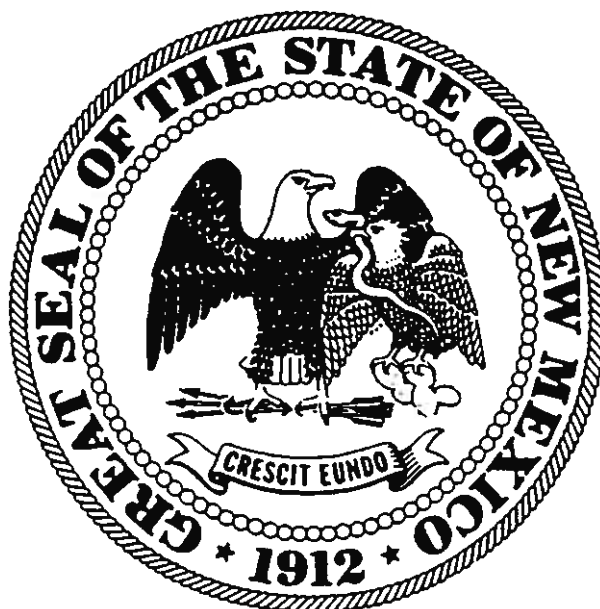


LIQUID WASTE DISPOSAL REGULATIONS



**Liquid Waste Disposal Regulations
20 NMAC 7.3**

Table of Contents

Subpart I - General Provisions	1
101. Issuing Agency	1
102. Scope	1
103. Statutory Authority	1
103.A. Pre-NMAC Regulatory Filing History	1
103.B. History of Repealed Material	2
104. Duration	2
105. Effective Date	2
106. Objective	2
107. Definitions	2
108. Interpretation	13
109. Alternative Resources	13
110. Authority to Disconnect Source of Water Supply	14
111. Technical Advisory Committee	14
Subpart II - Procedures	15
201. Liquid Waste System Permits	15
202. Variances	18
203. Appeals	25
204. Inspections and Sampling	26
Subpart III - Standards	27
301. General Requirements	27
302. Lot Size Requirements	28
303. Setback Requirements	34
304. Clearance Requirements	35
305. Holding Tank Requirements	36
306. Alternative Systems	38
307. Septage	39
308. Operation Requirements	39
309. Maintenance of On-Site Liquid Waste Systems	39

Subpart IV - Design 40

401.	General	40
402.	Liquid Waste Tank Design and Construction	40
403.	Area of Disposal Field and Seepage Pits	50
404.	Percolation Tests	52
405.	Disposal Field Design and Construction	53
406.	Seepage Pit Design & Construction	55
407.	Special Liquid Waste Disposal	56
408.	Inspection and Testing	56
409.	Aerobic Treatment Systems	57
410.	Abandoned Sewers and On-Site Liquid Waste Systems	57

Subpart V - Miscellaneous 59

501.	Construction	59
502.	Temporary Provisions	59
503.	Severability	59
504.	References in Other Regulations	59
505.	Savings Clause	59
506.	Collateral Requirements	59
507.	Limitation of Defense	59

Tables, Figures

Table 302.1	Minimum Lot Sizes for Typical Flow Rates	29
Table 302.3	Record Date	32
Table 302.4	Soil Characteristics	33
Table 303.1	Minimum Setbacks and Clearance Requirements	35
Table 402.1	Capacity of Septic Tanks	42
Table 402.2	Established Liquid Waste Design Flow Rates	43
Table 403.1	Soil Absorption Areas	51
Figure 302.2	Minimum Lot Size per Flow Rate	30

Attachment

IAPMO Material and Property Standard for Prefabricated Septic Tanks (PS 1-93)

ENVIRONMENTAL IMPROVEMENT BOARD

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SANTA FE, NEW MEXICO 87502
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**TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 7 WASTEWATER AND WATER SUPPLY FACILITIES
PART 3 LIQUID WASTE DISPOSAL**

100. SUBPART I - GENERAL PROVISIONS

101. ISSUING AGENCY. Environmental Improvement Board.
[10-15-97]

102. SCOPE.

A. This Part applies to on-site liquid waste systems that are designed to receive and do receive two thousand (2,000) gallons or less of liquid waste per day, and that do not generate discharges that require a Discharge Plan pursuant to 20 NMAC 6.2 or a National Pollutant Discharge Elimination System (NPDES) Permit. [10-15-97]

B. Sections 305 and 307 apply to the disposal of on-site septage and holding tank wastes. [10-15-97]

103. STATUTORY AUTHORITY. NMSA 1978, Sections 74-1-6, 74-1-7(A)(3), 74-1-8(A)(3), and 74-1-9(Repl. Pamp 1993 and Cum. Supp. 1997). [10-15-97]

103A. PRE-NMAC REGULATORY FILING HISTORY. The provisions in this Part were derived from material previously filed with the State Records Center and Archives under: Liquid Waste Disposal Regulations, EIB 73-4, filed 9-19-73; Liquid Waste Disposal Regulations, EIB 79-7-2, filed 8-7-79; Liquid Waste Disposal Regulations, EIB 79-7-2, Amendment No. 1, filed 1-30-80; Liquid Waste Disposal Regulations, EIB 79-7-2, Amendment No. 2, filed 8-26-81; Liquid Waste Disposal Regulations, EIB/LWDR 1, filed 10-10-85; Liquid Waste Disposal Regulations, EIB/LWDR 2, filed 12-19-89. [10-15-97]

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10-15-97

103B. HISTORY OF REPEALED MATERIAL. This Part repeals and replaces 20 NMAC 7.3, Liquid Waste Disposal, which was filed with the State Records Center on 10-27-95 with an effective date of 11-30-95. [10-15-97]

104. DURATION. Permanent. [10-15-97]

105. EFFECTIVE DATE. October 15, 1997, except where a later effective date is indicated in the history note at the end of a Section or Paragraph. [10-15-97]

106. OBJECTIVE. To protect the health and welfare of present and future citizens of New Mexico by providing for the prevention and abatement of public health hazards and surface and ground water contamination from on-site liquid waste disposal practices. [10-15-97]

107. DEFINITIONS. As used in this Part:

A. "aerobic treatment system" means any treatment system which stabilizes liquid waste through the addition of supplemental air or dissolved oxygen by means of mechanical or diffused aeration. Dissolved oxygen content must be maintained at a minimum of 2.0 mg/L for a system to be considered an aerobic system; [10-15-97]

B. "advanced treatment" or "tertiary treatment" means any process of water renovation that upgrades liquid waste to meet specific reuse requirements. Advanced treatment may include general cleanup of wastewater or removal of specific types of wastes, such as nitrates or other nitrogen compounds, insufficiently removed by primary or secondary treatment processes. Advanced treatment may include physical or chemical treatments; [10-15-97]

C. "alternative system" means any on-site liquid waste system utilizing a method of liquid waste treatment and disposal that is not recognized and allowed by this Part or by the New Mexico Design Standards; [10-15-97]

D. "anaerobic treatment" means a biological process through which organic material is decomposed in an environment containing no dissolved oxygen; [10-15-97]

E. "approved" means materials, products, or procedures that meet the requirements of the New Mexico Design Standards; [10-15-97]

F. "arroyo" means a dry wash or draw which flows only occasionally, a watercourse (as a creek or stream) in an arid region, or a water carved gully or channel; [10-15-97]

G. "bedrock" means the more or less solid, undisturbed rock in place either at the surface or beneath surficial deposits of gravel, sand or soil, or a consolidated rock formation of impervious material which may exhibit jointed, fractured, or deteriorated characteristics; [10-15-97]

H. "bedroom" means any room or unfinished area within a dwelling that reasonably might be used pursuant to the New Mexico Building Code as a sleeping room; [10-15-97]

I. "biochemical oxygen demand" or "BOD" means the rate at which organisms use the oxygen in water or wastewater while stabilizing decomposable organic matter under aerobic conditions; [10-15-97]

J. "black water" means waste from a liquid flushing toilet, urinal or garbage disposal; [10-15-97]

K. "body of water" means all constrained water including water situated wholly or partly within or bordering upon New Mexico, whether surface or subsurface, public or private; [10-15-97]

L. "building drain" means that part of the lowest piping of a drainage system which receives the collective liquid waste discharge from soil, waste and other drainage piping inside a building and conveys it to the building sewer which begins two (2.0) feet outside the building wall; [10-15-97]

M. "building sewer" means that part of the horizontal piping of a drainage system which extends from the end of the building drain located two (2.0) feet outside the building wall and which receives the liquid waste discharge from the building drain and conveys it to a liquid waste treatment unit or approved point of disposal; [10-15-97]

N. "canal" means a man-made ditch or channel that carries water for purposes other than domestic consumption; [10-15-97]

O. "cesspool" means an excavation or non-water tight unit which receives untreated water-carried liquid waste allowing direct discharge to the soil; [10-15-97]

P. "clearance" means the vertical thickness of suitable soil between the lowest point of a liquid waste disposal system and the seasonal high ground water table, bedrock, or other limiting layer; [10-15-97]

Q. "commercial unit" means a structure without bedrooms but with sinks, baths, showers, toilets, urinals, floor drains for receiving liquid waste; [10-15-97]

R. "degrade a body of water" means to reduce the physical, chemical or biological qualities of a body of water and includes, but is not limited to, the release of material which could result in the exceeding of standards established by 20 NMAC 6.1, Standards for Interstate and Intrastate Streams, by 20 NMAC 6.2, Ground and Surface Water Protection, and by 20 NMAC 7.1, Drinking Water; [10-15-97]

S. "Department" means the New Mexico Environment Department; [10-15-97]

T. "design flow" means the flow rate for which an on-site liquid waste system must be designed in order to assure acceptable system performance, assuming the use of conventional plumbing fixtures.

1. For residential sources, the design flow shall be calculated assuming two (2) persons per bedroom for the first two (2) bedrooms and one (1) person per additional bedroom in a single family dwelling unit, and seventy-five (75) gallons per person per day. Multiple family dwelling unit source design flows shall be calculated as the sum of design flows for each single family unit included.

2. Design flows for nonresidential sources shall be based on Table 402.2 and generally accepted references (such as the Uniform Plumbing Code or the USEPA Design Manual: On-site

Wastewater Treatment and Disposal Systems). Design flows for nonresidential sources also may be based on professional engineering or professional design calculations, if more restrictive, or measured flows. Design flows for nonresidential sources shall include a safety factor of 1.5 to account for peak flows;

[10-15-97]

U. "disinfected" or "disinfection" means the use of any process designed to effectively kill most micro-organisms contained in liquid waste effluent including essentially all pathogenic (disease causing) bacteria. These processes include but are not limited to, suitable oxidizing agents such as chlorine, ozone and ultraviolet light; [10-15-97]

V. "disposal system" means a generally recognized system for disposing of the discharge from a liquid waste treatment unit and includes, but is not limited to, seepage pits, drainfields, evapotranspiration systems, sand mounds, sand filters, and approved surface applications; [10-15-97]

W. "dwelling" or "dwelling unit" means a structure which contains bedrooms; [10-15-97]

X. "edge of a watercourse, canal or arroyo" means that point of maximum curvature at the upper edge of a definite bank or, if no definite bank exists, the highest point where signs of seasonal high water flow exist; [10-15-97]

Y. "effluent" means treated liquid waste; [10-15-97]

Z. "effluent disposal well" means a drilled, driven, or bored shaft or dug hole with depth greater than any surface dimension, used for subsurface emplacement of liquid waste, including, but not limited to, abandoned water supply wells, irrigation wells, and test holes, but excluding seepage pits used as disposal systems, which conform to the standards in this Part; [10-15-97]

AA. "enclosed system" means a watertight on-site liquid waste system which does not discharge to the soil, including, but not limited to, holding tanks and lined evapotranspiration systems;

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[10-15-97]

AB. "established on-site liquid waste system" means an on-site liquid waste system which has been in active and trouble free use at any time during the ten (10) years prior to submission of a permit application, but does not include cesspools; [10-15-97]

AC. "evapotranspiration system" means a disposal system designed to dispose of all the design flow from a liquid waste treatment unit through evaporation and plant uptake and transpiration; [10-15-97]

AD. "failed system" means, without limitation, an on-site liquid waste system that does not operate as permitted, that does not provide a level of treatment at least as effective as that provided by on-site liquid waste systems that meet the requirements of this Part and the New Mexico Design Standards, or that poses a hazard to public health or degrades a body of water; [10-15-97]

AE. "fixture units" means a quantity of flow as defined in the UPC upon which plumbing systems are sized; [10-15-97]

AF. "greywater" means water carried waste from kitchen (excluding garbage disposal) and bathroom sinks, wet bar sinks, showers, bathtubs and washing machines. Greywater does not include water carried wastes from kitchen sinks equipped with a garbage disposal, utility sinks, any hazardous materials, or laundry water from the washing of material soiled with human excreta; [10-15-97]

AG. "ground water" means interstitial water which occurs in saturated earth material and which is capable of entering a well in sufficient amounts to be utilized as a water supply; [10-15-97]

AH. "hazard to public health" means the indicated presence in water or soil of biological, chemical or other contaminants under such conditions that could adversely impact human health, including without limitation surfacing liquid waste, damage to a domestic water supply source, presence of an open cesspool or tank, or exposure of liquid waste or septage in a manner that allows transmission of disease; [10-15-97]

10-15-97 5:00

AI. "holding tank" means a watertight tank designed to receive and retain liquid waste for periodic pumping and disposal off-site; [10-15-97]

AJ. "imminent hazard to public health or safety" means any situation with the potential to immediately and adversely impact or threaten public health or safety. [10-15-97]

AK. "impervious formation" means any soil or rock formation with a percolation rate slower than 120 minutes per inch; [10-15-97]

AL. "interstitial water" means water in spaces between solid earth particles; [10-15-97]

AM. "limiting layer" means an impervious formation or soils with a percolation rate faster than 5 minutes per inch; [10-15-97]

AN. "liner" means a manufactured or naturally occurring substance which restricts seepage to no more than 0.5 acre-foot per year per acre (0.01 gallons per day per square foot or 4.8×10^{-7} cm/sec.) over the design service life of the lined unit. Manufactured liners must have a minimum thickness of 20 mils; [10-15-97]

AO. "liquid waste" means grey water or blackwater which may contain without limitation human excreta and water carried waste from typical residential plumbing fixtures and activities, including, but not limited to, wastes from toilets, sinks, showers, baths clothes- and dish-washing machines, and floor drains. Specifically excluded from the definition of liquid waste are commercial process wastewaters, roof drainage, mine or mill tailings or wastes, and wastes containing high concentrations of stabilizing or deodorizing agents; [10-15-97]

AP. "liquid waste treatment unit" means a watertight unit designed, constructed and installed to separate and retain solids and to stabilize liquid waste and includes, but is not limited to, aerobic liquid waste treatment units and septic tanks; [10-15-97]

