RESOLUTION 2011- 20

A RESOLUTION ADOPTING THE LEAVENWORTH COUNTY SANITARY CODE

WHEREAS, K.S.A. 19-3704 authorizes the Board of County Commissioners of Leavenworth County, Kansas, herein after called the BOARD, to adopt a Sanitary Code:

WHEREAS, the Board believes the public safety, health and welfare will be served by the adoption of a revised Sanitary Code;

WHEREAS, the Director of the Bureau of Water at the Kansas Department of Health & Environment has reviewed and approved the proposed sanitary code;

WHEREAS, Copies of the Leavenworth County Sanitary Code, dated May 26, 2011 are available for public inspection at the Leavenworth County Clerk's office, 300 Walnut, Leavenworth, Kansas;

WHEREAS, The adopted September, 1999, January, 1995 Leavenworth County, Kansas Sanitary Code shall be rescinded;

WHEREAS, This resolution shall take effect and be in force from and after the publication once in the official county newspaper.

Adopted this 26th day of May, 2011
Board of County Commissioners
Leavenworth County, Kansas

Clyde D. Graeber, Chairman

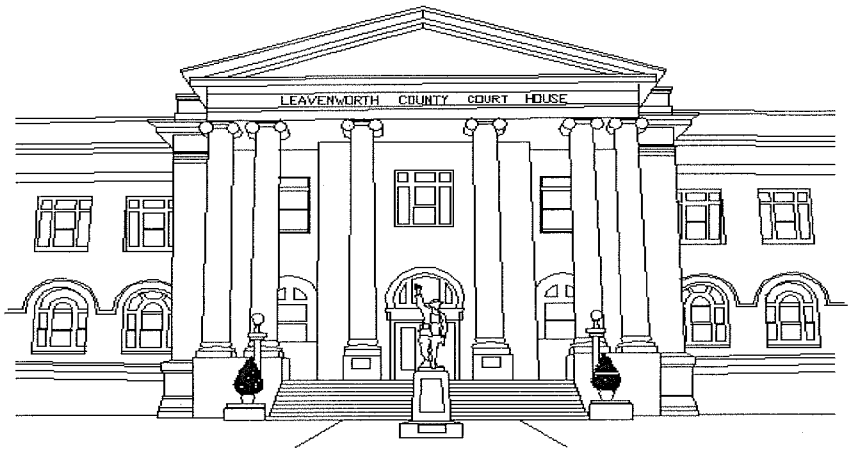
ABSENT
John E. Flower, Member

Robert W. Holland, Member

ATTEST:

Janet Klasinski, County Clerk

Leavenworth County Sanitary Code



LEAVENWORTH COUNTY PLANNING DEPARTMENT
COURTHOUSE, 300 WALNUT, SUITE 030
LEAVENWORTH, KANSAS 66048
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LEAVENWORTH COUNTY SANITARY CODE

CHAPTER 1

POLICY, ADMINISTRATION AND ENFORCEMENT

ARTICLE 1: GENERAL PROVISIONS

SECTION I. Title

This code shall be known and referred to as the Leavenworth County Sanitary Code.

SECTION II. Legal Authority

This Code is adopted under the authority granted to the Board of County Commissioners by K.S.A. 19-3701 et. seq. as amended.

SECTION III. Findings and Declaration of Policy

A fundamental duty of every government is the protection of the health and safety of its citizens and to thereby promote the public welfare. Consequently, the Board of County Commissioners hereby finds, determines, and declares that it is necessary to adopt a uniform system of rules, regulations, and standards to eliminate and prevent environmental conditions that are or may be hazardous to the public health, safety, and welfare and to thereby promote the safe, economical, and orderly development and conservation of the land and resources of the County.

SECTION IV. Purpose

The purpose of this Code is:

A. To promote the public health, safety, comfort, and well being of the public; and

B. To prescribe the procedures to be followed in administering this Code; and

C. To prescribe rules, regulations, standards, and enforcement procedures to minimize, control, or eliminate potential or actual sources or causes of disease, infection, contamination, or pollution, whether in food, solid waste, sewage, air, water, or other media; and

D. To protect the integrity of water, air, soil, and natural resources, including aquatic biota, flora, fauna, and wildlife through the prevention of pollution and degradation of the environment by regulation of activities, which may affect environmental conditions.

SECTION V. Jurisdiction and Application

This Code and all authorized rules, regulations, restrictions, and requirements shall apply from and after the effective date of adoption to and throughout the unincorporated area of Leavenworth County, Kansas, and to all persons, property, establishments, and business activities located or conducted, regardless of ownership and acreage, within Leavenworth County, Kansas and outside the

municipal boundaries of any city. All onsite wastewater systems shall be designed, constructed and operated in accordance with standards set forth in KDHE Bulletin 4-2 "Minimum Standards for Design and Construction of Onsite Wastewater Systems" published March, 1997, as amended, by KDHE and Kansas State University Agricultural Experiment Station and Cooperative Extension Service, KDHE Bulletin 4-2 is hereby adopted by reference and is included herein as an Appendix to this Code." In the case of any conflict of requirements between the Leavenworth County Sanitary Code and KDHE Bulletin 4-2, the more restrictive of these requirements shall apply.

