed and maintained in good condition around the pit perimeter. The fences will be constructed so as to prevent livestock from entering the pit area. Active drilling or workover pits may have a portion of the pit unfenced to facilitate operations. In issuing a permit, the division may impose additional fencing requirements for protection of wildlife in particular areas.

2. Unless the pit is located on a well site controlled by the operator of the pit, a sign not less than 12" x 24" with lettering of not less than two inches (2") will be posted in a conspicuous place on the fence surrounding the pit. The sign will be maintained in legible condition and must identify the operator of the pits, the location of the facility by quarter-quarter or unit letter, section, township, and range, and provide emergency telephone numbers.

3. To protect migratory birds, all tanks exceeding 16 feet in diameter, and exposed pits and ponds must be screened, netted or covered. Upon written application by the operator, an exception to screening, netting or covering of a facility may be granted by the district supervisor upon a showing that an alternative method will protect migratory birds or that the facility is not hazardous to migratory birds. Drilling and workover pits are exempt from this netting requirement, if any visible or measurable layer of oil present is removed from the surface immediately after cessation of operations.

H. NOTIFICATION

At least twenty-four hours prior to installing primary liners over leak detection systems of disposal or storage pits, the operator of the pit will notify the OCD District Office so that an inspection can be scheduled. The operator will take photographs of the installation and retain the records for OCD inspection if required.

III. OPERATION AND MAINTENANCE OF BELOW-GRADE TANKS AND DISPOSAL AND STORAGE PITS

A. Leak detection systems will be inspected at least once every thirty (30) days. The proposed frequency will be included with plans submitted for approval.

B. The operator will report the detection of fluid within the leak detection system to the appropriate OCD District Office within 24 hours of discovery. The operator will obtain a sample of the fluid, and have the sample analyzed for major cations/anions, benzene, toluene, ethylbenzene, total xylenes (BTEX), and any other potential water contaminant within the pit or below-grade tank. A copy of the analysis will be sent to the appropriate OCD District Office. An analysis of the fluids in the pit or tank may be required for comparison with the above analysis. If the presence of fluid in the leak detection system is due to a leak, the contingency plan will be implemented.

C. The operator will prepare and maintain a contingency plan outlining the procedure for repairing the pit liner or tank in an expeditious manner in the event of a leak, or upon discovery of tears or punctures in liners. It must describe how the operator proposes to guard against such accidents and detect them when they have occurred. The contingency plan also must describe the steps proposed to contain and remove the spilled substance or mitigate the damage caused by the discharge such that ground water is protected, or movement into surface waters is prevented.

D. The operator of the pit or below-grade tank must report releases from pits or below-grade tanks to the OCD pursuant to 19.15.3.116 NMAC.

E. No measurable or visible layer of oil may be allowed to accumulate or remain anywhere on the surface of any disposal or storage pit.

F. Spray evaporation systems shall be operated such that all spray-borne suspended or dissolved solids remain within the perimeter of the pond's lined portion.

IV. WASTE MANAGEMENT

The following discussion summarizes alternatives for management of pit and below grade tank wastes. All procedures used are to be approved by OCD prior to commencement. Separate OCD-approval is not required if the OCD has approved a general closure plan which includes the techniques used at any particular site. All procedures that deviate from the general closure plan, however, must be approved by OCD prior to commencement.

RCRA exempt or RCRA nonhazardous oil and natural gas related wastes will be remediated and managed according to the criteria described below.

A. RESIDUAL WASTES

Residual wastes remaining in any pit or below-grade tank will be handled in the following manner:

1. Remaining liquids will be removed from the pit or below-grade tank to the maximum extent practicable; and

2. Remaining solid wastes (i.e. buckets, cans, miscellaneous trash, debris,

contaminated solids, etc.) will be removed from the pit or below-grade tank, except for dried mud and cuttings, cement, and frac materials in drilling and reserve pits which have been approved by the OCD for encapsulation under Section IV.B.2. and Section IV.B.3.

B. WASTE MANAGEMENT OPTIONS

Waste management options must be submitted to and approved by OCD prior to commencement of remediation activities. The following is a list of disposal options:

1. Excavated or removed wastes may be disposed of at an off-site OCD-approved facility.

2. Contents of drilling and workover pits from wells which have not penetrated a salt section, and where less than 9.5 lb. brine was used during drilling or workover may be encapsulated below-grade. Encapsulation will be accomplished by mixing earthen materials with the pit contents to stiffen the pit contents, as necessary, folding the edges of the liner over the stiffened mud and cuttings and covering the encapsulated wastes and liner with a minimum of 3 feet of clean soil or like material that is capable of supporting native plant growth. The operator is encouraged to notify the landowner of the property upon which the drilling or workover pit is located of the proposed encapsulation of the wastes prior to conducting the activities.

3. Contents of drilling and workover pits from wells which have penetrated a salt section or 9.5 lb. brine or greater was used during drilling or workover may be capped and encapsulated insitu or be deep trench buried and capped below-grade as set out below if the liner has maintained its integrity. The operator is encouraged to notify the landowner of the property upon which the drilling or workover pit is located of the proposed deep trench burial of the wastes prior to conducting the activities.

   (a) Capping and encapsulation insitu will be accomplished by mixing earthen materials with the pit contents, as necessary to stiffen the pit contents sufficiently to provide physical stability and support for the pit cover; folding the edges of the liner over the stiffened mud and cuttings; capping the pit with either a 1-foot thick clay cap compacted to ASTM standards, or a 20 mil minimum thickness impervious, reinforced, synthetic or fabricated liner meeting ASTM standards that is designed to be resistant to the material encapsulated; and covering the cap with a minimum of 3 feet of clean soil or like material that is capable of supporting native plant growth.