AQ. "load" or "loading" means:

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1. In the context of the biological or chemical load received by an on-site liquid waste system, the amount of material applied to an on-site system liquid waste component per unit area or unit volume;

2. In the context of the structural load applied to an on-site liquid waste structural component, the structural force applied to a liquid waste system component per surface area;

[10-15-97]

AR. "lot" means a unified parcel where liquid waste will be generated or disposed, excluding roadways and roadway easements, legally recorded or validated by other means. "Lot" includes any contiguous parcel subject to a legally recorded perpetual easement which dedicates the servient parcel for the disposal of liquid waste generated on the dominant parcel; [10-15-97]

AS. "modify" means:

1. to change the method of on-site liquid waste treatment or disposal;

2. to expand the on-site liquid waste system;

3. to alter the horizontal or vertical location of the on-site liquid waste system;

4. to increase the amount of design flow or load received by the on-site liquid waste system above the original design flow or load;

5. to remove or replace component materials in a disposal system; or

6. to change the size or boundaries of a lot with an existing on-site liquid waste system so that the total design flow for the lot exceeds the total design flow limitation provided by the formula in Subsection 302.C.1. of this Part;

[10-15-97]

AT. "new and innovative technology" means without limitation

1997 SEP -11 PM 5:00

liquid waste treatment technology, processes, equipment or components which are not fully proven in the circumstances of their intended use, but, based upon documented research and demonstration, appear to offer benefits which outweigh the potential risks of failure. New and innovative technology must be significantly different from technology recognized and allowed by the New Mexico Design Standards and must offer potential benefits in terms of public health, the environment, or energy or resources conservation; [10-15-97]

AU. "New Mexico Design Standards" means Subpart IV of this Part, the Uniform Plumbing Code, and those specifications and construction standards for on-site liquid waste systems promulgated by the Environmental Improvement Board for general use. In the event of conflict between the requirements of the Uniform Plumbing Code and other requirements contained in the New Mexico Design Standards, the more stringent requirements shall apply; [10-15-97]

AV. "nitrate nitrogen" or " NO_3 " means the most highly oxidized form of nitrogen found in wastewater or effluent; [10-15-97]

AW. "off-site water" means that the domestic water supply for the lot is from:

1. a private water supply source which is neither within the lot nor outside the lot within one hundred (100) feet of the property line of the lot; or

2. a public water supply source which is not within the lot;

[10-15-97]

AX. "on-site" means located on or within a lot; [10-15-97]

AY. "on-site liquid waste system" means a liquid waste system, or part thereof, serving a dwelling, establishment or group, and using a liquid waste treatment unit designed to receive liquid waste followed by either a soil treatment or other type of disposal system. On-site liquid waste systems include enclosed systems and privies but do not include systems or facilities designed to receive or treat mine or mill tailings

or wastes; [10-15-97]

AZ. "on-site water" means that the domestic water supply for the lot is from:

1. a private water supply source which is within the lot or within one hundred (100) feet of the property line of the lot; or

2. a public water supply source which is within the boundaries of the lot;

[10-15-97]

BA. "owner" means any person who owns an on-site liquid waste system or any component thereof, or any lot upon which any on-site liquid waste system or any component thereof is located; [10-15-97]

BB. "percolation rate" means the rate of entry of water into soil as determined by a standard soil test at the depth and location of the proposed soil disposal system; [10-15-97]

BC. "Permittee" means any owner of a permitted on-site liquid waste system; [10-15-97]

BD. "person" means any individual, partnership, firm, public or private corporation, association, trust, estate, the state or any political subdivision or agency, or any other legal entity or their legal representative, agents or assigns; [10-15-97]

BE. "primary treatment" means a liquid waste treatment process that takes place in a treatment unit and allows those substances in wastewater that readily settle or float to be separated from the water being treated; [10-15-97]

BF. "private water supply source" means a water supply source such as a well, spring, infiltration gallery, or surface water withdrawal point used to provide water to a water supply system, if such system does not have a least fifteen (15) service connections and does not serve an average of twenty-five (25) individuals at least sixty (60) days out of the year; [10-15-97]

1997 SEP -9 PM 5:00

BG. "privy" or "outhouse" means a receptacle for non-liquid-carried human excreta allowing direct discharge to the soil; [10-15-97]

BH. "public water supply source" means a water supply source such as a well, spring, infiltration gallery, or surface water intake structure used to provide water to a public water supply system for human consumption if the system served has at least fifteen (15) service connections or regularly services an average of twenty-five (25) individuals at least sixty (60) days out of the year; [10-15-97]

BI. "residential unit" means a dwelling; [10-15-97]

BJ. "replacement area" means an area within a lot designated to allow future construction of a replacement disposal area as required by Section 401.C of this Part; [10-15-97]

BK. "roadway" means the surface area of land dedicated by easement or use to provide vehicular passage serving more than one lot or more than five residential or commercial units on a single property; [10-15-97]

BL. "seasonal high ground water table" means the highest level to which the upper surface of ground water may be expected to rise within twenty-four (24) consecutive months ; [10-15-97]

BM. "seasonal high water flow" means the highest level which perennial or intermittent surface waters may be expected to rise within twenty-four (24) consecutive months; [10-15-97]

BN. "secondary treatment" means a wastewater treatment process used to convert dissolved or suspended materials into a form more readily separated from the water being treated. The process is commonly a biological treatment process followed by settling and clarification. The minimum secondary treatment standards required by this Part for the 5-day Biochemical Oxygen Demand (BOD5) and Total Suspended Solids (TSS) shall be:

1. The 30-day average shall not exceed 30.0 mg/L.
2. The 30-day average percent removal shall not be less than 85 percent;

[10-15-97]

BO. "Secretary" means the Secretary of Environment or a designated representative; [10-15-97]

BP. "septage" means the residual wastes and water periodically pumped from a liquid waste treatment unit or from a holding tank; [10-15-97]

BQ. "septic tank" means liquid waste treatment units designed to provide primary treatment and anaerobic treatment prior to disposal. [10-15-97]

BR. "setback distance" means the distance measured by a straight horizontal line between the on-site liquid waste system, its designated replacement area, or portion thereof and the object being considered; [10-15-97]

BS. "suitable soil" means a soil, whether naturally occurring or introduced, which will treat the effluent effectively and act as an effective filter and remove organisms and suspended solids prior to the effluent reaching ground water, bedrock or a limiting layer, and which will provide adequate transmission to prevent a failed system. Suitable soils are minimally characterized by percolation rates between five (5) and one hundred twenty (120) minutes per inch; [10-15-97]

BT. "surface application" means the application of disinfected effluent to the ground surface; [10-15-97]

BU. "test hole" means a hole dug in the proposed disposal field area a minimum of seven (7) feet deep and a minimum of two (2) feet wide. The test hole shall be sufficient to examine the soil visually for type, structure, mottling, impervious layers, and other soil characteristics, and to determine the seasonal high water table level. A soil boring may be used to determine the soil characteristics; [10-15-97]

BV. "total design flow" means the sum of design flows for all on-site liquid waste systems and other wastewater discharges on a lot; [10-15-97]

BW. "total nitrogen" or "N_T" means the combined organic

1997 SEP -3 PM 5:00

nitrogen, ammonia, nitrite and nitrate contained in the wastewater or effluent; [10-15-97]

BX. "Uniform Plumbing Code" or "UPC" means the 1991 Uniform Plumbing Code, 14 NMAC 11.3, the 1991 State of New Mexico Plumbing Code and Mechanical Code - Uniform Plumbing Code, 14 NMAC 11.2, and the 1991 State of New Mexico Plumbing Code and Mechanical Code - Uniform Mechanical Code, 14 NMAC 9.2, or the successor versions of each as adopted by the Construction Industries Division of the New Mexico Regulation and Licensing Department and promulgated in the New Mexico Administrative Code; [10-15-97]

BY. "wastewater" means blackwater and greywater; [10-15-97]

BZ. "watercourse" means any surface river, creek, arroyo, draw, canal or wash, or any other channel having definite banks and beds with visible evidence of the flow of water. [10-15-97]

108. INTERPRETATION. The definitions in Section 107 shall be construed so as to achieve the objective of this Part. [10-15-97]

109. ALTERNATIVE RESOURCES. When guidance is sought in areas not covered by this Part, the most recent version of the following resources may provide guidance. In cases where reference to these alternative resources is proposed the Department shall make the final determination of applicability. [10-15-97]

A. The American National Standards Institute (ANSI) Book of Codes; [10-15-97]

B. The American Society for Testing and Materials (ASTM) Testing Manual; [10-15-97]

C. The International Association of Plumbing and Mechanical Officials (IAPMO) Codes; [10-15-97]

D. The National Sanitation Foundation (NSF) Standard 40 and Standard C9; and [10-15-97]

E. EPA Design Manual for Onsite Wastewater Treatment and Disposal Systems.[10-15-97]

110. **AUTHORITY TO DISCONNECT SOURCE OF WATER SUPPLY.** The Department may disconnect the source of water supply to a commercial or dwelling unit that is served by any on-site liquid waste system that has become a failed system and that presents an imminent hazard to public health. This authority includes authority to disconnect power utilities if necessary to disconnect the source of water supply. The Department shall give notice of its actions to the lot owner and the tenants affected.[10-15-97]

111. **TECHNICAL ADVISORY COMMITTEE**

A. The Secretary may appoint a Technical Advisory Committee to assist the Department in an advisory capacity on materials, systems, processes, equipment approvals and technical specification review and approvals.[10-15-97]

B. The Technical Advisory Committee will meet at the discretion of the Department. Recommendations of the Committee regarding matters within the scope of Subsection 111.A will be presented to the Department for review and evaluation. The Department will make the final decision on any recommendation of the Committee.[10-15-97]

112 - 199. **RESERVED**

200. SUBPART II - PROCEDURES

201. LIQUID WASTE SYSTEM PERMITS.

A. No person shall install or have installed a new on-site liquid waste system or modify or have modified an existing on-site liquid waste system, unless that person obtains a permit issued by the Department prior to construction of such installation or modification. [10-15-97]

1. No person shall construct or modify a dwelling on, or transport a dwelling onto, a lot for which an on-site liquid waste system is required unless the Department has issued an on-site liquid waste system permit prior to such construction, modification, or transportation. [10-15-97]

2. No person shall construct, install, repair or modify an on-site liquid waste system unless that person holds a valid contractors license issued by the New Mexico Construction Industries Division, except that a single family residential property owner may construct, install, repair or modify permitted septic tanks and conventional trench or bed disposal fields on his or her own property after obtaining a permit without such a license. [10-15-97]

B. Obtaining a permit from the Department for installation or modification of an on-site liquid waste system does not relieve any person from the responsibility of obtaining any other approval, license or permit required by state, city or county regulations or ordinances or other requirements of state or federal laws. [10-15-97]

C. Any person seeking a permit shall do so by submitting an application to the field office of the Department having jurisdiction for the area where the system is to be installed or modified. The application shall be:

1. made on a form provided by the Department;

2. accompanied by such other relevant information as the Department may reasonably require or that the applicant may consider appropriate; and

1997 SEP -3 PM 5:00

3. signed by the applicant or their authorized representative.

[10-15-97]

D. The Department may require any or all of the following information before a permit is issued for an on-site liquid waste system, or at any time during the construction thereof. [10-15-97]

1. A Site plan, completely dimensioned, showing direction and approximate slope of surface, location of all present or proposed retaining walls, arroyos, canals, irrigation or drainage channels, water supply lines, wells or other water sources, other on-site liquid waste systems, paved areas, roadways, structures, plumbing fixtures in each structure, and location of the proposed liquid waste system and replacement area with relation to lot lines and structures, and to all sources of public water supply located within two-hundred (200) feet. [10-15-97]

2. Sufficient details of construction, materials, and components necessary to assure compliance with the requirements of this Part, including a full description of the complete installation, quality, kind and grade of all materials, equipment, construction, and methods of assembly and installation. [10-15-97]

3. A log of soil formations and ground water level as determined by soil borings or a test hole(s) dug in close proximity to any proposed seepage pit or disposal field, together with a statement of water absorption characteristics of the soil at the proposed site as determined by approved percolation tests. [10-15-97]

E. 1. Except as otherwise provided in Section 201.E.2, the Department shall, within ten (10) working days after receipt of the **completed** application, grant the permit, grant the permit subject to conditions, or deny the permit and shall notify the applicant of the action taken. [10-15-97]

2. If the Department's initial review of the application indicates that the imposition of more stringent requirements may be necessary pursuant to Section 201.F or Section 301.C, the Department may extend the time for the review of the application

1977 SEP -8 (1) 5:00

until twenty (20) working days after receipt of the **completed** application provided that the Department shall notify the applicant of such extension within ten (10) working days after receipt of the **completed** application. [10-15-97]

3. When the permit is granted subject to conditions or denied, the reason for the action shall refer to the appropriate regulation(s) and be given in writing. [10-15-97]

F. If the Department finds that specific requirements in addition to or more stringent than those provided in Subparts III and IV of this Part are necessary to prevent a hazard to public health or the degradation of a body of water, the Department may issue permit conditions with more stringent requirements or additional specific requirements. Such additional or more stringent requirements may apply to system design, siting, construction, inspection, operation and monitoring. [10-15-97]

G. The Department shall deny the permit if the proposed system will not meet the requirements of this Part or the New Mexico Design Standards. [10-15-97]

H. The Department shall maintain a file of all permits issued and denied. The file shall be open for public inspection. [10-15-97]

I. The installation or modification of an on-site liquid waste system shall be in accordance with the permit. Any change from the permitted installation or modification, including a change of contractor, must receive written Department approval prior to implementation. [10-15-97]

J. No person shall operate or use an on-site liquid waste system until the Department has granted final approval of the system after installation or modification of the system is completed. No person shall occupy a newly constructed or transported dwelling for which an on-site liquid waste system is required until the Department has granted such final approval, and, if applicable, until the governmental body with authority to regulate construction has granted an occupancy permit. The Department shall not grant final approval if the system as installed or modified does not meet the requirements of this Part and the New Mexico Design Standards. [10-15-97]

K. The Department may cancel a permit if the installation or modification of the on-site liquid waste system has not been completed within one (1) year after issuance, or if the Department determines that material information in the application is false, incomplete, or inaccurate and that the correct information would have resulted in the Department denying the original application. If a permit is canceled, the Department shall notify the permittee of the decision in writing and the reason for cancellation and appropriate regulations cited. [10-15-97]

202. VARIANCES.

A. Any person seeking a variance from the requirements contained in this Part shall do so by filing a written petition with the field office of the Department having jurisdiction for the area where the system is to be installed. [10-15-97]

B. The petition shall be: [10-15-97]

1. made on a form provided by the Department; [10-15-97]

2. accompanied by relevant documents or materials which the petitioner believes would support the petition; [10-15-97]

3. accompanied by documentation, including addresses, demonstrating that all owners of adjacent property sharing a common border with the lot for which the variance is sought have been notified of the nature of the variance petition, the date of submission of the petition to the Department, the address of the Department field office to which the petition is being submitted, and the time frame for Department action as provided in Subsection 202.C., unless all adjacent properties are more than one thousand (1,000) feet from the on-site liquid waste system for which the variance is sought; [10-15-97]

4. accompanied by such other relevant information as the Department may reasonably require; and [10-15-97]

5. signed by the petitioner or an authorized representative. [10-15-97]

C. The Department shall, after a minimum of ten (10) but not more than twenty (20) working days following receipt of the

completed petition, grant the variance, grant the variance subject to conditions, or deny the variance and shall so notify the applicant and any other person making a written submission concerning the petition. The reason for the Department's action shall be provided in writing and the appropriate regulations cited. [10-15-97]

D. The Department shall deny the variance petition unless the petitioner establishes by clear and convincing evidence that: [10-15-97]

1. the proposed on-site liquid waste system will, by itself or in combination with other on-site liquid waste systems, or other discharges subject to Subpart III of 20 NMAC 6.2, neither cause a hazard to public health or degrade any body of water; and [10-15-97]

2. granting the variance will result in public health and environmental protection equal to or greater than the minimum protection provided by the varianced requirement. [10-15-97]

E. The Department shall maintain a file of all variances granted and denied. The file shall be open for public inspection. [10-15-97]

F. The factors listed below as applicable, shall be considered in evaluating petitions for variances from the principal requirements of Subpart III. This list is illustrative, not exhaustive. Similarly, some of the factors listed within a category may not be important in specific cases. [10-15-97]

1. Lot size requirements (See also Section 302). [10-15-97]

- a. Proposed system discharge.