SECTION VI. Applicability within City Boundaries

This Code and any or all of the authorized rules, regulations, restrictions and requirements shall apply within and throughout any city in Leavenworth County, Kansas and to all persons, property, establishments and business activities located or conducted within the municipal boundaries of any city from and after the effective date of adoption of this Code, by appropriate ordinance, by the governing body of the City.

SECTION VII. Public Health Jurisdiction and Application

This Code and any or all rules, regulations, restrictions, and requirements shall apply to and throughout all areas of Leavenworth County, Kansas, including those areas located within the municipal boundaries of any city, whenever authorized or required under application of the Laws of the State of Kansas or of the United States, whether by statute, contract, rule, regulation, or pursuant to the jurisdiction of the Leavenworth County Board of Health.

SECTION VIII. Severability

If any clause, sentence, paragraph, section, or subsection of this Code shall be adjudged invalid for any reason whatsoever, such judgment shall not affect, repeal, or invalidate the remainder thereof, but shall be confined to the clause, sentence, paragraph, section, or subsection thereof found to be invalid.

SECTION IX. Disclaimer of Liability

This Code shall not be construed or interpreted as imposing upon the County, or any city which adopts this Code, or its officials or employees: (1) any liability or responsibility for damages to any property; or (2) any warranty that any installation, system, or portion thereof that is constructed or repaired under permits or inspections required by this Code will function properly. In addition, any employee charged with the enforcement of this Code, who acts in good faith and without malice in the discharge of his or her duties, shall not thereby be personally liable and is hereby relieved from personal liability for damage which may occur to any person or property as a result of the discharge of his or her duties.

SECTION X. Amendments and Additions

This Code may be supplemented or its provisions may be amended by resolution adopted by the Board of County Commissioners, after notice and hearing, as

required by law, and any such amendments or additions shall be incorporated within and codified as a part of this Code. Any changes, modifications, or additional provisions adopted and imposed by State or Federal law, rule or regulation are applicable to and administered through the jurisdiction of Leavenworth County, Kansas shall be incorporated within and made a part of this Code, with or without notice and hearing, as authorized or required by State or Federal law.

SECTION XI. Repeal and Supersede Effect

This Code shall supersede any and all previously adopted resolutions or regulations, which are, in whole or in part, in conflict with any provision of this Code, where applicable, and any rule, regulation or resolution which is or was in effect upon the effective date of this Code shall be repealed to the extent necessary to give this Code full force and effect, and in the case of any conflict of provisions, whether real or apparent, then the provisions of this Code shall govern wherever applicable.

SECTION XII. Effective Date

This Code shall become effective from and after the date of adoption by the Board of County Commissioners, or other appropriate jurisdiction, and publication of notice as required by law.

ARTICLE 2: ADMINISTRATION

SECTION I. Administering Authority

Unless otherwise specifically designated within a separate and particular Chapter or Article of this Code, the Director of the Planning and Zoning Department, and/or his designee, shall have the primary authority and responsibility for the administration of this Code.

Under the authority of any particular Chapter or Article of this Code, the Director of the Planning and Zoning Department may implement such administrative procedures, consistent with this Code, as he deems necessary for the effective administration of any regulations or which may be required or imposed under application of the laws of the State of Kansas or the United States.

The Board of County Commissioners, or appropriate authority of any city which adopts this Code, may designate code enforcement officers who shall be responsible for the enforcement of all provisions of this Code in coordination with the Director of the Planning and Zoning Department or his designees.

SECTION II. Administrative Actions and Decisions

It is the intent of this Code to establish regulations and standards for the protection of the public health and safety. To the extent possible, all administrative actions and decisions required or authorized for the administration of this Code shall be made solely in accordance with the standards enumerated in the Code. Whenever, in the course of administrative decision or taking action for which standards are not provided, then the decision or action shall be made according to the purpose and intent of this Code so that the result will best serve the public health and safety.

SECTION III. Interpretation of Terms or Words

All terms and words used in this Code shall be interpreted and given meaning according to their common understanding and to provide reasonable application of the purpose and intent of the Code. Whenever applied to this Code, the terms and phrases used shall be interpreted in the following manner:

A. Words appearing in the singular number shall include the plural, and those appearing in the plural shall include the singular.

B. Words used in the present tense shall include the past tense and future tense, and words used in the future tense shall include the present tense and past tense.

C. Words appearing in the masculine gender shall include the feminine and neutral genders.

D. The word "shall" is mandatory; the word "may" is permissive.

E. The phrase "this Code" shall refer to the Code and all authorized rules, regulations, restrictions, and requirements, and the phrase" the regulations" shall include rules, regulations, restrictions, and requirements authorized by the Code.

SECTION IV. Definitions

The following words, terms, and phrases appear in more than one Section of this Code and, thus, have general application and usage. Words, terms, and phrases appropriate or applicable to specific Sections within this Code are defined, where necessary, within those Sections. Unless the Code requires or specifies otherwise, the following words, terms, or phrases, as used in this Code, shall be given the meaning defined in this Section.