   (b) Deep trench burial and capping will be accomplished by digging a trench adjacent to the drilling or workover pit; lining the trench with an impervious, reinforced, synthetic or fabricated liner at least 12 mils in thickness; mixing earthen materials with the pit contents, as necessary to

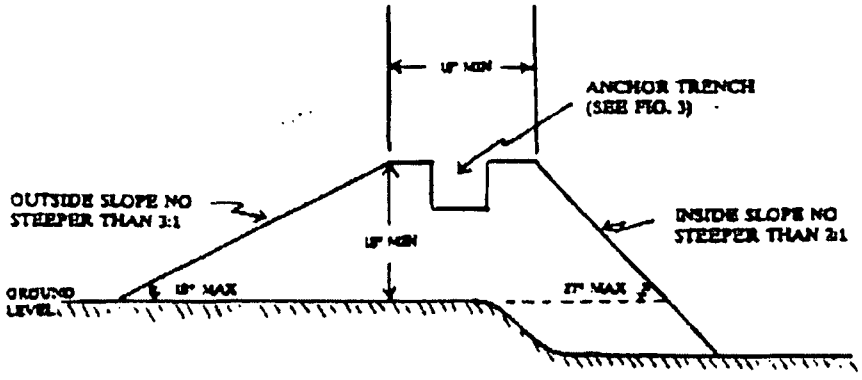
stiffen the pit contents sufficiently to provide physical stability and support for the trench cap; emplacing the drilling or workover pit contents and liner into the lined trench; folding the edges of the trench liner over the stiffened mud and cuttings; capping the trench with either a 1-foot thick clay cap compacted to ASTM standards, or a 20 mil minimum thickness impervious, fiber reinforced, synthetic or fabricated liner meeting ASTM standards that is designed to be resistant to the material encapsulated; and covering the cap with a minimum of 3 feet of clean soil or like material that is capable of supporting native plant growth.

(c) When constructing the cap, the synthetic liner or clay cap will overlap the underlying pit or trench area by at least 3 feet in all directions. Once capping of the pit or trench is complete, the synthetic or clay cap will not be disturbed in the future without prior approval of the OCD.

V. FINAL CLOSURE

Upon termination of any required actions, the surface where the pit or below-grade tank was located will be contoured to prevent erosion and ponding of rainwater over the site.

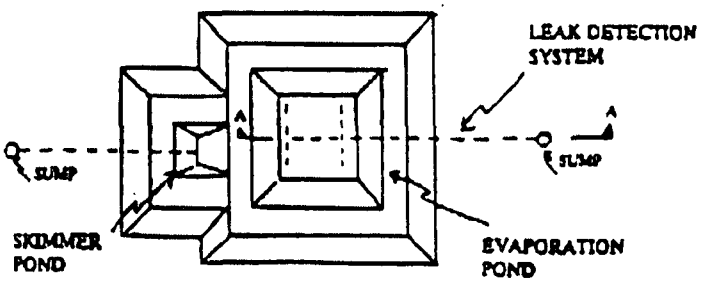
FIGURE 1: PIT CONSTRUCTION



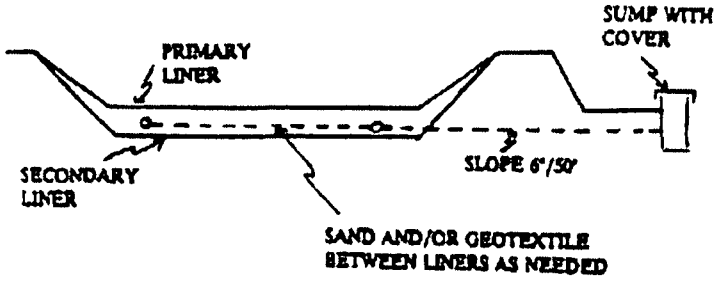
NOTE: LEVEE TO BE CONSTRUCTED IN A MANNER SUCH THAT DESIGN COMPACTION AND DIMENSIONS PROVIDE FOR A MINIMUM SAFETY FACTOR OF TWO FOR FORCES ACTING AGAINST THE LEVEE.

FIGURE 2 - LEAK DETECTION SYSTEM

PLAN



SECTION A-A



NOTE: SKIMMER POND TO HAVE SEPARATE LEAK DETECTION SYSTEM AND SUMP.

FIGURE 3 - ANCHOR TRENCH

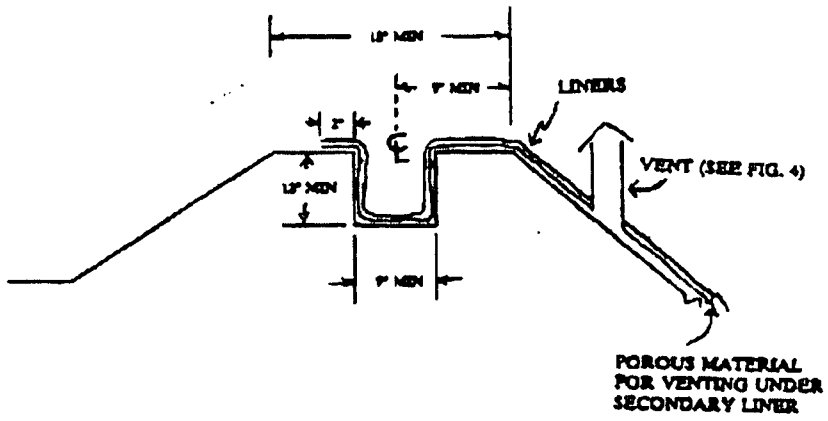


FIGURE 4 - VENT DESIGNS

SOURCE: EPA REPORT #SW-870, "LINING OF WASTE IMPOUNDMENT FACILITIES", PG. 260