- (1) Design flow--projected average flows, basis for projection.

- (2) Discharge quality--degree of treatment, separation of black water, and so forth.

- (3) Type of system--trenches, bed, pit, pressure

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distribution, and so forth.

(4) Location and arrangement of discharge in relation to property boundaries.

[10-15-97]

b. Geological factors.

(1) Depth to seasonal high ground water table.

(2) Distance to seasonal high water flow.

(3) Intervening stratigraphy--geological layer composition (sand, clay, rock) and thickness, type and degree of fracture of bedrock, information from well logs.

(4) Presence of any barriers to pollutant movement.

[10-15-97]

c. Hydrological factors.

(1) Ground water flow direction and gradient.

(2) Transmissivity of the aquifer.

(3) Background quality of the ground water.

(4) Thickness of the saturated aquifer.

(5) Projected mixing depth of effluent with groundwater.

(6) Human influences in ground water flow direction and gradient, such as pumping wells, irrigation, and agricultural drains.

[10-15-97]

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d. Miscellaneous additional factors.

(1) Current and future housing density in the area--notably legal limitation.

(2) Potential for future community sewer.

(3) Current and future use of the ground water.

[10-15-97]

2. Setback requirements (See also Section 303).

[10-15-97]

a. Proposed system discharge.

(1) Design flow--projected average and peak flows, and the basis for projection.

(2) Discharge quality--degree of treatment, separation of black water, and so forth.

(3) Type of system--trenches, bed, pit, pressure distribution, and so forth.

(4) Location and arrangement of discharge in relation to all objects in listed in Table 303.1.

[10-15-97]

b. Geological factors.

(1) Depth to seasonal high ground water table.

(2) Distance to seasonal high water flow.

(3) Intervening stratigraphy--geological layer composition (sand, clay, rock) and thickness, type and degree of fracture of bedrock, information from well logs.

(4) Presence of any barriers to pollutant movement.

[10-15-97]

c. Hydrological factors.

- (1) Ground water flow direction and gradient.
- (2) Transmissivity of the aquifer.
- (3) Background quality of the ground water.
- (4) Thickness of the saturated aquifer.
- (5) Projected mixing depth of effluent with groundwater.
- (6) Human influences in ground water flow direction and gradient, such as pumping wells, irrigation, and agricultural drains.

[10-15-97]

d. Factors relating to the setback objects.

- (1) Water supply well construction and protection--sanitary surface seal, casing sealed past first aquifer, depth of solid casing, depth of screen.
- (2) Well pumping rates and projected drawdown.
- (3) Whether the watercourse is losing or gaining with respect to local ground water.
- (4) Potential for future construction of well, canals, and so forth in area.
- (5) Potential for future change in watercourse or lake shore.
- (6) Potential flooding effects.

[10-15-97]

e. Miscellaneous additional factors.

(1) Current and future housing density in the area--notably legal limitation.

(2) Current and future use of the groundwater that could be affected by the proposed system.

[10-15-97]

3. Clearance requirements (See also Section 304).

[10-15-97]

a. Proposed system discharge.

(1) Design flow--projected average and peak flows, and the basis for projection.

(2) Discharge quality--degree of treatment, separation of black water, sand filtration, and so forth.

(3) Type of system--trenches, bed, pit, pressure distribution, and so forth.

(4) Location and arrangement of discharge in relation to all objects in listed in Table 303.1.

[10-15-97]

b. Geological factors.

(1) Depth to seasonal high ground water table.

(2) Distance from seasonal high water flow.

(3) Type of limiting layer and depth to limiting layer.

(4) Intervening stratigraphy--geological layer composition (sand, clay, rock) and thickness, type and degree of fracture of bedrock, information from well logs.

(5) Percolation rates of soils involved.

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(6) Soil chemistry parameters--pH, cation exchange, capacity, and so forth.

(7) Presence of any barriers to pollutant movement.

(8) Possibility of discharge to the surface at terrain breaks, embankments, road cuts, etc.

[10-15-97]

c. Hydrological factors.

(1) Ground water flow direction and gradient.

(2) Transmissivities of the various soils and geological layers involved.

(3) Projected ground water mounding effects--basis for projection.

(4) Background quality of the ground water.

(5) Thickness of the saturated aquifer.

(6) Projected mixing depth of effluent with groundwater.

(7) Human influences in ground water flow direction and gradient, such as pumping wells, irrigation, and agricultural drains.

[10-15-97]

d. Miscellaneous additional factors.

(1) Current and future housing density in the area -- notably legal limitation.

(2) Current and future use of the water that could be affected by the proposed system.

[10-15-97]

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203. APPEALS.

A. Any affected person who is dissatisfied with action taken by the Department on a permit application or variance petition may appeal to the Secretary. The request must be made in writing to the Secretary within fifteen (15) working days after notice of the Department's action has been issued. Unless an appeal is received by the Secretary within fifteen (15) working days after notice to the applicant or petitioner of the Department's action the decision of the Department shall be final.[10-15-97]

B. If an appeal is received within the fifteen (15) working day time limit, the Secretary shall hold a hearing within fifteen (15) working days after receipt of the request. The Secretary shall notify the person who requested the hearing of the date, time, and place of the hearing by certified mail. If the appeal is on a variance petition, the Secretary shall also notify all persons involved under Section 202.B(3) of the hearing date, time and place of the hearing by certified mail.[10-15-97]

C. In the appeal hearing, the burden of proof is on the person who requested the hearing. Where the Department requires standards more stringent than those provided in this Part, the burden of proof of the necessity for the more stringent standards shall be upon the Department.[10-15-97]

D. Appeal hearings shall be held at a place designated by the Secretary in the area where the proposed on-site liquid waste system is to be located, unless other mutually agreed upon arrangements are made. The Secretary may designate a person to conduct the hearing and make a final decision or make recommendations for a final decision. The Secretary's hearing notice shall indicate who will conduct the hearing and make the final decision.[10-15-97]

E. Upon request, the hearing shall be recorded. Recording costs shall be paid by the person who requests the recording.
[10-15-97]

F. In appeal hearings, the rules governing civil procedure and evidence in District Court do not apply. Hearings shall be conducted so that all relevant views, arguments and testimony are

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amply and fairly presented without undue repetition. The Secretary shall allow Department staff and the hearing requestor to call and examine witnesses, to submit written and oral evidence and arguments, to introduce exhibits, and to cross-examine persons who testify. All testimony shall be taken under oath. At the end of the hearing, the Secretary shall decide and announce if the hearing record will remain open and for how long and for what reason it will be left open. [10-15-97]

G. Based upon the evidence presented at the hearing, the Secretary shall sustain, modify or reverse the action of the Department. The Secretary's decision shall be by written order within fifteen (15) working days following the close of the hearing record. The decision shall state the reasons therefor and shall be sent by certified mail to the hearing requestor and any other affected person who requests notice. Appeals from the Secretary's final decision are by Rule 1-075 NMRA 1997. [10-15-97]

204. INSPECTIONS AND SAMPLING. The Department may perform site inspections prior to making a decision on a permit application or variance petition, during construction or modification of the system, and after completion of the system. The Department may require inspection holes to be excavated and documentation to be provided for purposes of determining soil types, percolation rates and soil and water table depths. The Department may collect samples of soil, liquid waste, and water, including water from wells, to determine compliance with this Part. [10-15-97]

205. - 299. RESERVED

300.

SUBPART III - STANDARDS

301. GENERAL REQUIREMENTS.

A. No person shall discharge untreated liquid waste except into a permitted enclosed system, a permitted liquid waste treatment unit, or a public sewer system. No person shall discharge liquid waste or effluent into a cesspool or effluent disposal well. A privy may be used for the disposal of human excreta and toilet paper, but not for the disposal of other liquid wastes. [10-15-97]

B. No person shall discharge effluent from a liquid waste treatment unit except through a permitted liquid waste disposal system or to a public sewer system. No person shall discharge effluent from a liquid waste treatment unit to an effluent disposal well. [10-15-97]

C. No person shall install, have installed, modify or have modified, own, operate, or use an on-site liquid waste system which, by itself or in combination with other on-site liquid waste systems, may cause a hazard to public health or degrade any body of water. [10-15-97]

D. 1. On-site liquid waste systems installed or most recently modified prior to October 15, 1997 shall meet the less stringent of either:

a. the requirements of this Part, or

b. the corresponding requirements of the regulations in effect at the time of the initial installation or most recent modification of the system, whichever is later in time.

2. On-site liquid waste systems modified after October 15, 1997, shall meet the requirements of this Part. or its successor provisions. Replacement components for on-site liquid waste systems shall be of materials prescribed by the New Mexico Design Standards as of the time of replacement. [10-15-97]

E. On-site liquid waste systems installed after October 15, 1997 shall meet the requirements of this Part. [10-15-97]

302. LOT SIZE REQUIREMENTS. The requirements of this section apply to all on-site liquid waste systems which ultimately discharge to the soil, and to evapotranspiration systems. Compliance with the requirements of this section shall be based on the total design flow for the lot. Water conservation devices or demonstrated actual flows shall not be used to reduce the requirements of this section. For the purposes of this Subpart, lot sizes shall be calculated to the nearest hundredth (0.01) acre. [10-15-97]

A. The date of record for a lot shall be considered to be either:

1. the date of legal recording in the county clerk's office or validation by other means associated with the most recent change in lot size or boundaries; or

2. January 31, 1990, for lots in subdivisions if the governmental body or bodies with jurisdiction therein granted final approval after July 31, 1987 and prior to February 1, 1990, and if a subdivision plat was recorded prior to July 1, 1992 in the county clerk's office for the county or counties in which the subdivision is located.

[10-15-97]

B. An on-site liquid waste system, including its replacement area, shall be located wholly on the same lot which is the site of the dwelling or commercial unit served by the on-site liquid waste system. A copy of the recorded deed or easement for the lot shall be submitted with the application for the on-site liquid waste system installation or modification petition.
[10-15-97]

C. 1. On-site liquid waste systems on lots with record dates after February 1, 1990, shall not exceed the total design flow limitation given by the following formula:

Total Design Flow (gallons per day) = Lot Size (acres) x 500 gpd.

[10-15-97]

2. The minimum lot size required for an on-site liquid waste system on a lot with record date after February 1, 1990 is 0.75 acres. [10-15-97]

3. a. The following table 302.1 lists the minimum lot sizes required for typical flow rates for lots with a date of record after February 1, 1990:

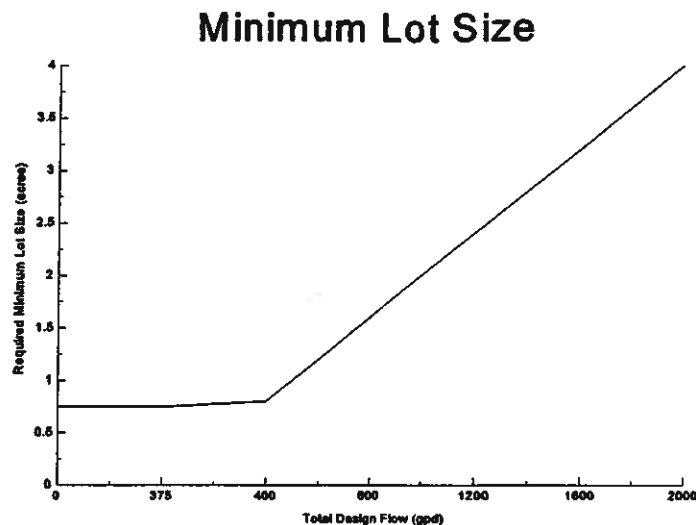
Table 302.1

TOTAL DESIGN FLOW (gallons per day)	MINIMUM LOT SIZE (acres)
375 or less	0.75
450	0.90
600	1.20
750	1.50
1125	2.25
1500	3.00
1875	3.75
2000	4.00

[10-15-97]

b. The following graph (Figure 302.2) illustrates the minimum lot sizes required for any flow rate from zero (0) to two thousand (2,000) gallons per day for lots with a date of record after February 1, 1990:

Figure 302.2



[10-15-97]

D. The total design flow of on-site liquid waste systems initially installed after February 1, 1990, on lots with record dates prior to February 1, 1990, without established on-site liquid waste systems shall not exceed:

1. three hundred seventy-five (375) gallons per day if the lot is smaller than 0.50 acres; or

2. four hundred fifty (450) gallons per day, or the total design flow allowed by the formula in Subsection 302.C.1. above, whichever is greater, if the lot is equal to or larger than 0.50 acres.

[10-15-97]

E. On-site liquid waste systems on lots with record dates prior to February 1, 1990, having any established on-site liquid waste system shall not be modified to increase the total design flow to a flow that exceeds:

1997 OCT -3 PM 5:00

1. three hundred seventy-five (375) gallons per day if the lot is smaller than 0.50 acres; or

2. four hundred fifty (450) gallons per day or the total design flow allowed by the formula in Subsection 302.C.1. above, whichever is greater, if the lot is equal to or greater than 0.50 acres.