A. Access: Entry into or upon any real estate, structure, or vehicle including any part thereof.

B. Administering Agency: The agency or official designated in any of the Sections contained in this Code to administer the provisions of that Section or any Section therein.

C. Administrative Rules: Any regulation adopted by an administering agency, which the agency determines to be necessary and appropriate to enable it to fulfill its duties and responsibilities under this Code.

D. Agricultural Purpose: A land use related to the production of livestock or crops, including growing crops or pasture and functions immediately and necessarily related thereto, and the feeding of livestock by the resident on the land, but does not include any structure used as a dwelling or the sewage disposal system servicing such dwelling.

E. Applicant: Any person who submits an application or requests permission to do some act regulated by this Code.

F. Application: The application forms provided by an administering agency, including the filing fee and any other supporting documents required by the agency.

G. Authorized Representative: A person who is designated by an administering agency to administer the provisions of this Code or any Section therein.

H. Board of Health: The Board of County Commissioners acting as the Board of Health.

I. Board of County Commissioners: The Board of County Commissioners of Leavenworth County, Kansas

J. Cesspool: Cesspool means a "drywell" that receives solely untreated sanitary waste, and which sometimes has an open bottom and/or perforated sides. Drywell means a well, other than an improved sinkhole or subsurface fluid distribution system, completed above the water table so that its bottom and sides are typically dry except when receiving fluids.

K. Class V Well: Those wells defined in the Federal Underground Infection Control (UIC) Program as Class V and regulated by the Kansas Department of Health and Environment under Article 46.

L. Domestic Sewage: Sewage which is normally characterized as and is similar to residential wastewater, not commercial or industrial activity, and which originates primarily from kitchen, bathroom and laundry sources, including waste from food preparation, dishwashing, garbage grinding, toilets, baths, showers and sinks of a residential dwelling.

M. Effluent: The liquid waste discharged from a sewage disposal/treatment system.

N. Establishment: Any structure or self-contained unit therein, including single and multiple family dwellings, commercial and industrial buildings, schools, churches, and public institutions.

O. Flood Plain: Land that may be submerged by floodwaters, but is not normally submerged.

P. Ground Water Table: The upper surface of ground water in the zone of saturation of a geologic formation.

Q. Health Officer: The legally appointed Health Officer of Leavenworth County, appointed in accordance with K.S.A. 65-201 or his duly authorized representative.

R. Industrial and Commercial Wastes: Any wastes produced as a byproduct of any industrial or commercial process or operation, other than domestic sewage.

S. Industrial and Commercial On-Site Wastewater System: Any onsite wastewater system designed to receive industrial or commercial process water or any Class V well used exclusively for domestic waste which has the capacity to serve twenty (20) or more persons.

T. KDHE: Means the Kansas Department of Health and Environment.

U. Law: Includes federal, state, and local statutes, ordinances, regulations and resolutions.

V. Minimum On-Site Wastewater Standards: Reference: Current edition Kansas Department of Health and Environment Minimum Standards for Design and construction of On-Site Waste Water Systems. Used for minimum guidelines for techniques and materials in on-site systems in the absence of requirements in the Leavenworth County Sanitary Code.

W. Minimum Sewerage System: For domestic sewerage from facilities other than domiciles, the minimum sewerage system shall consist of a 1200-gallon septic tank and 900 square feet of absorptive lateral.

X. Permit: Document or license provided by the Administering Agency on standard forms to perform tasks required by this code.

Y. Person: An individual, corporation, partnership, association, state, or political subdivision thereof, federal agency, state agency, municipality, commission, or interstate body or other legal entity.

Z. Point Source: Any discernable, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.

AA. Pollution: Any induced alteration of the physical, chemical, biological, and radiological integrity of water, air, soil (both surface and subsurface), or contamination of food or foodstuffs.

BB. Premises: Any lot or tract of land and all buildings, structures or facilities located thereon.

CC. Private Onsite Wastewater System: A sanitary sewage system which retains sewage generated by an individual establishment on the same premises as the establishment and the sewage is treated onsite by soil absorption, evaporation, transpiration, holding tanks, aeration or any combination of the above and which does not hold a Kansas Water Pollution Control Permit.

DD. Sanitary Privy: A facility with a water-tight receptacle made of concrete or other material acceptable to the code administrator designed to receive, store and provide for periodic removal of non-water carried waste from the human body. Material removed from the water-tight receptacle is transported and disposed at a publicly owned wastewater treatment facility or other means as approved by local authorities.

EE. Sanitary Sewage System: Any system of pipes, tanks, conduits, structures or other devices for the collection, transportation, storage, treatment and disposal of sewage.

FF. Schedule of Compliance: A schedule of remedial measures and times including an enforceable sequence of actions or operations leading to compliance with any regulation or limitation.

GG. Seepage Pit: A dry well that receives effluent from a treatment device. The dry well is completed above the water table so the bottom and sides are dry except when receiving fluids.

