

NMED DESIGN CRITERIA FOR LARGE CAPACITY SEPTIC TANK-LEACHFIELD SYSTEMS

Ground Water Quality Bureau
New Mexico Environment Department

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General Information

Large capacity septic tank – leachfield (LCSTL) systems are designed to receive greater than 2,000 gallons per day, and are regulated under the authority of the New Mexico Water Quality Control Commission (WQCC) Regulations (20.6.2 NMAC). Owners of LCSTL systems are required to obtain a ground water discharge permit, issued by the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) prior to any discharge.

Septic tank – leachfield systems provide only partial treatment of wastewater - resulting in the discharge of water contaminants from the leachfield. Studies across the country have found that conventional septic tank – leachfield systems pollute groundwater. For example, in New Mexico discharges from conventional septic tank – leachfield systems have impacted hundreds of water supply wells in Bernalillo County (CH2M Hill, 1992), and LCSTL systems have been found to have impacted ground water quality at numerous locations throughout the State (GWQB, 2001). As a result, the GWQB is now only approving new permits proposing LCSTL systems under limited circumstances. The GWQB encourages applicants to schedule a preliminary meeting with the GWQB to discuss project plans and site-specific conditions at the proposed discharge location to determine if a LCSTL system is approvable.

WQCC Regulations require the permit applicant to submit a discharge permit application which demonstrates that the discharge will not result in an exceedence of ground water standards (WQCC 20.6.2.3109). **Except under unusual circumstances, this demonstration will require the installation of ground water monitoring wells.**

Design flows shall be based on generally accepted references such as current editions of the *Uniform Plumbing Code (UPC)* and *USEPA Design Manual: On-site Wastewater Treatment and Disposal Systems*. Design flows also may be based on professional engineering or professional design calculations, if more restrictive, or measured flows. Measured flows shall include a safety factor of 1.5 to account for peak flows.

NMED shall be notified at least 30 days prior to the repair or modification of an existing LCSTL system.

Septic Tank Standards

Septic Tank Sizing and Design Specifications

The septic tank(s) shall be designed to produce a clarified effluent and sized to ensure that a 24 hour hydraulic retention time is maintained in the tank when solids occupy one half of the tank volume.

$$\text{Required Tank Capacity} = \text{Peak Daily Volume} * 2$$

The inlet pipe to the septic tank, and the outlet pipe from the tank to the undisturbed soil beyond the tank, must meet the strength requirements of American Society for Testing and Materials (ASTM) schedule 40 plastic pipe and must be supported in a manner such that there is no deflection during the backfilling and subsequent settling of the soil between the edge of the septic tank and the edge of the excavation or utilize other fittings as approved by NMED.

A septic tank outlet filter must be installed in the last compartment of the septic tank (or the last tank if multiple tanks are installed in series) prior to discharge from the tank. The filter shall be in place and operational at all times. The filter must be readily accessible for routine inspection and cleaning. Utilization and sizing of the outlet filters shall be in accordance with the manufacturer's recommendations.

All concrete septic tanks shall be protected from corrosion by coating internally with a bituminous coating or by other acceptable means.

Septic Tank Installation

All septic tanks shall be tested for water tightness prior to backfill. The installer must perform one of the following testing procedures:

Water pressure testing: seal the tank(s) and fill with water and let stand for 24 hours. Refill the tank(s). The tank passes the test if the water level remains at a constant level in the tank for a period of 1 hour.

Vacuum testing: seal the tank(s) and apply a vacuum to 2 inches (50 mm) of mercury. The tank passes the test if the vacuum remains constant for a period of 1 hour.

The tank shall be backfilled in uniform, compacted layers, not exceeding eight (8) inches in thickness, distributed evenly around the perimeter of the tank.

Access to each septic tank shall be provided by at least two access-ways, each with a diameter of 24 inches. The access-ways shall be located over the inlet and outlet devices of septic tanks for the purpose of inspections, and sludge and scum removal. The access-ways shall be extended from the tank to 3 inches above the ground surface or as approved by NMED. The access-ways shall have a secured lid to deter unauthorized access. A secure lid shall consist of one of the following: a padlock; a twist lock cover requiring special tools for removal; a cover weighing 58 pounds or more, net weight; or, a stainless steel hinge and hasp mechanism.

Cast in place tanks must be designed and certified by a New Mexico Registered Professional Engineer. Septic tanks may be installed under concrete or paving but must have access-ways.

Pump Station and General Equipment Standards

Pump stations or pump chambers, when required, shall be tested for water tightness and may be constructed of concrete, plastic, fiberglass or other approved material. Tanks and chambers shall be designed and constructed so as to serve their intended purpose and appropriately coated to resist corrosion.