[10-15-97]

F. The following table 302.3 summarizes the minimum lot sizes, in acres, in effect prior to February 1, 1990:

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Table 302.3 RECORD DATE									
01/01/60 to 11/01/73		11/01/73 to 09/07/79 *		09/07/79 to 03/01/80		03/01/80 to 11/09/85		11/09/85 to 02/01/90	
Minimum Lot Size	Soil Group **	Min. Lot Size	Total Design Flow (gpd)	Min. Lot Size	Total Design Flow (gpd)	Min. Lot Size	Total Design Flow (gpd)	Min. Lot Size	
O W F A - T S E R I T E **	0.25***	A	0.50	0-1000	0.50	0-375	0.33	0-375	0.33
		B	0.75	1000- 1500	1.00	376- 1000	0.50	376- 750	0.50
		C	1.00	1500- 2000	1.25	1000- 1500	1.00	750- 1125	1.00
		D	****			1501- 2000	1.25	1126- 1500	1.25
								1501- 2000	1.75
O W N A - T S E R I T E **	0.50***	A	0.75	0-1000	0.75	0-1000	0.75	0-375	0.75
		B	1.00	1000- 1500	1.25	1000- 1500	1.25	376- 750	1.50
		C	1.25	1500- 2000	1.70	1501- 2000	1.70	750- 1125	2.00
		D	****					1126- 1500	2.75
								1501- 2000	3.50

*The maximum total design flow was 1,000 gpd for the lot sizes shown.

**See Section 302.G.

***These requirements applied to lots in subdivisions which were required at the time of subdivision to obtain State Health Department review and approval.

****No on-site liquid waste disposal to soil allowed.

NOTE: Roadways were first excluded from figuring lot sizes as of 11/09/85.
[10-15-97]

G. The following table 302.4 lists the soil types for lot size determinations for the period November 1, 1973 to September 7, 1979:

1997 SEP -8 PM 5:00

Table 302.4

SOIL CHARACTERISTICS	A Slight Limitations	B Slight Limitations	C Moderate Limitations	D Severe Limitations
1 SOIL DEPTH (depth to bedrock, in feet)	More than 6 and	More than 6 and	4 - 6 or	Less than 4 or
2 PERCOLATION RATE (rate of percolation of water into soil in minutes per inch)	0 - 15 and	16 - 30 and	31 - 60 or	More than 60 or
3 SEASONAL WATER TABLE (depth to shallowest water table during the year, in feet)	More than 12 and	More than 12 and	4 - 12 or	Less than 4 or
4. SLOPE (incline of the land surface, in percent)	0 - 8 and	0 - 8 and	8 - 25 or	More than 25 or
5 FLOODING POTENTIAL (overflow frequency, in years)	None	None	No more than 1 in 25	More than 1 in 25

The minimum lot size required for the location of an individual liquid waste disposal system is determined by the most limiting soil group under which any soil characteristic falls

[10-15-97]

1. The distinction between "off-site" and "on-site" water, as used in the table in Section 302.F.1, has changed with different versions of the regulations. [10-15-97]

(a) Prior to September 7, 1979, the distinction was between a public community water supply (off-site) and a private, on-site well. [10-15-97]

(b) From September 7, 1979 to November 9, 1985, a "public water supply" (i.e., "off-site") was defined as "a water supply for the provision to the public of piped water for human consumption if such system has at least fifteen (15) service connections or regularly services an average of twenty-five (25) individuals at least sixty (60) days out of the year." A "private water supply" (i.e., "on-site") was defined as "a non-public water supply." [10-15-97]

(c) Between November 9, 1985 and February 1, 1990, the following definitions were in place:

(1) "Off-site water" means that the domestic water supply for the lot is from: 1) a private water supply source which is neither within the lot nor within one

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hundred (100) feet of the property line of the lot, or 2) a public water supply source which is not within the lot.

(2) "On-site water" means that the domestic water supply for the lot is from: 1) a private water supply source which is within the lot or within one hundred (100) feet of the property line of the lot, or 2) a public water supply source which is within the boundaries of the lot.

[10-15-97]

H. When there is insufficient lot area or improper soil conditions for adequate on-site liquid waste disposal for the buildings or land use proposed, and the Department so finds, no on-site liquid waste system permit shall be issued until geological data, engineering data, test reports satisfactory to the Department, and a variance petition have been submitted and approved. [10-15-97]

303. SETBACK REQUIREMENTS.

A. On-site liquid waste systems shall be located to meet setback distances, in feet, specified in the following Table 303.1.

Setback distances apply to any part of the on-site liquid waste system and its designated replacement area.

1997 SEP -01 11:50:01

Table 303.1 Minimum Setback and Clearance Requirements

From:	To:	Building Sewer	Treatment Unit*	Disposal Field	Seepage Pit
Property Lines		clear	5 ft.	5 ft.	8 ft.
Building or Structure		2 ft.	5 ft.	8 ft.	8 ft.
Trees		--	10 ft.	10 ft.	10 ft.
Distribution Box		--	--	5 ft.	5 ft.
Disposal Field		--	10 ft.	4 ft****	10 ft.
Seepage Pit		--	5 ft.	5 ft.	12 ft.
Drinking Water Line					
- Private		1 ft.	10 ft.	10 ft.	10 ft.
- Public		10 ft.	10 ft.	10 ft.	10 ft.
Drinking Water Source/Well					
- Private		50 ft.	50 ft.	100 ft.	100 ft.
- Public		50 ft.	100 ft.	200 ft.	200 ft.
Irrigation Well		50 ft.	50 ft.	100 ft.	100 ft.
Lined Canals		--	10 ft.**	10 ft.**	10 ft.**
Unlined Canals		--	15 ft.**	25 ft.**	25 ft.**
Arroyos		--	15 ft.**	25 ft.**	25 ft.**
Other Watercourses		--	50 ft.	100 ft.	100 ft.
Lakes		--	50 ft.	100 ft.	100 ft.
Seasonal High Water Table, Bedrock & other impervious layers***					
		--	--	4 ft. to bottom of system	4 ft. to bottom of system

* Applies to privy pits, enclosed systems, other liquid waste treatment units

** Plus depth of channel

*** Unlined privy pits shall provide clearance of at least 4 feet

**** Plus 2 feet for each additional foot of depth in excess of 1 foot below perforated pipe

[10-15-97]

B. Setback distances to watercourses, canals and arroyos shall be measured from the edge of the seasonal high water flow to the on-site liquid waste system component. Setback distances to artificially controlled lakes or reservoirs shall be measured from the closest projected shoreline at the maximum controlled water level. [10-15-97]

304. CLEARANCE REQUIREMENTS.

Seasonal high ground water levels and seasonal high water flows shall be determined by the Department either by direct

observation or by reliance upon the findings of a geohydrologist, the U. S. Soil Conservation Service, the U. S. Bureau of Reclamation, or other source acceptable to the Department. The Department may adjust the measured water table to compensate for factors such as season, drought, irrigation or flooding. Compliance with seasonal high ground water table and seasonal high water flow clearances in this section shall be based on the best documented evidence available to the Department at the time of installation or modification.[10-15-97]

A. No on-site liquid waste system shall discharge liquid waste into the soil where the vertical clearance to seasonal high ground water table, impervious or other limiting layer is less than four (4) feet.[10-15-97]

B. Unlined privy pits shall provide a clearance of no less than four (4) feet to the seasonal high ground water table, the seasonal high water flow, impervious formation or other limiting layer.[10-15-97]

305. HOLDING TANK REQUIREMENTS.

A. Non-discharging holding tanks shall not be installed after February 1, 1990, to serve any design flow greater than three hundred-seventy-five (375) gallons per day, except to replace an existing holding tank. Total design flow on any property served by a holding tank installed after February 1, 1990, shall not exceed 375 gallons per day.[10-15-97]

B. Holding tanks shall be constructed of the same materials and by the same procedures to the same standards as described in Section 402 except that they shall have no discharge outlet.
[10-15-97]

C. All holding tank installations shall be tested on site for water tightness. Holding tanks shall be filled with water to the point of overflow at least twenty-four (24) hours prior to inspection. There shall be no signs of external leakage or tank deformation at the time of inspection.[10-15-97]

D. The minimum size of a holding tank shall be 1000 gallons or four (4) times the design flow, whichever is greater. For commercial units the minimum tank size shall be five (5) times the

design flow.[10-15-97]

E. Holding tanks shall be located in an area readily accessible to a pump vehicle under all weather conditions and where accidental spillage during pumpage will not create a nuisance or a hazard to public health. Any spillage that may occur during tank pumpout shall be cleaned up immediately and the spill area disinfected with a sodium or calcium hypochlorite solution.
[10-15-97]

F. Holding tanks shall be protected against flotation under high ground water conditions by weight of tank (ballasting), earth anchors, or by surface or shallow installation.[10-15-97]

G. Holding tanks shall be equipped with a visible and audible high water alarm system. The alarm shall be set to activate at 80% of the tank capacity.[10-15-97]

H. The owner of a holding tank periodically shall have the tank pumped and the liquid waste (septage) properly disposed of in compliance with all applicable laws and regulations as needed to prevent discharge from the tank. Owners of holding tanks shall maintain records demonstrating sufficient pumping and proper disposal of septage from the units to prevent discharge. Copies of pumping and disposal records shall be retained by the owner for at least one year, and shall be made available to the Department for inspection on request. The records shall be:

1. kept on a form provided by the Department if requested;

2. accompanied by such other documentation as the Department may reasonably require;

3. signed by the lot owner or an authorized representative; and

4. mailed on a semi-annual basis, or a schedule otherwise determined by the Department, to the Department field office having jurisdiction.

[10-15-97]

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I. No person shall install, operate, modify, or maintain a holding tank which allows discharge to the soil. [10-15-97]

J. The Department may perform site inspections periodically to ensure that a holding tank does not discharge.
[10-15-97]

K. All dwellings or commercial units served by a holding tank shall be connected to a public or private wastewater treatment plant and the holding tank properly abandoned within 180 days after the installation within two-hundred (200) feet of the lot of a collection line for the wastewater treatment plant. [10-15-97]

306. ALTERNATIVE SYSTEMS. The Department may issue a permit, on an individual basis, for the installation of an alternative on-site liquid waste system, including a system employing new and innovative technology, if the permit applicant demonstrates that the proposed system, by itself or in combination with other on-site liquid waste systems, will neither cause a hazard to public health nor degrade a body of water, and that the proposed system will provide a level of treatment at least as effective as that provided by on-site liquid waste systems, except privies and holding tanks, that meet the requirements of this Part and the New Mexico Design Standards. [10-15-97]

A. In making this determination, the Department may require the submission of plans bearing the seal of a Registered Professional Engineer, or field and test data from the lot for which the alternative system is proposed or from conditions similar to those at the proposed lot, or such additional data as may be necessary to provide a reasonable basis for determining that the system will produce continuous and long-range, trouble-free results at the proposed lot. [10-15-97]

B. If the Department requires a field demonstration of a proposed alternative system utilizing new and innovative technology, the field demonstration shall meet the following requirements.

1. Conditions for installation, operation, maintenance, and monitoring at the proposed demonstration site shall first be determined by the Department.

1997 SEP -01 11 5:01

2. On-site testing and evaluation, as required by the Department and paid for by the permit applicant or variance petitioner, shall be performed over a period of one (1) year from start-up of the system.

3. A contingency plan shall be included to provide liquid waste treatment that meets the requirements of this Part if the demonstration results in a failed system.

[10-15-97]

307. SEPTAGE. Septage shall be disposed of so that it will not cause a hazard to public health and so that it will not degrade a body of water. Disposal of septage may also be subject to the New Mexico Water Quality Control Commission Regulations and other federal, state and local requirements. [10-15-97]

308. OPERATION REQUIREMENTS.

A. No person shall introduce motor oil, gasoline, paint, varnish, solvents, pesticides, fertilizer, or other materials of a composition or concentration not generally considered liquid waste to an on-site liquid waste system. [10-15-97]

B. No person shall introduce any chemical defined by the New Mexico Water Quality Control Commission as a toxic pollutant into an on-site liquid waste system. [10-15-97]

309. MAINTENANCE OF ON-SITE LIQUID WASTE SYSTEMS

A. The owner of an on-site liquid waste system shall operate and maintain the system according to the recommendations of the manufacturer or installer of the system. [10-15-97]

B. Liquid waste treatment additives shall not be used as a means to reduce the frequency of proper maintenance and removal of septage from a treatment unit. [10-15-97]

310. - 399. RESERVED

400. SUBPART IV - DESIGN**401. GENERAL**

A. The type of on-site liquid waste system shall be determined on the basis of location, lot size, soil and site characteristics, seasonal high water table or other impervious formations or limiting layers and shall be designed to receive all design flows from the property. The system, except as otherwise approved, shall consist of a liquid waste treatment unit and associated disposal system. [10-15-97]

B. Where the design flow or the quality of the liquid waste or effluent is such that the above system cannot be expected to function satisfactorily, the method of liquid waste treatment and disposal shall be first approved by the Department. On-site liquid waste systems for minor, limited, or temporary uses shall be first approved by the Department. [10-15-97]

C. All disposal systems that utilize subsurface discharge and soil absorption shall be designed so that additional seepage pits, drain fields, or other subsurface absorption areas equivalent to at least 100% of the required original disposal system, may be installed if the original system cannot absorb all the liquid waste. No division of a lot or construction or remodeling of a permanent structure on the lot shall be made if such division, construction or remodeling impairs the usefulness of the 100% replacement area. [10-15-97]

D. Nothing contained in this Subpart IV shall be construed to prevent the Department from requiring compliance with more stringent requirements than those contained herein, where the Department finds that such more stringent requirements are necessary to prevent a hazard to public health or the degradation of a body of water. [10-15-97]

402. LIQUID WASTE TANK DESIGN AND CONSTRUCTION

A. **General.** All treatment units, and tanks, regardless of material or method of construction, shall:

1. be watertight;
2. be installed level on undisturbed or compacted soil;
3. be designed and constructed to withstand all potential lateral earth pressures under saturated soil conditions with the tank empty;
4. have a minimum live load at the surface of 300 pounds per square foot with twelve (12) inches of cover unless heavier

1997 SEP -8 PM 5:01

loads are expected;

5. not be subject to corrosion or decay;
6. have the manufacturer's name, New Mexico registration number, year of construction, model number and tank capacity in gallons permanently displayed on the tank above the outlet pipe;
7. not be constructed or manufactured on site in the ground when saturated soil conditions during construction are closer than three (3) inches to the bottom of the excavation;
8. be protected against flotation under high ground water conditions;
9. be installed so that they are easily locatable; and
10. be approved by the International Association of Plumbing and Mechanical Officials (IAPMO) or meet IAPMO minimum standards as demonstrated to the Department by approved laboratory testing and certification by a registered Professional Engineer.