HH. Sewage: A combination of liquid wastes which may include chemical, house wastes, laundry wastes, human excreta, animal or vegetable matter in suspension or solution, and other solids in suspension or solution, which is discharged from a dwelling, building, or other establishment.

II. Sewer District: Any quasi-municipal corporation duly formed, authorized and empowered to plan, construct and operate a public sewer system.

JJ. Soil Absorption System: A system consisting of trenches (although beds and pits have been historically used as well), together with piping or gravel or other medium, or other devices installed in appropriate soils for the purpose of receiving waste flow from a septic tank or other treatment device and transmitting it into soil for final treatment and disposal.

KK. Subdivision: Any land, vacant or improved, which is divided or proposed to be divided into two (2) or more lots, parcels, sites, unit, plots or interests for the purpose of offer, sale, lease, or development, either on the installment plan or upon any and all other plans, terms and conditions, including re-subdivision. "Subdivision" includes the division or development of residential and nonresidential-zoned land, whether by deed, metes and bounds description, map, plat or other recorded instrument.

SECTION V. Technical and Scientific Terms

Unless otherwise defined, any technical or scientific term used within this Code or within any rule, regulation, restriction or requirement shall be given the meaning most commonly known and applied within the appropriate literature or manuals applicable for that science, industry or technological skill.

SECTION VI. Vested Interests

Nothing contained in this Code or any regulations shall be deemed or construed to grant any vested interest or protected right to any person beyond the express limited terms of any permit or ruling issued under this Code, and the Code and regulations are expressly declared to be subject to amendment, change, or modification.

SECTION VII. Compatibility with Other Laws

Nothing contained in this Code or any regulations shall be deemed to alter or modify the application of any other laws, codes or regulations which are or may be applicable to the property, use, business activity or other object or matter regulated under this Code, and any permit, approval or other condition given or acknowledged under this Code shall be limited in effect to the requirements of this Code and shall not, under any circumstances, relieve the holder from compliance with all other applicable laws, codes, regulations or requirements.

ARTICLE 3: PERMITS AND LICENSES

SECTION I. Permits and Licenses Required

No person shall conduct, carry-on or perform any business or activity identified in this Section without first having obtained a valid permit in conformance with the requirements of this Code.

A. Private Sewage Disposal System

Every person who installs, removes, alters, repairs or replaces or causes to be installed, removed, altered, repaired or replaced any private sewage disposal system or part thereof shall, prior to commencement of any work, apply for and obtain a permit to perform such work, and no private sewage disposal system shall be installed, removed, altered, repaired or replaced except pursuant to a permit issued under this Article.

B. Installer

Every person who conducts the activity of an installer as defined in Chapter II of this Code, shall apply for, obtain and maintain a valid operator's license to perform that activity.

C. Designer

Every person who conducts the activity of a Designer, as defined in Chapter II of this Code, shall apply for, obtain and maintain a valid license to perform that activity; provided, however, that any person licensed under this Code as an Installer shall be deemed a licensed designer for the design of those conventional and shallow-in-ground systems which are pumped or gravity-fed, as determined by the administering agency.

D. Sanitary Disposal Contractor

Every person who engages in or conducts the activity of a Sanitary Disposal Contractor, including homeowners, as defined in Chapter II of this Code, shall apply for, obtain and maintain a valid operator's license to perform that activity.

E. Industrial or Commercial On-Site Wastewater System Operation:

1. Every property owner or other responsible agent or person who has installed for use or who uses and operates an industrial or commercial on-site wastewater system shall, prior to its use, apply for and obtain a valid operations permit for the system. No industrial or commercial on-site wastewater system shall be installed, used, operated, altered, replaced or repaired except pursuant to a permit issued under this Section and pursuant to the requirements of Chapter II of this Code.

2. Any underground holding tank and Class V well shall comply with and satisfy all requirements and regulations now or hereafter adopted by the Kansas Department of Health and Environment.

3. Discharge of industrial or commercial waste to a soil absorption system is prohibited. Any such system in effect at the time of passage of this code shall cease and desist immediately.

SECTION II. Application Forms and Procedures

A. Content

An application for a permit or license shall be made on forms provided for that purpose. The application shall give a description of the character of the work proposed to be done, or activity to be engaged in, and, if appropriate, the locations, ownership, occupancy, and use of the premises in connection therewith. The administering agency may require plans, specifications or drawings and such other information as deemed necessary.

B. Filing

An application for any permit or license required under this Code shall be filed with the Planning and Zoning Department, or such other administering agency as the Director may designate or acknowledge.

C. Verification

An application for a permit must be signed by the person for whose benefit the permit is being requested or his or her authorized representative. The administering agency may require proof of such authorization

D. Compliance

The applicant shall be responsible for compliance with the permit requirements as further set out in this Code. Only a person who complies with the requirements of this Code shall be entitled to receive or retain a permit or license.

SECTION III. Permit Issuance; Investigations

If the administering agency determines that the application complies with the requirements of this Code, a permit shall be issued.In making its determination on whether to issue a permit the administering agency may perform an inspection to determine compliance with this Code.Within five (5) days, Saturdays, Sundays and holidays excepted, after receipt of an application for a permit, the administering agency shall begin such investigations and inspections as it shall deem necessary to determine whether the permit or license should be issued or denied, and shall issue or deny the permit of license within fourteen (14) days of receipt of the application. If the application is denied, the agency shall give the applicant written reason for denial.

