

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

POND SEALING OR LINING - FLEXIBLE MEMBRANE

(NO.)

CODE 521A

DEFINITION

A manufactured hydraulic barrier consisting of a functionally continuous sheet of synthetic or partially synthetic, flexible material.

PURPOSE

To control seepage from water and waste impoundments for water conservation and environmental protection.

CONDITION WHERE PRACTICE APPLIES

On ponds and water storage structures that require treatment to control seepage rates within acceptable limits.

On waste storage and waste treatment facilities built in or of excavated earth, and which require treatment to prevent the migration of contaminants from the site.

CRITERIA

Structures to be lined shall have been constructed to meet all applicable NRCS standards. All inlets, outlets, ramps, and other appurtenances may be installed before, during, or after the liner placement, but shall be done in a manner that does not damage or impair the proper operation of the liner.

All flexible membranes shall be certified by the manufacturer to be suitable for the intended use.

Design of the flexible membrane shall be in accordance with manufacturer recommendations. [Selection of criteria for materials not described in Table 1, or use of criteria less than that specified in Table 1 are acceptable if based on a site specific engineering analysis and documented performance history.](#)

TABLE 1. Minimum Criteria for Membranes

Type	Limiting Parameter
HDPE	40 mil thickness
LLDPE	40 mil thickness
PVC	30 mil thickness
GCL	0.75 lb./sq ft (bentonite)
EPDM	45 mil thickness

HDPE = High Density Polyethylene

LLDPE = Linear Low Density Polyethylene

PVC = Polyvinyl Chloride

GCL = Geosynthetic Clay Liner

EPDM = Synthetic Rubber

[If high water tables could adversely affect the proper functioning of the facility, interceptor or relief type drainage systems should be designed to control uplift pressures.](#)

[Venting should be considered if gas build up under the liner is anticipated.](#) If venting is used, manufacturer recommendations shall be followed regarding vent type and spacing.

Subgrade preparation shall conform to manufacturer recommendations. Subgrade materials shall not contain sharp, angular stones or any objects that could damage the liner or adversely impact its function.

Manufacturer recommendations shall be followed with regard to protection from weather and exposure.

Select soil materials shall be used as cover for liners where required for the proper performance, protection, and durability of the installation. Cover soils shall not contain sharp, angular stones or any objects that could damage

the liner. Maximum allowable particle size of soil cover material shall be 3/8-in (10 mm), unless the liner is cushioned by a needle punched, non-woven geotextile. Cover materials shall be stable under all operational and exposure conditions.

All structures shall be fenced to protect the liner from damage and for the safety of humans, livestock, wildlife, and pets.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared for specific field sites in accordance with this standard and shall describe the requirements for applying the practice to achieve its intended uses.

All flexible membrane installations shall meet the material and installation requirements of the plans and specifications provided by the designer or manufacturer for each installation, and shall be certified by the installer.

OPERATION AND MAINTENANCE

A plan shall be prepared for specific field sites in accordance with this standard and shall describe operation and maintenance that will assure the liner accomplishes the planned purpose(s) for its intended design life.