[10-15-97]

B. The minimum liquid capacity of a septic tank shall be determined using the following Table 402.1 based on the number of bedrooms, or the number of plumbing fixture units, whichever yields a larger minimum tank capacity, or using the formulae in paragraphs 402.B.1. and 402.B.2. below based on the estimated liquid waste design flow rate.

1027 SEP -0 11:5:01

Table 402.1**Capacity of Septic Tanks**

Single Family dwellings, number of bedrooms	Other Uses - Maximum Fixture Units* Served	Minimum septic tank capacity in gallons
1	10	750
2 - 3	10	1000
4	15	1200
5 - 6	20	1500
7 - 9	27	2000
	29	2250
	32	2500
	35	2750
	39	3000
	42	3250
	45	3500

* Extra fixture units over 100, 25 gallons per fixture unit; Fixture units less than 100, approximately equal to 31.1 gallons per fixture unit.

[10-15-97]

1. Flows 1500 gpd or less -- $2.5 \times \text{Design Flow} = \text{tank capacity}$. [10-15-97]

2. Flows greater than 1500 gpd -- $0.75 \times \text{Design Flow} + 1125 = \text{tank capacity}$. [10-15-97]

3. The design flow rates for the commercial unit usage set forth in the following Table 402.2 shall be used for determining liquid capacities for on-site liquid waste systems.

1987 SEP -8 PM 5:01

Table 402.2

Established Liquid Waste Design Flow Rates

TYPE OF OCCUPANCY		(GPD)	TYPE OF OCCUPANCY		(GPD)
1.	Airport	20 per employee 5 per passenger	9.	Institutions (resident) Rest Homes	125 per person
2.	Bowling alleys (Snack bar only)	75 per lane	10.	Laundries, self-service (minimum 10 hours/day) Commercial	50 per wash cycle per manufacturer's specifications
3.	Bed & Breakfast	150 first bedroom 100 each additional bedroom	11.	Offices	20 per employee
4.	Camps: campground with central comfort station with flush toilets, no showers Day camps (no meals served) Summer & Seasonal	35 per person 25 per person 15 per person 50 per person	12.	Parks: picnic park - toilets only recreation vehicles without water hookup with water & sewer hookup	20 per parking space 75 per space 100 per space
5.	Churches (Sanctuary) with kitchen waste	5 per seat 7 per seat	13.	Restaurants - cafeterias toilet kitchen waste for garbage disposal add for cocktail lounge add kitchen waste - disposable service	20 per employee 7 per customer 6 per meal 1 per meal 2 per customer 2 per meal
6.	Dance Hall	5 per person	14.	Schools - Staff & Office Elementary & Day care Intermediate & High Boarding, total waste	20 per person 15 per student 20 per student 100 per person
7.	Factories: no showers with showers Cafeteria, add	25 per employee 35 per employee 5 per employee			
8.	Hotels, Motels, Lodges Lounges & restaurants calculated separately	60 per bed			
9.	Institutions (resident) Nursing Homes	75 per person 125 per person			

STATE OF NEW MEXICO
1977 SEP -0 11 5:01

14.	Schools, con't gym & showers, add	5 per student	16.	Stores	20 per employee
	with cafeteria, add	3 per student		public restrooms,	1 per 10 sq ft.floor
15.	Service stations and Convenience Stores	400 per Toilet	17.	Swimming pools, public	10 per person
	uni-sex restrooms	800 per Toilet	18.	Theaters, auditoriums	5 per seat
				Drive-ins	10 per space

Liquid waste flows determined by meters or other
measuring devices shall be multiplied by 1.5 safety factor
for peak design flow.

[10-15-97]

C. Plans for all septic tank design shall be submitted to the Department for approval, registration and certification. Such plans shall show all dimensions, reinforcement, structural calculations, and such other pertinent data as may be required by the Department. All tanks must be IAPMO approved or meet minimum IAPMO standards as demonstrated to the Department by approved laboratory testing and certification by a registered Professional Engineer. Minimum standards for non-IAPMO approved tanks include but are r limited to: [10-15-97]

1. Septic tanks shall be designed to produce a clarified effluent and shall provide adequate space for sludge and scum accumulations. [10-15-97]

2. Septic tanks shall be constructed of solid durable materials not subject to excessive corrosion or decay and shall be watertight. [10-15-97]

a. Septic tanks may be constructed of the following materials:

- 1) precast reinforced concrete;
- 2) poured-in-place concrete;
- 3) fiberglass;
- 4) polyethylene; or
- 5) other materials as approved in writing by the Department.

[10-15-97]

b. Metal or wooden tanks are prohibited. [10-15-97]

3. Septic tanks shall have a minimum of two (2) compartments. The inlet compartment of a septic tank shall be two-thirds (2/3) of the total

1977 SEP -3 PM 5:01

capacity of the tank, but not less than five-hundred (500) gallons liquid capacity, and shall be at least three (3) feet in width and five (5) feet in length. Liquid depth shall be not less than two (2) feet and six (6) inches nor more than six (6) feet. The second compartment of a septic tank shall have a capacity of one-third (1/3) of the total capacity of such tank. In septic tanks having over fifteen hundred (1500) gallons capacity, the second compartment may not be less than five (5) feet in length. [10-15-97]

4. Access to each septic tank shall be provided by at least two (2) manholes, each of which shall be at least twenty (20) inches in minimum dimension, or by an equivalent manhole slab. One (1) manhole shall be placed over the inlet and one (1) manhole shall be placed over the outlet. Whenever a first compartment exceeds twelve (12) feet in length, an additional manhole shall be provided over the baffle wall. Each manhole shall be extended to within one foot of the surface of the ground. These extensions shall be twenty-four (24) inches in diameter with an approved lid that conforms to Section 402.C.10 of this Part. If the extensions are made of concrete they shall be coated with a "Foundation Grade" bituminous coating approved by the Department. "Wet-or-Dry" coatings and mastics, or other water-based materials are not acceptable. [10-15-97]

5. The inlet and outlet pipe openings shall be not less in size than the connecting sewer pipe. The vertical leg of round inlet and outlet fittings shall not be less in size than the connecting sewer pipe nor less than four (4) inches. A baffle type fitting shall have the equivalent cross-sectional area of the connecting sewer pipe and not less than a four (4) inch horizontal dimension when measured at the inlet and outlet pipe inverts. [10-15-97]

6. The inlet and outlet pipe or baffle shall extend at least four (4) inches above and at least twelve (12) inches below the water surface. The invert of the inlet pipe shall be at a level not less than two (2) inches above the invert of the outlet pipe. [10-15-97]

a. Inlet and outlet pipe or baffles shall be of cast iron, schedule 40 PVC, ABS, or cast-in-place concrete. [10-15-97]

7. Inlet and outlet pipe fittings or baffles, and compartment partitions, shall have a free vent area equal to the required cross-sectional area of the building sewer or private sewer discharging into the septic tank provide free ventilation above the water surface from the disposal field or seepage pit through the septic tank, building sewer, and stack to the outer air. [10-15-97]

8. The sidewalls shall extend at least nine (9) inches above the liquid depth. The cover of the septic tank shall be at least two (2) inches above the back vent openings. [10-15-97]

9. Partitions or baffles between compartments shall be of solid, non-corrosive, durable material and shall extend at least four (4) inches above the water level. An inverted fitting equivalent in size to the tank

STATE OF NEW MEXICO
OFFICE OF THE ATTORNEY GENERAL
107-000-0000

inlet, but in no case less than four (4) inches in size, shall be installed in the inlet compartment side of the baffle with the bottom of the fitting placed midway in the depth of the liquid. Metal or wooden baffles are prohibited. [10-15-97]

10. Each tank shall be structurally designed to withstand all anticipated earth or other loads. All septic tank covers shall be capable of supporting an earth load of not less than three hundred (300) pounds per square foot when the maximum fill coverage does not exceed three (3) feet. [10-15-97]

a. Concrete Septic Tanks, Monolithic precast [10-15-97]

(1) Minimum concrete thickness and reinforcement.

(a) Walls: Two and one-half (2 1/2) inches in thickness with 6 x 6 by 10 x 10 Remesh, three thousand (3000) pounds per square inch (psi), air entrained.

(b) Floors: Three (3) inches in thickness with 6 x 6 by 10 x 10 Remesh, Three thousand (3000) psi, air entrained.

(c) Covers: Three (3) inches in thickness with 6 x 6 by 10 x 10 Remesh, Three thousand (3000) psi air entrained and No 4. Rebar spaced at one (1) foot intervals across the width of tank.

(d) Unreinforced concrete shall be at least five (5) inches thick and have a compressive strength equal to that required by (a), (b) and (c) above.

[10-15-97]

(2) Floors must be an integral part of the tank. [10-15-97]

(3) Where sections are used, tongue and groove joints or keyways shall be used and shall be sealed with an approved sealer. [10-15-97]

(4) Poured in place tanks must be designed and certified by a New Mexico Registered Architect or Professional Engineer. [10-15-97]

b. Concrete Block, Minimum thickness and reinforcement [10-15-97]

(1) Walls: Eight (8) inch block filled with concrete and sealed internally with an approved sealer. Wall shall be tied to the floor at each wall joint with No. 4 Rebar. [10-15-97]

(2) Floors: Minimum four (4) inches thickness with 6 x 6 by 10 x 10 Remesh and twelve (12) No. 4 Rebar, with one (1) bar eight (8) inches from each side of each corner, with at least ten (10) inches embedded in the floor with a ninety (90) degree bend and extending at least ten (10)

1997 SEP -8 PM 5:01

inches into the wall.[10-15-97]

(3) Covers: Minimum five (5) inches thickness with 6 x 6 by 10 x 10 Remesh, three thousand (3000) psi, air entrained.[10-15-97]

c. Fiberglass, Reinforced plastic [10-15-97]

(1) The septic tank shell, including the ends, shall have a minimum thickness of three-sixteenths inch (0.188").[10-15-97]

(2) Each access and inspection hole cover shall have approved fasteners not subject to deterioration by liquid or gases normally present in septic tank systems to assure that the covers will remain in place. All covers shall overlap the hole by a minimum of two (2) inches in all directions.[10-15-97]

(3) Each tank shall be free from visual defects such as foreign inclusions, dry spots, air bubbles, pimples and delamination. The inner and outer surfaces shall have a smooth, continuous finish with no exposed fibers. Both the inner and outer surfaces shall have a continuous resin rich surface and no fibers shall be exposed either directly from cracks, porosity or holes, or indirectly through bubbles that may break and expose fibers.[10-15-97]

(4) Each tank shall be constructed of reinforced polyester or other approved resin. Reinforcement may be fiberglass woven fabric, chopped strand mat, loose filament, roving or rope. Fiberglass reinforcement shall be treated with a coupling agent that will provide a compatible bond between the resin and the fiberglass. There shall be no less than thirty (30) percent (%) fiberglass reinforcement material and no less than seventy (70) percent (%) resin by weight used in the construction of each tank. The use of filler material shall not exceed thirty (30) percent (%) by weight.

(a) Manufacturer's data sheets covering all characteristics and properties of the resin, catalyst and fiberglass reinforcement material used in tank construction shall be provided to the Department.

(b) Complete information on the type of filler material used in tank construction shall be provided to the Department.

(c) The percentages, by weight, of resin, reinforcement and filler incorporated into the septic tanks shall be provided to the Department.

[10-15-97]

(5) The completed tank shall be watertight below the high water level and shall remain watertight under the maximum conditions of stress produced under the loads described in 402.C.10.d below.[10-15-97]

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107 01-10 11 5:01

d. Each tank shall be so constructed that the following requirements will be met. All tests are to be conducted with the tank at temperature between sixty-five (65) and eighty (80) degrees Fahrenheit. [10-15-97]

(1) The Barcol hardness of tanks shall be no less than thirty-five (35) units and no more than fifty-five (55) units determined by use of a "Barcol Impressor" (Barber Colman Model GYZJ 934-I or equivalent) following the procedures set forth in ASTM - 2583 including any revisions. [10-15-97]

(2) There shall be no permanent distortion or failure when tanks are sealed and evacuated to a vacuum of V inches of mercury, where V is equal to the maximum depth of earth cover in feet recommended by the manufacturer but not less than three (3) feet. [10-15-97]

(3) There shall be no permanent distortion or failure when tanks are statically loaded in accordance with the following procedure: Bed the top of an empty tank in dry sand to a depth not exceeding four (4) inches below ground level. The tank shall be oriented as for service. Determine the maximum cross-section area and load the top segment of the tank with sand bags to a total weight in pounds equal to: $420 \times A$, where A is the plan cross-section in square feet. The bags should be distributed as uniformly as possible over the tank surface above the plane of maximum area, with the exception of the manhole, which shall be left unloaded. [10-15-97]

e. A representative number, as determined by the Department of tanks delivered shall be tested as specified above. A statement certifying the gross weight of each tank tested shall be included with the results of each tank tested. Testing shall be accomplished by an approved materials testing laboratory, and all test results shall be certified by a registered professional engineer. No tank delivered shall differ in gross weight by more than plus ten (+10) or minus five (-5) percent (%) from the weight of tanks which have been subjected to the testing required above. [10-15-97]

f. Fiberglass or plastic tanks shall be installed according to the manufacturer's instructions. A copy of the manufacturer's installation instructions shall be available for inspection by the Department at the installation site. Fiberglass or plastic tanks shall be installed level on a minimum of four (4) inches of 3/4 inch gravel bed. The sides of the tank shall be bedded with at least six (6) inches of sand. [10-15-97]

11. Septic tanks installed under concrete or blacktop paving shall have the required manholes accessible by extending the manhole openings as described in paragraph C.4 above to grade in a manner acceptable to the Department. [10-15-97]

D. Materials. All tanks must be IAPMO approved or meet minimum IAPMO standards as demonstrated to the Department by approved laboratory testing and certification by a registered Professional Engineer. Minimum standards include but are not limited to the following minimum specifications:

1007 SEP -2 PM 5:01

1. Concrete Septic Tanks. All concrete septic tanks shall be protected from corrosion by coating internally with an approved bituminous coating or by other acceptable means. The coating shall extend to at least six (6) inches below the waterline and shall cover all of the internal area, including inlets, outlets, and baffles, above that point. Tank construction materials shall meet the following minimum specifications.

- a. Concrete strength - 3000 psi @ 28 days;
 - b. Cement, Portland Type I or III per ASTM C150-81
 - c. Admixtures per ASTM C233-82
 - d. Reinforcing per ASTM A615 for wire fabric, Grade 40/60
- Density 140 PCF
R'd or equivalent.