It shall be the duty of the person performing the work authorized by a permit to notify the administering agency when work is ready for any required inspection. Such notification shall be given not less than one regular working day before the work is to be inspected.

SECTION IV. Permit Conditions

Every permit and license issued under this Code shall be subject to the terms and conditions specified in this Section.

A. Right of Access

Application for, and acceptance of, any permit issued under this Code shall grant to any inspector, code or law enforcement officer, and any representative of the administering agency the right to enter upon any property subject to the permit, at any reasonable time during standard business hours, with or without notice, for the purpose of inspection to determine and ensure qualifications for and compliance with the permit, and shall allow for reasonable access to the review of records, property or other materials necessary to perform the inspection.

B. Authorized Activity

Each permit or license issued under the authority of this Code shall be limited to and expressly provide for the type and manner of activity permitted for the holder and shall not be used nor applied for any other purpose, type or manner of activity. The permit or license issued shall specifically refer to the activity description contained within the permit or license application, and any change in the type, manner, scope or location of any activity shall require application for the modification of the permit or license.

C. Permit Non-transferable

No permit or license required by this Code shall be transferable to another person or premises and the holder of the permit or license shall notify the administering agency prior to any change in ownership or location of any permitted licensed activity.

D. Term Expiration

Each permit or license issued under the authority of this Code shall clearly state the date of issuance, the term of the permit or license, and the expiration date. The term of each permit or license issued under this Code shall be for a period not to exceed one (1) year unless the Director of the Planning and Zoning Department determines, for cause shown, that the permit or license should be issued for a period of time other than one (1) year; in which case, the Director may designate a lesser time when the activity can or will be fully completed within the shorter period, or may designate a greater time, but in no event more than three (3) years, subject to annual review and payment of any required fee, where the activity is reasonably known or contemplated for continuation beyond one year.

E. Renewal

Any permit or license issued under the authority of this Code may be renewed for one or more additional terms upon application for renewal filed with the Director of the Planning Department on a form authorized for that purpose. No permit or license which has been expired for more than thirty (30) days or which is subject to revocation, for any reason, may be renewed, and such permits or licenses may be reissued only upon the filing of a complete application for a new permit or license.

F. Error and Omissions

The issuance of a permit or license shall not prevent the administering agency from thereafter requiring the correction of errors in plans and specifications or from preventing construction activity being carried on there under when such activity would be in violation of this code or of any other code or resolution or from revoking any permit or license when issued in error. The Director of the Planning and Zoning Department may, in writing, suspend or revoke a permit issued under provisions of this Code whenever the permit is issued in error or on the basis of incorrect information provided by the applicant.

SECTION V. Standard Fees

For the purpose of defraying all or part of the cost of administration of this Code and to assist in the regulation of matters affecting the public health, there shall be and hereby imposes a standard fee for and upon the issuance and administration of any permit or license under this Code.

A. Double Fee for Unauthorized Practices

Any person who shall commence any activity for which a permit is required by this Code without first having obtained the permit shall, if subsequently permitted to obtain a permit, pay double the permit fee fixed by this section for such activity, provided, however that this provision shall not apply to emergency work when such work was urgently necessary to protect public health and safety and it was not practical to obtain a permit before commencement of such emergency work. In all such cases, a permit must be obtained as soon as possible after the performance of

such work, and if there is a delay of more than three (3) working days in obtaining such permit, a double fee as herein provided shall be charged.

B. Adjustments to Fee Schedule

The fees imposed under this Code may be adjusted or changed by Resolution adopted by the Board of County Commissioners, after publication notice and hearing, and upon adoption. The Director of the Planning and Zoning Department shall publish annually the applicable fee schedule and shall provide copies to all interested persons.

SECTION VI. Supplemental to State Regulations

The permits or licenses, and all fees, conditions and regulations imposed under this Section or any other Section of this Code shall be supplemental to and in additions to any permits, licenses, fees or regulations imposed or required by any other law, including those administered by the Kansas Department of Health and Environment.

SECTION VII. Administration of State Requirements

In the event that any rules, regulations or requirements arising under the Laws of the State of Kansas are assumed or administered through the jurisdiction of the Board of County Commissioners by the Planning and Zoning Department acting under any lawful executive or administrative order or pursuant to a contract agreement, whereby the jurisdiction of any state authority is delegated to or administered by the Planning and Zoning Department, then any permit or license issued or assumable by the State authority shall apply and shall satisfy the permit or license requirements imposed by this Section subject to the following conditions and exceptions:

A. Permit or License Fees

The permit or license fees imposed by this Section V, shall apply and be required for payment greater than or equal to any state imposed fees. The state-imposed fee shall apply whenever it is greater, but only one fee shall be imposed and required for payment.