All valves, motors, pumps, aerators and other mechanical or electrical devices shall be located where they will be accessible for inspection and repair at all times and protected with a secure lid.

At a minimum, pump stations or pump chambers shall be equipped with both audible and visual alarms on separate circuits, for high water and pump failure. All alarm and control circuits shall be contained in weatherproof control boxes or located inside a building or other weatherproof structure. Alarms shall be placed in a conspicuous location approved by the NMED.

Leachfield Standards

Leachfield Sizing and Design Specifications

Leachfield wastewater application rates shall be determined using site-specific soil type and texture pursuant to the current revisions of the NMED Liquid Waste Disposal Regulations or other method approved by NMED.

Aggregate-Pipe-Trench Leachfield

- Trenches shall be a maximum of 36 inches wide.
- A minimum of 12 inches and a maximum of 36 inches of suitable aggregate shall be placed below the distribution pipe.
- The absorption area shall be calculated based on the bottom area only for aggregate depth equaling 12 inches below the distribution pipe.
- Sidewall credit shall be given for depth in excess of the first 12 inches below the distribution pipe.

Where leaching beds are designed in lieu of trenches, the area of the bed shall be at least fifty (50) percent greater than the area required for trenches.

For alternative (non-aggregate) leachfield products, the absorption area shall be calculated based on the bottom area only, for an invert of 12 inches or less. Sidewall credit will be given for invert heights exceeding 12 inches. With the exception of sidewall credit, no further reduction in leachfield sizing will be granted for alternative leachfield products.

When more than five-hundred (500) linear feet of leach line is required, a low-pressure dosed system shall be used.

A vertical pipe, four inches in diameter and perforated in the bottom twelve inches, must be installed in each leachfield trench or bed of the waste disposal system for the purpose of observing water levels within the disposal field. The pipe shall be anchored in the ground, extend above the ground surface (but not to exceed 18”), and have a removable cap.

Leachfield Construction

Leachfields shall not be covered by concrete, paving, or other impermeable material, and not be constructed under a roadway or driveway.

Before placing aggregate material or drain lines in a prepared excavation, all smeared or compacted surfaces shall be removed from trenches by raking to a depth of one (1) inch and the loose material removed. Clean, washed stone, gravel, slag, or similar aggregate material acceptable to NMED, varying in size from three fourths (3/4) inch to two and one half (2 ½) inches shall be placed in the trench to the depth and grade required. The drain lines shall then be covered with aggregate material to a minimum depth of two (2) inches and then covered with geo-tech fabrics, untreated building paper, straw, or similar porous material to prevent closure of voids with earth backfill.

Aggregate-Pipe-Trench Leachfield Construction Specifications

	<u>MINIMUM</u>	<u>MAXIMUM</u>
Number of drain lines	1 per field	-
Length of each line	-	100 ft (gravity flow)
Bottom width of trench	-	36 in.
Spacing of lines, center to center	6 ft	-
Depth of earth cover over lines	12 in.	-
Grade of lines	level	3 in./100 ft.
Aggregate material under drain lines	12 in.	36 in.
Aggregate material over drain lines	2 in.	-

Designated Reserve Leachfield Area

The design of all LCSTL systems shall include the designation of an undeveloped area of the property permanently reserved for the installation of a replacement/secondary leachfield in the event of a failure of the original leachfield.

Monitoring Wells Standards

Monitoring Well Design and Construction

Monitoring wells shall be constructed according to the NMED-GWPPS Monitoring Well Construction and Abandonment Guidelines.

Minimum Setback and Clearance Requirements

All LCSTL systems shall meet the following minimum setback and clearance requirements:

From:	To:	Building Sewer	Treatment Unit	Disposal Field
Property Lines		--	5 ft.	5 ft.
Building or Structure		2 ft.	5 ft.	8 ft.
Distribution Box		--	--	5 ft.
Disposal Field		--	10 ft.	--
Drinking Water Line				
- Private		1 ft.	10 ft.	10 ft.
- Public		10 ft.	10 ft.	10 ft.
Drinking Water Source/Well				
- Private		50 ft.	50 ft.	100 ft.
- Public		50 ft.	100 ft.	200 ft.
Irrigation Well		50 ft.	50 ft.	100 ft.
Lined Canals		--	10 ft. ¹	10 ft. ¹
Unlined Canals, drainage ditches		--	15 ft. ¹	25 ft. ¹
Arroyos		--	15 ft. ¹	25 ft. ¹
Other Watercourses, Waters of the State		--	50 ft.	100 ft.
Retention/detention area			15 ft.	15 ft.
Seasonal High Water Table, Bedrock & other impervious Layers		--	--	Subject to NMED Approval

⁽¹⁾ Plus depth of channel