[10-15-97]

2. Plastic or Fiberglass Tanks.

a. Ultimate tensile strength - minimum 9,000 psi when tested in accordance with ASTM D 638-89, Standard Method of Test for Tensile Properties of Plastics.

b. Flexural strength - minimum 16,000 psi when tested in accordance with ASTM D 790-86, Standard Method of Test for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

c. Flexural modulus of elasticity - minimum 700,000 psi when tested in accordance with ASTM 790-86, Standard Method of Test for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

[10-15-97]

3. Alternate materials, manufactured, pre-fabricated and owner built tanks may be approved by the Department. Independent laboratory tests and engineering calculations certifying the tank capacity and structural stability shall be provided as required by the Department.

[10-15-97]

E. Pump Stations and Equipment

1. Pump stations or pump chambers shall be watertight and shall 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. [10-15-97]

2. 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 locking removable cover. [10-15-97]

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2015-11-12 PM 5:01

3. Pump stations or pump chambers shall be equipped with both audible and visual alarms for high water and pump failure. All alarm control circuits will be contained in weather proof control boxes or located inside a building or other weather proof structure. Alarms shall be located where they are readily seen and heard by the owner. [10-15-97]

F. Building Sewer

1. The building sewer connects the building drain to the septic tank or liquid waste treatment unit. Horizontal building sewer piping shall be run in practical alignment and a uniform slope of not less than one-fourth (1/4) of an inch per foot or two (2) percent toward the point of disposal provided that where it is impractical due to the structural features or arrangement of any building or structure to obtain a slope of one-fourth (1/4) of an inch or two (2) percent, any such pipe or piping four (4) inches in diameter or larger may have a slope of not less than one-eighth (1/8) of an inch per foot or one (1) percent, when first approved by the Department. [10-15-97]

2. Each horizontal sewer pipe shall be provided with a cleanout at its upper terminal and each run of pipe which is more than one-hundred (100) feet in length shall be provided with a cleanout for each one-hundred (100) feet or fraction thereof. Cleanouts shall be installed per Section 406 (Cleanouts) and Section 1107 (Cleanouts) of the most recently adopted version of the Uniform Plumbing Code (UPC) and the New Mexico Plumbing Code. [10-15-97]

3. Sewer piping shall be cast iron, lead, copper, brass, Schedule 40 ABS DWV (Drain, Waste and Vent), Schedule 40 PVC DWV, extra strength vitrified clay pipe or other approved materials having a smooth uniform bore. Vitrified clay pipe or fittings shall not be used above ground or where pressurized by a pump or ejector. Vitrified clay pipe or fittings shall be a minimum of twelve (12) inches below ground. [10-15-97]

403. AREA OF DISPOSAL FIELD AND SEEPAGE PITS

The minimum required absorption area in a disposal field in square feet, and in seepage pits in square feet of side wall, shall be predicated on the liquid waste design flow rate and shall be determined by either utilizing the following Table 403.1 based on the soil classification of the soil found in the proposed location of the disposal field, or by utilizing the formula specified in Section 404.E based on the results of a standard percolation test as described in Section 404.

Table 403.1

Soil Absorption Areas

Soil Texture	Square Feet Per Gallon Per Design Flow
Coarse Sand	0.83
Fine Sand*	1.67
Sandy Loam	1.27
Loam	1.67
Silty Loam	2.00
Clay Loam	2.20
Clay	4.20

*Soils having 50% or more fine sand plus very fine sand

[10-15-97]

A. When trench disposal fields are installed, a minimum of one hundred and fifty (150) square feet of bottom area shall be provided for each system exclusive of any hard pan, caliche, rock, clay, or other impervious formations. Side wall area in excess of the required minimum of twelve (12) inches and not to exceed thirty-six (36) inches below the leach line may be added to the trench bottom area when computing total absorption areas. The minimum twelve (12) inches of sidewall is part of the total absorption area of the conventional trench and shall not be included in any sidewall calculations. [10-15-97]

B. Where leaching (absorption) beds are permitted in lieu of trenches, the bottom area and absorption area of each such bed shall be at least fifty (50) percent greater than the minimum required absorption area. A minimum of two hundred and twenty-five (225) square feet of bottom area shall be provided for each bed system. Perimeter side wall area in excess of the required minimum of twelve (12) inches and not to exceed thirty-six (36) inches below the leach line may be added to the bed bottom area when computing total absorption areas. The minimum 12 inches of perimeter sidewall area is part of the total absorption area of the bed and is not to be included in any sidewall calculations. [10-15-97]

C. No excavation for an absorption trench, absorption bed or seepage pit shall extend within four (4) vertical feet of the seasonal high groundwater table nor to a depth where effluent may degrade a body of water or the environment. [10-15-97]

D. The minimum effective absorption area in any seepage pit shall be calculated as the excavated side wall area below the inlet pipe exclusive of any hardpan, caliche, rock, clay, or other impervious formations and may be provided in one or more seepage pits. [10-15-97]

404. PERCOLATION TESTS

A. The Department may require that percolation tests be performed and submitted with the permit application. [10-15-97]

B. To determine the absorption qualities of questionable soils other than those listed in Table 403.1, or at the option of the applicant, the proposed site shall be subjected to percolation tests acceptable to the Department. [10-15-97]

C. When a percolation test is performed, no on-site liquid waste system utilizing only primary treatment shall be permitted if that test shows the percolation rate equal to or faster than five (5) minutes per inch or slower than one hundred and twenty (120) minutes per inch. [10-15-97]

D. Percolation test results shall be based upon the average percolation rate from a minimum of two test holes placed fifty feet apart where possible. Whenever the percolation rates determined by the individual tests performed in each of the two test holes vary by more than twenty (20) minutes per inch, a third test performed on a test hole equidistant from the original two test holes shall be performed and the minimum area of the absorption field shall be sized based upon the average of the three test results. Each percolation test shall be performed in the specific area and at the depth in which the absorption field is to be installed. [10-15-97]

1. Percolation test holes shall be dug vertically and shall be four (4) to twelve (12) inches in diameter and as deep as the proposed drainfield bottom. The sides of the test holes shall be scratched to remove any smeared or loose surfaces. Two (2) inches of gravel or sand shall be placed in the bottom of each test hole. [10-15-97]

2. Each test hole shall be saturated with a minimum of twelve (12) inches of water for at least four (4) hours prior to performance of the test. Clay soils shall be saturated for at least twelve (12) hours prior to test. In sandy soils the test may be performed immediately. [10-15-97]

3. The water rate drop shall be determined in the following manner. The hole shall be filled with not less than six (6) inches of water above the gravel and the height measured. The water level shall be measured every ten (10) minutes for a minimum of a one (1) hour period. If the water level drops less than one (1) inch in the first ten (10) minutes, the water level readings shall be measured every thirty (30) minutes over a four (4) hour period. The water shall be replenished as often as necessary but shall not be allowed to drop to less than two (2) inches above the gravel or sand. The times and water level measurements shall be recorded on the Percolation Test Record which may be obtained from the Department upon request. [10-15-97]

4. The percolation rate shall be calculated by dividing the time interval by the inches of water level drop recorded for the last ten (10) or thirty (30) minute test interval. This calculation shall be recorded on the Percolation Test Record. [10-15-97]

1997 SEP -01 11 5:01

E. When a percolation test is utilized, the minimum required sorption area shall be computed using the formula:

Absorption Area (square feet) = square root of percolation test results in minutes per inch times 0.32 times design flow (Q) in gallons per day.

$$AA = \sqrt{t \times 0.32 \times Q}, \text{ where } t = \text{percolation rate}$$

Credit may be allowed for decreasing the absorption area requirements based upon secondary or advanced treatment efficiencies. [10-15-97]

405. DISPOSAL FIELD DESIGN AND CONSTRUCTION

A. Distribution lines shall be constructed of perforated PVC pipe or other approved materials, provided that sufficient openings are available for distribution of the effluent into the trench area. [10-15-97]

B. 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 stone, gravel, slag, or similar aggregate material acceptable to the Department, varying in size from three fourths (3/4) inch to two and one half (2 1/2) inches shall be placed in the trench to the depth and grade required. Glass, limestone, pumice and cinder are not acceptable as aggregate material. Drain lines shall be placed on the aggregate material in an approved manner. The drain lines shall then be covered with aggregate material to a minimum depth of two (2) inches and then covered with untreated building paper, straw, or similar porous material to prevent closure of voids with earth backfill. No earth backfill shall be placed over the aggregate material cover until authorized or approved by the Department. [10-15-97]

C. A grade board staked in the trench to the depth of aggregate material shall be utilized when distribution line is constructed with drain tile or a flexible pipe material which will not maintain alignment without continuous support. [10-15-97]

D. Approved gravelless drainfields materials may be utilized as an alternative to approved drainfields aggregates when installed according to the manufacturer's recommendations. Sizing shall be determined by the Department. [10-15-97]

E. When seepage pits are used in combination with disposal fields, the aggregate material in the trenches shall terminate at least five (5) feet from the pit excavation and the line extending from such points to the seepage pit shall be constructed of approved pipe with watertight joints. [10-15-97]

F. Where two (2) or more drain lines are installed, an approved distribution box of sufficient size to receive lateral lines shall be installed at the head of each disposal field. The inverts of all outlets shall be level and the invert of the inlet shall be at least one (1) inch

above the outlets. Distribution boxes shall be designed to insure equal flow and shall be installed on a level base in natural undisturbed or compacted soil or on a concrete footing.[10-15-97]

1. Concrete distribution boxes shall be coated on the inside with bituminous coating or other approved method acceptable to the Department. [10-15-97]

2. All laterals from a distribution box to the disposal field shall be approved pipe with watertight joints. Multiple disposal field laterals, wherever practicable, shall be of uniform length.[10-15-97]

3. Connections between a septic tank and distribution box shall be laid with approved pipe with watertight joints on natural ground or compacted fill.[10-15-97]

4. When two (2) drain lines are installed, the installer, after approval by the Department, may install in lieu of a distribution box a tee fitting and a distribution header to multiple trenches provided that the tee and header pipe is level.[10-15-97]

G. When more than five-hundred (500) lineal feet of leach line is required, a dosing tank shall be used. Dosing tanks shall be equipped with an automatic pump which discharges the tank a minimum of once every four (4) hours. The tank shall have a capacity equal to at least seventy-five (75) percent of the interior capacity of the pipe to be dosed at one time. When the total length of leachline exceeds one thousand (1000) lineal feet, a dosing tank shall be provided with two (2) pumps dosing alternately and each serving one half (½) of the leach field.[10-15-97]

H. Disposal fields shall be constructed as follows:

	MINIMUM	MAXIMUM
Number of drain lines	1 per field	
Length of each line	-	100 ft.
Bottom width of trench	18 in.	36 in.
Spacing of lines, center to center	4 ft.	6 ft.
Depth of earth cover of lines	12 in.	-
Grade of lines	level	3 in./100 ft.
Aggregate material under drain lines	12 in.	-
Aggregate material over drain lines	2 in.	-

Minimum spacing between trenches or leaching beds shall be four (4) feet plus (2) feet for each additional foot of depth in excess of one (1) foot below the bottom of the drain line. Distribution drain lines in leaching beds

1997 SEP -01 PM 5:01

shall not be more than six (6) feet apart on centers and no part of the perimeter of the leaching bed shall be more than three (3) feet from a distribution drain line. [10-15-97]

I. When necessary, to prevent line slope in excess of 3 inches per 100 feet, absorption trenches or beds shall be stopped. The lines between each horizontal section shall be made with watertight joints and shall be designed so each horizontal trench or bed shall be utilized to the maximum capacity before the effluent shall pass to the next lower trench or bed. The lines between each horizontal absorption section shall be made with approved watertight joints and installed on natural or unfilled ground. [10-15-97]

406. SEEPAGE PIT DESIGN AND CONSTRUCTION

A. The minimum capacity of seepage pits and absorption area shall conform to the requirements of Sections 403 and 404 of this Part. [10-15-97]

B. Multiple seepage pit installations shall be served through an approved distribution box or be connected in series by means of a water tight connection laid on undisturbed or compacted soil. The outlet from each seepage pit shall have an approved vented leg fitting extending at least twelve (12) inches below the inlet fitting. [10-15-97]

C. Each seepage pit shall have an excavated horizontal dimension of not less than four (4) feet. Each such pit shall be lined with approved type whole new hard burned clay brick, concrete brick, concrete circular type cesspool blocks, or other approved materials. [10-15-97]

D. The lining in each seepage pit shall be circular and laid on a firm foundation. Lining materials shall be placed tight together and laid with joints staggered. Except in the case of approved type pre-cast concrete circular sections, no brick or block shall be greater in height than its width and shall be laid flat to form at least a four (4) inch wall. Brick or block greater than twelve (12) inches in length shall have chamfered matching ends and be scored to provide for seepage. Excavation voids behind the brick, block, or concrete liner shall have a minimum of six (6) inches of clean three fourths (3/4) inch gravel or rock. [10-15-97]

E. All brick or block used in seepage pit construction shall have a minimum compressive strength of twenty-five hundred (2500) pounds per square inch. [10-15-97]

F. Each seepage pit shall have a minimum sidewall (not including the arch) of ten (10) feet below the inlet pipe. [10-15-97]

G. The arch, cover or dome of any seepage pit shall be constructed in one of the following three ways:

1. Approved type hard burned clay brick, or solid concrete brick, or block laid in cement mortar.

2. Approved brick or block laid dry.

In both of the above methods, an approved cement mortar covering of at least two (2) inches in thickness shall be applied, said covering to extend at least six (6) inches beyond the sidewalls of the pit.

3. Approved type one or two piece reinforced concrete slab or three thousand (3000) pounds per square inch minimum compressive strength, not less than five (5) inches thick and designed to support an earth load of not less than four hundred (400) pounds per square foot.

[10-15-97]

H. Each such arch, dome or cover shall be provided with a nine (9) inch minimum inspection hole with plug or cover and shall be coated on the underside with an approved bituminous or other nonpermeable protective compound.[10-15-97]

I. The top of the arch, dome or cover must be a minimum of twelve (12) inches but not more than four (4) feet below the surface of the ground. Risers must be provided to extend the arch, dome or cover to within twelve (12) inches of the surface.[10-15-97]

J. An approved vented inlet fitting shall be provided in every seepage pit so arranged as to prevent the inflow from damaging the sidewall. When using a one or two piece concrete slab cover inlet, the inlet fitting may be an approved one fourth (1/4) bend fitting discharging through an opening in the top of the slab cover. On multiple seepage pit installations, the outlet fittings shall meet the requirements of Section 406.B.[10-15-97]

407. SPECIAL LIQUID WASTE DISPOSAL

A. When liquid wastes are discharged containing excessive amounts of grease, garbage, flammable wastes, sand, or other ingredients which may affect the operation of an on-site liquid waste system, an interceptor for such wastes must be installed.[10-15-97]

B. Installation of such interceptors shall comply with Chapter 7 of the Uniform Plumbing Code as administered by the Construction Industries Division. Interceptors shall be installed in locations that meet the minimum setback and clearance requirements of Table 303.1.[10-15-97]

408. INSPECTION AND TESTING

A. Inspection

1. The person doing the work authorized by the permit shall notify the Department, orally or in writing, when the said work is ready to be inspected. Such notification shall be given not less than forty-eight (48) hours before the work is to be inspected [10-15-97].