B. Conflict in Regulations or Requirements

All rules, regulations, restrictions, and requirements of this Code shall remain in effect and shall apply to any activity or condition covered by this Code except when in direct conflict with a provision of the State rules or regulations, in which case the State-imposed rule or regulation shall apply. Terms and conditions, rules, requirements, regulations or limitations which are supplemental to those imposed by the State and which are not specifically or expressly excluded or prohibited shall not be considered conflicting and shall be imposed and in effect.

C. Additional Regulations

Rules, regulations, and requirements applicable to any conduct, activity, condition or standard which is not expressly regulated by the State law operation but which is regulated by this Code, shall be and remain in full force and effect as specifically applied under this Code for and within Leavenworth County, Kansas.

ARTICLE 4: INSPECTIONS AND INVESTIGATIONS

SECTION I. Inspections Required

Physical site inspections shall be authorized and performed for all permitted or licensed activities under this Code.

A. Construction Activity

Whenever plans and specifications are required by this Code to be submitted to an administering agency as part of a permit application, the agency shall inspect the premises prior to the start of operations to determine compliance with the approved specifications and with any other requirements of this Code.

B. Private Sewage Disposal Systems

Private sewage disposal systems shall be inspected by the staff of the Planning and Zoning Department prior to being placed in operation to ensure compliance with this code. Such systems shall be inspected thereafter as often as necessary to ensure compliance with this Code.

C. Repairs and Replacements

Any repair or replacement to a private sewage disposal system, which constitutes a structurally significant alteration, shall require a permit. (This includes septic tank replacement and replacement of or additions to absorptive laterals.) The alteration shall be inspected prior to undertaking and completing the repairs and replacements.

D. Minor Repairs and Emergencies

All minor repairs, which do not affect the structural integrity of the existing system, do not require pre-notification and permitting from the Planning and Zoning Department. Emergency repairs require notification of the Department within 24 hours.

SECTION II. Inspection Reports

A written inspection report shall be made for all inspections conducted under the authority of this Code, stating the name of the inspector, the date and time of the inspection, the type of inspection and the property inspected. The report shall enumerate all findings made during the inspection. Whenever a private sewage disposal system is inspected after a permit is issued, the findings of the inspector shall describe any determined violations, the Code section violated, and the correction to be made. A copy of the completed report shall be issued to the owner

of the premises and, if different than the owner, to the holder of the permit. The report is a public document.

SECTION III. Inspection Scheduling and Re-inspections

Whenever inspections are required under this Code to be scheduled for any installation, construction, initial activity, or for the correction of any violation or other non-conforming condition, it shall be the duty of the holder of the permit or license or the operation of the establishment to notify the administering agency and schedule the time and date for the inspection.

SECTION IV. Access and Right of Entry

The administering agency shall have the right to make inspections of establishments, premises, places and localities for the purpose of determining compliance with this Code. Inspections shall be done at a reasonable time. The agency may examine the water usage records of any establishment, which uses a private sewage disposal system for information pertaining to the amount of water used by the establishment. If the building, premises or establishment to be inspected is occupied, the agency representative shall first present proper identification and request entry; if such building or premises be unoccupied, he shall first make a reasonable effort to locate the owner, or other persons having charge or control of the building or premises, to request entry. If entry is refused, the agency shall have recourse to all remedies provided by law to secure entry. The agency shall have reasonable access to the business records of any person licensed to perform any activity under this Code where the records, daily logs, or other documents are reasonably necessary to determine compliance with the requirements of this Code.

SECTION V. Property Resale; Courtesy Inspections

Whenever any property connected to, or served by, a private sewage disposal system is offered for or subject to a contract of sale, upon the request of the property owner or contract buyer, the administering agency may provide a courtesy inspection, upon terms and at a fee cost established by the Director of the Planning and Zoning Department, to inspect and determine the condition of the system. Any inspection provided under this section shall be performed as a courtesy only and shall not constitute nor be deemed a warranty, and neither the administering agency nor any other official of the County or municipality shall be liable for any failures of the system or for other claims arising out of the inspection. Upon completion of the inspection, a letter shall be issued to the property owner reporting the results. Issuance of the letter shall not relieve a person of compliance with the requirements of this Code.

ARTICLE 5: ENFORCEMENT PROCEEDINGS

SECTION I. Emergency Orders

The Director of the Planning and Zoning Department, or other authorized code enforcement office or representative of the administering agency, may issue such orders or directives as he deems necessary upon a determination that such action is

required to prevent, contain or eliminate an obvious violation of this Code or an imminent threat to the health or safety of the public.

A. Health Risk

Whenever a duly appointed representative of an administering agency determines that a condition exists which requires immediate action to protect public health, he or she may, without prior notice or hearing, issue an emergency order stating the nature of the threat to public health and directing that action be taken as he may deem necessary to eliminate or minimize such condition. Notwithstanding any other provisions of this Code, such order shall be effective immediately upon issuance and shall be reduced to writing as soon as practicable.

B. Work Stoppage

Whenever any work is being performed on a private sewage disposal system contrary to the provisions of this Code, the administering agency representative may order the work stopped immediately by issuing an emergency order and serving it on any persons engaged in the doing or causing such work to be done, and any such person shall forthwith stop such work until authorized by the agency to proceed with the work.

