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NEW MEXICO ENVIRONMENTAL DEPARTMENT
GROUND WATER POLLUTION PREVENTION SECTION

**GUIDELINES FOR LINER MATERIAL
AND SITE PREPARATION FOR
SYNTHETICALLY-LINED LAGOONS**

December 11, 1995

PURPOSE: The following guidelines regarding the site preparation and choice of material(s) for synthetically-lined lagoons has been developed to ensure the safe containment of liquids that have the potential to contaminate ground water. The term "lagoon" refers to a constructed containment unit to store wastewater, industrial liquids, etc. These guidelines do not apply to lagoons storing hazardous wastes and does not supersede federal, state or local regulations.

LINER MATERIAL

There are many different liner materials available, each with different properties. Generally, the liner material chosen must be compatible with its intended use. Specifically, any liner material used to form an impermeable barrier in a liquid containment lagoon must satisfy the following:

- 1) the liner shall be chemically compatible with any material that will contact the liner;
- 2) the liner material shall be resistant to deterioration by sunlight if any portion of the liner will be exposed. If the liner is not UV resistant, it shall be completely covered by a minimum of 6 inches of approved cover material;
- 3) synthetic liner material shall be of sufficient thickness to have adequate tensile strength and tear and puncture resistance. Under no circumstances shall a synthetic liner material less than 30 mils in thickness, if reinforced, or 40 mils in thickness, if a film material, be acceptable. Any liner material shall be pre-approved by a professional engineer and by the New Mexico Environment Department (NMED) prior to its installation.

LAGOON DESIGN AND SITE PREPARATION

Without proper lagoon design and site preparation, effective containment cannot be assured, regardless of the liner material selected. The following design and construction requirements shall be adhered to:

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- 1) inside slopes shall be no greater than 3:1 (i.e. 18° from horizontal);
- 2) lagoon volume (discharge + runoff + precipitation) shall be designed to allow for a minimum 24 inches of freeboard;
- 3) the liner must be installed with sufficient liner material to accommodate shrinkage due to temperature changes. Folds in the liner are not acceptable;
- 4) to a depth of at least 6 inches below the liner, the subgrade (soil beneath the liner) shall be free of sharp rocks, vegetation and stubble. The surface in contact with the liner shall be smooth to allow for good contact between liner and sub-grade. The surface shall be dry during liner installation;
- 5) sub-grade shall be compacted to a minimum of 90% of standard proctor density;
- 6) synthetic liners shall be anchored in an anchor trench in the top of the berm. The trench shall be a minimum of 12 inches wide, 12 inches deep and shall be set back at least 24 inches from the inside edge of the berm;
- 7) if the lagoon is installed over areas of decomposing organic materials or shallow ground water, a liner vent system shall be installed. This system shall be pre-approved by the NMED;
- 8) any opening in the liner through which a pipe or other fixture protrudes shall be properly sealed;
- 9) a synthetic liner shall not be installed in temperatures below freezing;
- 10) the installer of the liner shall be experienced installing the chosen liner material. The installer shall have successfully completed a minimum of 2 installations. Installation shall be supervised by a representative of the liner manufacturer or the distributor;
- 11) all manufacturer's installation and field seaming guidelines shall be followed;
- 12) all synthetic liner seams shall be field tested by the installer and certification of the adequacy of the seams shall be supplied to the NMED;

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Synthetic Liner Guidelines

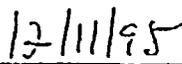
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- 13) NMED shall be notified in advance when construction of the lagoon is to begin. NMED shall be notified upon completion of the liner installation and prior to any discharge to the lagoon to allow NMED the opportunity to inspect the liner installation.
- 14) as-built plans for all lagoons shall be submitted within 30 days of completion of construction. These plans shall be certified to be true by a professional engineer.

Any deviation from the above guidelines shall be pre-approved by NMED.



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Ground Water Protection &
Remediation Bureau



Date

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