1977 SEP -8 11 5:01

2. System components shall be properly identified as to manufacturer and shall meet all specifications specified in this Subpart. Septic tanks, holding tanks (vaults) or other primary treatment systems shall have the rated capacity, the registration number and the year of manufacture permanently marked on the unit. [10-15-97]

B. Testing

1. The Department may require septic tanks or other primary components to be filled with water to flow line prior to inspection by the Department. If required by the Department, all seams or joints shall be left exposed (except the bottom) and the tank shall remain watertight for a period not less than twenty-four hours. [10-15-97]

2. The Department may require a flow test be performed through the system to the point of effluent disposal. All lines and components shall be watertight. Capacities, required air space, and fittings shall meet the requirements of this Subpart. [10-15-97]

409. AEROBIC TREATMENT SYSTEMS

Alternative on-site liquid waste systems employing aerobic treatment may be substituted for conventional septic tanks provided the permit applicant demonstrates that the proposed system will meet the requirements of Section 306, whether its aeration system is operating or not. [10-15-97]

10. ABANDONED SEWERS AND ON-SITE LIQUID WASTE SYSTEMS

1. Every abandoned building sewer, or part thereof, shall be plugged or capped utilizing a cap or plug prescribed by the Uniform Plumbing Code within five (5) feet of the property line. [10-15-97]

2. Every cesspool, holding tank, septic tank, seepage pit or other liquid waste treatment unit which has been abandoned or has otherwise been discontinued from further use or to which no waste or building sewer from a plumbing fixture is connected, shall have the liquid waste pumped therefrom and properly disposed. The empty liquid waste treatment unit shall be completely filled with earth, sand, gravel, concrete, or other approved material. [10-15-97]

3. The top cover or arch over the cesspool, holding tank, septic tank, seepage pit or other liquid waste treatment unit shall be removed before filling and the filling shall not extend above the top of the vertical portions of the sidewalls or above the level of any outlet pipe until inspection or authorization by the Department. After such inspection or authorization, the cesspool, holding tank, septic tank, seepage pit or other liquid waste treatment unit shall be filled to the level of the top of the ground. [10-15-97]

4. Where disposal facilities are abandoned consequent to connecting any premises with a public sewer, the permittee making the connection shall

fill all abandoned facilities as required by the Department within 30 day-
from the time of connection.[10-15-97]

411. - 499. RESERVED

500.

SUBPART V: MISCELLANEOUS

501. CONSTRUCTION. This Part shall be liberally construed to carry out its purpose. [10-15-97]

502. TEMPORARY PROVISIONS. All registration certificates, permits, orders, rulings, and variances issued pursuant to the regulations in effect at the time such registration certificates, permits orders, rulings, or variances were issued shall remain in full force and effect until repealed, replaced, superseded, or amended pursuant to this Part. [10-15-97]

503. SEVERABILITY. If any provision or application of this Part is held invalid, the reminder, or its application to other situations or persons, shall not be affected. [10-15-97]

504. REFERENCES IN OTHER REGULATIONS. Any reference to the Liquid Waste Disposal Regulations in any other rule shall be construed as a reference to this Part. [10-15-97]

505. SAVINGS CLAUSE. Repeal or supersession of prior versions of the Liquid Waste Disposal Regulations shall not affect any administrative or judicial action for the enforcement thereof. [10-15-97]

506. COLLATERAL REQUIREMENTS. Compliance with this Part does not relieve any person from the responsibility of meeting more stringent city or county regulations or ordinances or other requirements of state or federal laws governing the treatment or disposal of liquid waste. [10-15-97]

507. LIMITATION OF DEFENSE. The existence of a valid permit for installation or modification of an on-site liquid waste system shall not constitute a defense to a violation of any section of this Part except the requirement for obtaining a permit (Section 201). [10-15-97]

508. - 599. RESERVED

**INTERNATIONAL ASSOCIATION OF PLUMBING
AND MECHANICAL OFFICIALS**

MATERIAL AND PROPERTY STANDARD

FOR

PREFABRICATED SEPTIC TANKS

IAPMO PS 1-93

1. PURPOSE

- 1.1** The purpose of this Standard is to establish an acceptable quality standard for prefabricated septic tanks of steel, concrete, fiberglass reinforced plastic or polyethylene intended for domestic sewage disposal systems. It shall serve as a guide for producers, distributors, architects, engineers, contractors, installers, inspectors and users, and to promote a better understanding regarding materials, manufacture, and installation. The provisions of this Standard are not intended to prevent the use of any alternate material or method of construction, provided any such alternate meets the intent of this Standard.

2. SCOPE

- 2.1** Septic tank design shall be such as to produce a clarified effluent consistent with accepted practice and shall provide adequate space for sludge and scum accumulations.

3. REFERENCED STANDARDS

- 3.1** All standards referenced herein shall be the current edition of that standard as published in Table 14-1 of the Uniform Plumbing Code. Copy of the current Table 14-1 can be obtained from IAPMO.

4. BASIC REQUIREMENTS

- 4.1** Drawings stamped by a registered Professional Engineer (PE) shall be provided for all tanks submitted for listing. Drawings shall be complete and shall show all dimensions, capacities, reinforcing, structural calculations and other such pertinent data as may be required.
- 4.1.1** Septic tanks shall be constructed of solid durable materials, which are not subject to excessive corrosion and degradation in the presence of domestic sewage and shall

be watertight. Materials which corrode or degrade in the presence of domestic sewage shall be protected from corrosion and degradation in accordance with the requirements of this standard.

- 4.2** Septic tanks shall have a minimum of two (2) compartments. The inlet compartment of any septic tank shall be not less than two-thirds ($2/3$) of the total capacity of the tank nor less than five hundred (500) gallons (1892 liters) liquid capacity, and shall be at least three (3) feet (0.9 m) in width and five (5) feet (1.5 m) in length. Liquid depth shall be not less than two (2) feet (0.6 m) and six (6) inches (15.2 mm) nor more than six (6) feet (1.8 mm). The secondary compartment of any septic tank shall have a minimum capacity of two hundred-fifty (250) gallons (946 liters) and a maximum capacity of one-third ($1/3$) of the total capacity of such tank. In septic tanks having over fifteen hundred (1500) gallons (5677 liters) capacity, the secondary compartment may not be less than five (5) feet (1.5 m) in length.
- 4.3** Access to each septic tank shall be provided by at least two (2) manholes twenty (20) inches (0.5 m) in minimum dimension. One access manhole shall be located over the inlet and one access manhole shall be located over the outlet. Whenever a first compartment exceeds twelve (12) feet (304.8 mm) in length, an additional manhole shall be provided over the inlet side of the baffle wall fitting.
- 4.4** The inlet and outlet pipe or baffle shall extend four (4) inches (101.6 mm) above and at least twelve (12) inches (304.8 mm) below the water surface. The invert of the inlet pipe shall be at a level not less than two (2) inches (50.8 mm) above the invert of the outlet pipe.
- 4.4.1** The inlet and outlet pipe openings shall be not less in size than the connecting sewer pipe. The vertical leg of a round inlet and outlet fittings shall not be less in size than the connecting sewer pipe nor less than four (4) inches (101.6 mm). A baffle type fitting shall have the equivalent cross-sectional area of the connecting sewer pipe and not less than a four (4) inch (101.6 mm) horizontal dimension when measured at the inlet and outlet pipe inverts.
- 4.5** Inlet and outlet fittings or baffles, and compartment partitions, shall have a free vent area equal to the required cross-sectional area of the house sewer to provide free ventilation above the water surface from the disposal field or seepage pit through the septic tank, house sewer and vent stack to the outside air.
- 4.5.1** Adequate partitions or baffles of sound durable material shall be constructed between compartments and shall extend at least four (4) inches (101.6 mm) above the liquid level. Flow from inlet to outlet compartment shall be through a tee, ninety (90°) degree elbow or similar fitting (equivalent in size to the tank inlet but not less than four (4) inches (101.6 mm) in diameter), inverted and extending down into the inlet compartment so that the entry to the fitting is midway in the liquid depth of the tank. Wood baffles are prohibited.
- 4.5.2** Septic tanks shall have an air space equal to not less than ten (10) percent of the

liquid volume and total depth shall not be less than nine (9) inches (229 mm) greater than the liquid depth. The cover of the septic tank shall be at least two (2) inches (50.8 mm) above the back vent openings.

4.6 Walls shall be designed for an inside hydrostatic water pressure to the level of the outlet and for an outside earth pressure equivalent to that exerted by a fluid weighing thirty (30) pounds per cubic foot (480.6 kg/m³), in accordance with accepted engineering practice.

4.6.1 Internal baffles and fittings shall be designed to withstand the hydraulic and earth loads occurring when any compartment is empty of fluid and the remaining compartments are flooded.

4.7 Septic tanks and covers shall be designed for an earth load of not less than five hundred (500) pounds per square foot (23.94 KPa) when the maximum coverage does not exceed three (3) feet (0.9 m). Each tank and cover shall be structurally designed to withstand all anticipated earth or other loads and to be installed level and on a solid bed. Wood covers are prohibited.

4.7.1 Each such access opening shall have a leak-resistant closure (i.e., lid) that cannot slide, rotate or flip, exposing the opening when properly installed and which does not require the use of mechanical fasteners.

NOTE: The intention is that a child-resistant lid be provided. Mechanical fasteners are recommended to augment the safety of and ensure positive closure of the lid.

4.7.2 Manufacturers shall supply with each tank either suitable manhole extensions or recommendations regarding suitable extensions.

4.8 Gaskets, when required, shall be of resilient material, resistant to attack by acids or alkalies that may be present in soils or sewage. Manufacturers shall specify the appropriate ASTM standards for the gasket material.

4.9 Tanks consisting of two or more sections shall have joints designed such that uniform pressure is exerted on joint sealants or gaskets along their entire length and shall provide a continuous watertight seal. The joint material shall be supplied by the manufacturer and shall be applied at the time of installation, unless otherwise approved by the Administrative Authority. Any tank with a horizontal joint below the liquid level shall be permanently bonded in accordance with accepted engineering practices by the manufacturer.

5. MATERIALS

5.1 **Concrete**

5.1.1 Concrete shall have a minimum compressive strength of thirty-five hundred (3500)

pounds per square inch (24132 KPa). Concrete shall have a maximum water/cementing materials ratio of 6 gal.(22.7 liter)/sack of cement. Concrete shall be made with Type II or V, low/alkali portland cement conforming to ASTM C 150, Specification for Portland Cement, and shall also include sulfate expansion option as specified in Table 4 of ASTM C 150 for Type II or V. Concrete shall contain 4% - 7% entrained air utilizing admixtures conforming to ASTM C 260, Specification for Air Entraining Admixtures for Concrete. Concrete aggregates shall conform to ASTM C 33, Specification for Concrete Aggregates. Ready mix concrete, if used, shall conform to ASTM C 94, Specification for Ready Mix Concrete. Fly ash and raw or calcined natural pozzolan, if used as a mineral admixture in portland cement concrete, shall conform to ASTM C 618, Specification for Fly Ash and Raw or Calcined Natural Pozzolan for use as a mineral Admixture in Portland Cement Concrete.

5.1.2 Walls shall have a thickness of at least three (3) inches (76.2 mm), except where engineering analysis and production methods can justify a lesser thickness.

5.1.3 The minimum area of steel reinforcement (in both directions) of the structural elements shall be in accordance with ACI 318-89. Specifications for steel reinforcements and placement location shall also comply with ACI 318-89. Tanks shall be of sufficient strength to resist stresses caused during handling and installation without structural cracking.

5.1.4 If repairs are necessary they shall be carried out in accordance with the appropriate provision of ASTM Standards (refer to Section 5.1.1 and 5.1.3).

5.2 Steel Septic Tanks

5.2.1 The minimum wall thickness of any steel septic tank shall be No. 12 U. S. Gauge (.109 inch) (2.8 mm) and each such tank shall be protected from corrosion, both externally and internally, by an approved waterproof bituminous compound complying with ASTM D 41, Asphalt Primer Used in Damproofing and Waterproofing and ASTM D 449, Type A, Asphalt Used in Damproofing and Waterproofing or ASTM D 2823, Type I for Asphalt Roof Coatings and shall be applied per the manufacturer's recommendation.

5.2.2 Steel plate and sheet used in the fabrication of steel tanks shall be of good welding quality and shall comply with the following ASTM Standards or recognized equivalents:

- (a) A 283 Specification for Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes, and Bars
- (b) A 569 Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip, Commercial Quality
- (c) A 635 Specification for Steel, Sheet and Strip, Heavy Thickness Coils, Carbon, Hot Rolled

Baffles shall be made from steel having either a minimum thickness of 0.165 inch (4.2 mm) or a minimum thickness equal to the shell thickness, whichever is greater.

5.3 Glass-Fiber-Reinforced Polyester

5.3.1 Terminology - Unless otherwise indicated, the plastics terminology used in this Standard is in accordance with the definitions given in ASTM D 883, Definitions of Terms Relating to Plastics.

5.3.2 Materials - The tank, cover, baffles, flanges, etc., shall be made from polyester resins with glass-fiber reinforcement.

5.3.3 Resin - The resin shall be a chemical-resistant grade of polyester resin and shall be evaluated as a laminate by test (see Appendix A for a recommended test), or known from previous service to be acceptable for the environment. The same resin shall be used throughout the laminate. Other plastic resins proven to be as satisfactory for the intended end use will be acceptable. A typical isophthalic polyester which will meet these requirements is described in Appendix B.

5.3.4 Reinforcing Material - The reinforcing material shall be of a suitable commercial grade of glass fiber (E glass) treated with coupling agent, approved by the glass fiber manufacturer, that will provide a compatible bond between the resin and the glass. Glass-fiber surfacing materials, if used, shall be of a chemical-resistant glass (C glass) bonded with a suitable binder.

5.3.5 Fillers and Pigments - The resins used shall not contain fillers except as required for viscosity control. Up to two (2) percent by weight of the total resin content of thixotropic agent that will not interfere with visual inspection may be added to the resin for viscosity control. Resins may contain pigments and dyes by agreement between fabricator and purchaser, recognizing that such additions may interfere with visual inspection of laminate quality.

5.3.6 Laminate (See Figure 1)

The laminate shall consist of the following:

- (1) Primary chemical-resistant surface.
- (2) Internal anti-wicking barrier.
- (3) Additional structural reinforcing section if required to meet the properties shown in Table 1.
- (4) External anti-wicking barrier.
- (5) Exterior Surface.

NOTE: The compositions specified in 4.1 (1), (2), (4), and (5) are intended to achieve optimum chemical resistance.