C. Compliance

Any person, to whom an emergency order is directed shall comply therewith immediately, but upon written request filed within five (5) days of issuance, shall be afforded a hearing before a Hearing Officer as soon as possible. Such a hearing shall be held within ten (10) days of the issuance of such emergency order.

SECTION II. Suspension of Permit or License

The administering agency may suspend any permit or license that it issues if the holder thereof does not comply with the requirements of this Code. The suspension shall become effective ten (10) days after the holder of the license or permit, or the person in charge of such establishment or premises subject to the permit, receives written notice of such suspension. The holder or other aggrieved party may request a hearing in accordance with Section VI of this Chapter. After a hearing, the hearing officer may uphold the suspension as originally ordered or modify it as he sees fit, but in no event shall he enter an order of suspension for a period longer than that set out in the original order. Both the original order and any order entered after an appeal may condition the length of suspension upon correction of the conditions upon which the suspension is based.

SECTION III. Revocation of Permit or License

The administering agency may revoke a permit or license for serious or repeated violations of any of the requirements of this Code or for interference with the administering agency in the performance of its duties.

Prior to revocation, the administering agency shall notify, in writing, the holder of the license or permit, or the person in charge of the establishment or premises

subject to the permit, of the specific reason(s) for which the permit or license is to be revoked and that the permit shall be revoked at the end of the ten days following service of such notice unless a written request for hearing is filed with the regulatory authority by the holder of the permit or license within the 10-day period. If no request for hearing is filed within the 10-day period, the revocation of the permit becomes final.

Whenever a revocation of a license or permit has become final, the holder of the revoked permit or license may make written application for a new permit or license and pay the fee required.

SECTION IV. Abatement of Nuisances

Upon a determination by the County Health Officer or designee that a residence in the County is unfit for habitation due to unsanitary or unsafe conditions the County Health Officer or designee may place upon said residence, in a conspicuous location, a sign stating such. Prior to the placement of said sign, the County Health Officer or designee shall have, at a minimum, inspected the premises of the residence to determine if an unsafe or unsanitary condition exist and shall have provided to the owner or tenant of said residence a written notice of said unsafe or unsanitary conditions, said notice being provided not less than three days prior to the placement of the sign. (Resolution 1997-47) The removal or covering of said sign by any person other than the County Health Officer or designee shall be deemed a Class C misdemeanor and shall be punishable by a fine not to exceed $500.00 or thirty (30) days in prison, or both. The administering agency may maintain a civil action in injunction, in the name of the Board of County Commissioners of Leavenworth County, or any municipality in which this Code is applicable, to abate and enjoin a nuisance.

ARTICLE 6: APPEALS

SECTION I. Appeal for Hearing

Except as otherwise provided in Section V of this Article, any person aggrieved by any notice, final order, or denial of a permit or license by an administering agency if such person files with the agency within ten (10) days after the date of issuance of the notice, order, or denial a written request for a hearing setting forth the grounds on which the request is made. The filing of the request for hearing shall operate as a stay of any notice or order except in emergency order.

SECTION II. Hearing Officer

Every administering agency shall designate, in writing, one or more officials to act as that agency's hearing officer to hear appeals under this Code. The officer may be an employee of the agency but shall not be the person who, in the name of that agency, made the determination or issued the order upon which the appeal is based.

SECTION III. Conduct of Hearing

Upon receipt of the appeal request, the Hearing Officer shall set a time and place for a hearing, and shall give the petitioner written notice thereof. The hearing shall

be commenced not later than ten (10) days after the date on which the request for hearing was filed; provided, that upon request of the aggrieved party, the hearing may be postponed for a reasonable time beyond such ten-day period.

A record shall be made at the hearing, and the aggrieved party may be represented by counsel or other authorized person. The administering agency shall have the burden to sustain any notice, final order, or other decision subject to the appeal.

SECTION IV. Decision

Within ten (10) days after the conclusion of the appeal hearing, the hearing officer shall issue a written decision to the petitioning party. That decision may sustain, modify or deny the decision of the agency.

SECTION V. Proceedings of Hearings

A summary of all proceedings of hearing, including the findings and the decision of the Hearing Officer, together with a copy of every notice and order related thereto, shall be filed with the administering agency.

SECTION VI. Application of State Law Procedures

The appeal of any final decision action of the administering agency which is taken under the authority of a state administrative agency in application of the Laws of the State of Kansas shall be subject to and conducted in accordance with the Kansas Administrative Procedures Act, K.S.A. 77-501, et seq, and the provisions of that Act shall supersede any and all time limitations and procedures otherwise specified in this Code.

The Kansas Administrative Procedures Act shall not apply to any proceeding arising out of an appeal from any decision or action taken solely under the authority of the Board of County Commissioners or the governing body of any city.

ARTICLE 7: VIOLATIONS AND PENALTIES

SECTION I Unlawful Conduct

The following acts shall be unlawful:

A. Obstruction of Administering Agency

No person shall willfully impede or obstruct a representative of an administering agency in the discharge of these official duties under the provision of this Code.