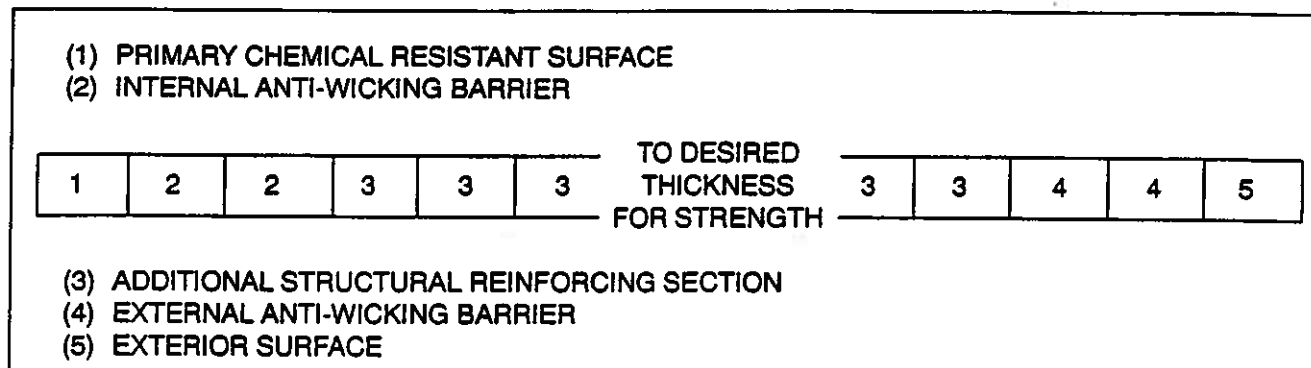


Figure 1

- 5.3.7 Primary Chemical Resistant Surface** - This surface shall be between 0.005 and 0.0012 inch (0.1 and 0.3 mm) thick. It shall be a reinforced resin rich surface.¹ It shall be free from cracks and crazing and shall have a smooth finish without bubbles or blisters. Some waviness is permissible. It shall be made in such a manner that air has not been allowed to inhibit the cure of the surface exposed to the environment.
- 5.3.8 Internal Anti-Wicking Barrier** - Not less than 0.100 inch (2.5 mm) of chemical-resistant laminate next to the inner surface shall be reinforced with not less than 20 percent nor more than 30 percent by weight of mat or chopped strand.
- 5.3.9 Additional Structural Reinforcing Section** - This layer or body of the laminate shall be of chemically resistant construction suitable for the intended use and providing the additional strength necessary to meet the tensile and flexural requirements. Where separate layers such as mat, cloth or woven roving are used, all layers shall be lapped at least one (1) inch (25 mm). Laps shall be staggered when woven roving or cloth is used; layers of chopped strand glass shall be placed as alternate layers.
- 5.3.10 External Anti-Wicking Barrier** - Same as 5.3.8.
- 5.3.11 Exterior Surface** - This surface shall consist of a chopped strand glass over which shall be applied a resin-rich coating as described in paragraph 5.3.7.
- 5.3.12 Cut Edges** - All cut edges shall be coated with resin so that no glass fibers are exposed and all voids are filled. Structural elements having edges exposed to the chemical environment shall be made with chopped strand glass reinforcement only.
- 5.3.13 Wall Thickness** - The minimum wall thickness shall be as recommended by the manufacturer but in no case shall it be less than 3/16 inch (4.8 mm) regardless of operating conditions.
- 5.3.14 Mechanical Properties** - In order to establish proper wall thickness and other design characteristics, the minimum physical properties for any laminate shall be as shown in Table 1 and paragraph 5.3.15.

Table 1
Requirements for Properties of
Newly Fabricated Reinforced Polyester Laminates

PROPERTY AT 73.4°F (23°C)	Thickness (in.) (mm)			3/8 and Up (9.5)	Test Method
	3/16(4.8)	1/4(6.4)	5/16(7.9)		
Ultimate tensile strength, min.	psi(MPa) 9,000(62)	psi(MPa) 12,000(83)	psi(MPa) 13,500(93)	psi(MPa) 15,000(103)	Par. 5.3.21.2
Flexural Strength, min.	16,000(110)	19,000(131)	20,000(137)	22,000(152)	Par. 5.3.21.3
Flexural modulus of elasticity (tangent) min.	700,000 (4823)	800,000 (5512)	900,000 (6201)	1,000,000 (6895)	Par. 5.3.21.4

5.3.15 Surface Hardness - The laminate shall have a Barcol Hardness of at least the manufacturer's minimum specified hardness for the cured resins when tested in accordance with ASTM D 2583. This requirement applies to both interior and exterior surfaces.

5.3.16 Appearance - The finished laminate shall be free from visual defects such as foreign inclusions, dry spots, air bubbles, pinholes, pimples and delamination. Both surfaces shall be free from cracks and crazing and have a smooth finish and an average of not more than 2 pits per square foot, (21 pits/m²) providing the pits are less than 1/8 inch (3.2 mm) diameter and not more than 1/32 inch (0.8 mm) deep and are covered with sufficient resin to avoid exposure of inner surface fabric. Some waviness is permissible provided the surface is smooth and free from pits. Unless otherwise specified, ASTM D 2563 visual acceptance level 3 shall be the minimum standard for acceptance.

5.3.17 Shell Joints - Tanks manufactured in sections may be joined by use of flanges, bell and spigots and butt joints, however, any tank with a horizontal joint below the liquid level shall be permanently bonded in accordance with accepted engineering practices by the manufacturer. All joints shall meet the corrosion resistance requirements for the intended end use. Overlaid joints shall be as specified in Table 2.

5.3.18 Flange, bell and spigot joints above the liquid level shall be designed and bonded in accordance with accepted engineering practices.

5.3.19 Butt joints shall consist of glass fiber reinforced resin at least the thickness of the heaviest section being joined. The reinforcement shall be applied both inside and out.

5.3.20 Testing and Test Methods

5.3.20.1 Specimens - Tests shall be made on specimens cut from waste areas when possible; otherwise, the specimens shall be cut from flat laminates prepared in the

same construction and by the same techniques as the process equipment. In all cases, the average value of the indicated number of specimens shall be used to determine conformance with the detailed requirements.

Table 2
Minimum Total Widths of Overlays for
Reinforced-Polyester Tank Shell Joints

Tank Wall Thickness-- in. (mm)	3/16 (4.8)	1/4 (6.4)	5/16 (7.9)	3/8 (9.5)	7/16 (11.1)	1/2 (12.7)	9/16 (14.3)	5/8 (15.9)	11/16 (17.5)	3/4 (19.1)
Min. outside overlay width, in. (mm)	4 (100)	4 (100)	5 (125)	6 (150)	7 (175)	8 (200)	9 (225)	10 (250)	11 (275)	12 (300)
Min. inside overlay width, in. (mm)	4 (100)	4 (100)	5 (125)	5 (125)	6 (150)	6 (150)	6 (150)	6 (150)	6 (150)	6 (150)

5.3.20.2 Conditioning - The test specimens shall be conditioned in accordance with Procedure A of ASTM Designation D 618, Standard Methods of Conditioning Plastics and Electrical Insulating Materials for Testing.

5.3.21 Tests

5.3.21.1 Glass Content - The glass content shall be no less than 30% as determined in accordance with ASTM Designation D 2584, Tentative Method of Test for Ignition Loss of Cured Reinforced Resins, except that the specimens tested shall be approximately one (1) square inch (645.2 mm²) in area and low temperature pre-ignition prior to placement in muffle furnace is recommended. The average for five specimens shall be considered to be the glass content.

5.3.21.2 Tensile Strength - Tensile strength shall be determined in accordance with ASTM Designation D 638, Test for Tensile Properties of Plastics (Tentative) except that the specimens shall be the actual thickness of the fabricated article and the width of the reduced section shall be one inch.

Other dimensions of specimens shall be as designated by the ASTM standard for Type 1 specimens for materials over 1/2 inch to inch (12.7 mm to 25.4 mm) inclusive. Specimens shall not be machined on the surface. Tensile strength shall be the average of five specimens tested at 0.20 - 0.25 in./min. (5.1 - 6.4 mm/min.) speed.

5.3.21.3 Flexural Strength - Flexural strength shall be determined in accordance with Procedure A and Table 1 of ASTM Designation D 790, Standard Method of Test for Flexural Properties of Plastics, except that the specimens shall be the actual thickness of the fabricated article and the width shall be one inch (25.4 mm). Other dimensions of specimens shall be as designated by the ASTM standard. Specimens shall not be machined on the surface. Test shall be made with the inner side in compression using five specimens.

5.3.21.4 Flexural Modulus - The tangent modulus of elasticity in flexure shall be determined by ASTM Method D 790.

5.3.21.5 Hardness - The Barcol Impressor (Model GYZJ 934-1) shall be used for determining hardness. Calibration of the Barcol instrument shall be verified by comparing with a blank specimen having a known reading of 85-87. Ten (10) readings on the clean resin-rich surface shall be made. After eliminating the two high and two low readings, the average of the remainder shall be the reported hardness reading.

5.4 Polyethylene

5.4.1 The polyethylene used shall be Type II or III and Category 3 per ASTM Standard D 1248, Specification for Polyethylene Plastics Molding and Extrusion Materials, Class B (requiring an ultraviolet stabilizer) or Class C (requiring a minimum of 1% carbon black); and shall have a stress crack resistance of at least 150 hours when measured in accordance with ASTM Standard D 1693, Test Method for Environmental Stress-Cracking of Ethylene Plastics; and ASTM D 638, Test Method for Tensile Properties of Plastics with a value of equal to or greater than twenty-four hundred (2400) psi (16548 KPa); ASTM D 790, Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials with a flexural modulus of elasticity equal to or greater than eighty five thousand (85,000) psi (586075 KPa).

5.4.2 The thickness of the side walls, top, bottom, and covers shall be at least 1/4" (6.4 mm). The thickness of the inlet and outlet ends shall be at least 1/4" (6.4 mm), and the thickness of internal walls and partitions shall be at least 3/16" (4.8 mm).

5.5 Alternate Materials

Septic tanks constructed of alternate materials may be approved by the Administrative Authority when complying with approved applicable standards. Wooden septic tanks are prohibited.

6. CHECKING AND TESTING

6.1 Independent laboratory tests and engineering calculations certifying the tank capacity and structural stability shall be provided.

6.2 Water Testing - A sampling from each manufacturer's production run shall be water tested. One sample shall be tested for each size tank manufactured. Sample tanks shall be assembled per manufacturer's instructions, set level, and water raised to the flow-line of the outlet fitting.

Tanks shall show no leakage from section seams, pinholes, or other imperfections. Any leakage is cause for rejection. When leakage occurs additional water testing shall be made from new samples after correcting measures in production or installation have been completed. Test reports shall show total number of tanks

tested, number passing, number failing, location and cause of leakage. When leakage occurs corrective measures taken shall be reported.

7. MARKING

- 7.1** Each tank shall be clearly and permanently marked with the manufacturer's name and/or registered trademark, the month and year of manufacture, the maximum recommended depth of earth cover in feet and the nominal working volume. Permanent markings shall be adequately protected from corrosion so as to remain permanent and readable over the life of the tank.
- 7.2** Each tank shall be accompanied by adequate, clear instructions for installation. Cautions regarding the installation of cribbing or sleeves around the manhole shall also be included.

APPENDIX A

- A1 Chemical Resistance.** ASTM Designation C 581, Tentative Method of Test for Chemical Resistance of Thermosetting Resins Used in Glass Fiber Reinforced Structures* is recommended for the evaluation of the chemical resistance of materials to be used in reinforced-polyester chemical-resistant process equipment. The reinforcing materials prescribed in the test laminate are only for the purpose of establishing a uniform basis for comparison. They may not necessarily represent the preferred materials for the particular environment. This procedure may be adapted to test or evaluate components, composition or fabrication variations and production samples. For information on the basis for selection of the standard test laminate, see Appendix of ASTM C581.
- A1.1** The 10 Mil surfacing mat referred to in paragraph 5.1.2.1 of ASTM C 581 shall be made of chemical resistant glass (Type C or equal).
- A1.2** The standard test laminate shall be cured at room temperature for 16 hours. Further cure shall be given at room or higher temperature, if necessary, to produce a Barcol Hardness in accordance with paragraph 4.2.7.2.
- A2 Temperature** - Tests may be conducted at any or all of the following temperatures: 23°C, 50°C, 70°C, 100°C ($\pm 2^\circ\text{C}$); reflux temperature; required service temperature.
- A3 Reagents** - The following reagents are suggested for use in obtaining general comparative chemical resistance data. The test solutions shall not be agitated; i.e., the exposures shall be under static conditions.
1. 15% Hydrochloric Acid
 2. 25% Acetic Acid
 3. 5% Sodium Hydroxide
 4. 10% Sodium Carbonate
 5. Saturated Sodium Chloride
 6. 5-1/4% Sodium Hypochloride**
 7. Distilled Water**
- A4 Time** - The properties specified in A5 shall be determined for specimens immersed in the test solutions for 30 days, 90 days, 180 days and one year, for one set of control specimens immediately following the curing period, and for another set after aging in air at the test temperature for the total test period.
- A5 Properties** - Thickness, Barcol Hardness, flexural strength and modulus, and appearance, shall be determined at each time interval. Appearance observations shall include any surface changes, color changes, obvious softening or hardening, crazing, delamination, exposure of fibers, or other effects indicative of complete degradation or potential failure. Calculation of percentage change in a property shall be based upon the property value obtained immediately following the curing period, i.e., unexposed laminate.
- A6 Report** - Data shall be reported in tabular form for all parameters tested. The composition, including resin, accelerators, catalysts and reinforcements, and the fabricating and curing conditions of the laminate tested, shall be adequately described.

APPENDIX B

An example of a polyester resin meeting the requirements is an isophthalic acid based chemically resistant type having an alkyd cooked using propylene glycol and an approximately 1/1 molar ratio of isophthalic acid and maleic anhydride or fumaric acid.

The alkyd shall have a minimum molecular weight of 250, an acid number of less than 20 and a hydrosyl number of less than 45. The alkyd shall be combined with styrene monomer in proportions requisite to give the necessary working viscosity.

The resin may also contain thixotropic additives as defined in 5.3.1 and promoters for room temperature cures. Resin used for final surface coats on laminate surfaces exposed to air during cure may contain paraffin wax to prevent air inhibition.

Ratified by Membership: 1958

Revised: 1966, 1974, 1982, 1983, 1987, 1993

¹ This resin-rich surface layer will usually contain less than 20 percent of reinforcing material. A specific limit is not included because of the impracticability of determining this value in the finished product.

* This method is based on a test procedure developed by the Reinforced-Plastic-Corrosion-Resistant Structures Subcommittee of the Society of the Plastic Industry, Inc.

** Replaced every 48 hours with fresh material.