B. Operation without a Permit or License

No person shall do any act or engage in any activity for which a permit or license is required by this Code unless first obtaining such permit or license. The existence of emergency conditions may be a defense to this provision.

C. Failure to Comply with Emergency Order

No person shall fail or refuse to comply with an emergency order of an administering agency issued under Article 5, Section I. Emergency Orders.

D. Failure to Comply with Permit or License

No person shall fail to comply with the specified terms or conditions of any permit or license issued under this Code nor do any act or engage in any activity or conduct regulated by this Code without a valid permit or license, nor continue activities or conduct subject to any permit or license which has expired, been suspended or been revoked under this Code.

E. Failure to Comply with Regulations

No person shall do any act or engage in any activity which is regulated by any Section or Chapter of this Code except as authorized and permitted under the Code, and no person shall knowingly operate any activity regulated by this Code in any manner which does not comply with the requirements of the conditions and regulation specified in this Code.

F. Falsification and Misrepresentation

No person shall falsify nor misrepresent any fact, information, product or data provided, required or submitted for any application, permit, license, inspection, examination, investigation, report, record, test or other determination required under this code.

G. Improper Discharges

No person shall cause nor permit any wastewater or sewage to be discharged to or upon the ground surface, the ground water, or other natural water course which creates or causes a health hazard or unlawful pollution, and no person shall cause nor permit any effluent from any private sewage disposal system to be so discharged, or to leak, seep or otherwise escape from the system such as to create or cause a health hazard or unlawful pollution. No cesspools, seepage pits and dry wells (rat holes) are allowed under this Code.

H. Failure to Repair or Correct

No person shall fail or refuse to repair or correct any defect, deficiency or other condition, whether natural or otherwise, in any private sewage disposal system which has caused, or which the Administrating Agency or its designees may determine is likely to cause, within reasonable certainty, any improper discharge or other health hazard, unsanitary condition, or unlawful pollution.

SECTION II. Penalties

Any violation of any provision or requirement of this Code or the commission of any unlawful act or conduct specified in this Chapter shall be deemed to be a Class C infraction under the Codes and Regulations of Leavenworth County, Kansas, and

punishable upon conviction by a fine of not less than $100.00 and not more than $500.00. Each day's violation shall constitute a separate offense.

SECTION III. Prosecution

The County Counselor shall prosecute violations of this Code in the name of the Board of County Commissioners of Leavenworth County, Kansas. Prosecution shall be commenced in the District Court of Leavenworth County, Kansas, unless a municipality adopting this Code provides otherwise for the prosecution of violations arising within municipal jurisdiction.

In that event, the City Attorney of the municipality adopting this Code may prosecute violations of this Code in the name of the city in the municipal court of that city.

CHAPTER 2

SEWAGE DISPOSAL

ARTICLE 1: GENERAL PROVISIONS

SECTION I. Purpose

Sewage is a potential source of disease and a potential hazard to the health, safety and welfare of the public. It also poses a direct threat to the environment as a potential pollutant of the air, water and soil, and presents a hazard to all forms of plant and animal life. It is the purpose of this Chapter to provide minimum standards for the sanitary disposal of all sewage generated or transported within Leavenworth County unless otherwise regulated by competent authority.

SECTION II. Scope

All sewage must be disposed of by the use of a sanitary sewer system as defined in this Section. A sanitary sewer system may be classified as either a public sewage disposal system or a private sewage disposal system.

SECTION III. Definitions

Unless the context requires or specifies otherwise, the following words, terms or phrases, as used in this Code, shall be given the meaning defined in this section.

A. Absorption System: A private sewage disposal system for the treatment of sewage by means of a leaching field and adjacent soil or by other means of absorption into the ground.

B. Absorption Trenches: One or more trenches of varying length and depth and of fixed horizontal separation in which effluent is percolated into the soil.

C. Aerobic Sewage Treatment System: A private sewage disposal system employing biological action, which is maintained by the addition of air or oxygen.

D. Aquifer: A subsurface water-bearing bed or stratum of sand, gravel, or bedrock which stores or transmits water in recoverable quantities or is capable of yielding water to, or transmitting water contaminants or pollutants to, wells or springs.

E. Bedrock: A soil horizon that contains greater than 50% consolidated material by volume.

F. Designer: A Professional Engineer duly licensed to plan or design private sewage disposal systems, including alternative systems, such as a mound, low-pressure pipe, or at-grade system, as well as conventional systems.

G. Distribution Box: A watertight chamber below the outlet level of a septic tank or treatment unit and from which effluent enters the absorption system.

H. Installer: Any person duly licensed to construct, install and/or repair private sewage disposal systems.

I. Holding Tank: A watertight receptacle constructed of concrete or other material, designed to receive, store and provide for periodic removal of non-water carried wastes from the human body.

J. Minor Repair: When used in reference to private sewage disposal systems, the term "minor repair" shall be defined as a replacement or repair of any solid pipe component of the system or the replacement or repair of septic tank components such as tees or baffles or such similar type of work as designated by the Director of the Planning and Zoning Department or his designee.

K. Mound system: An alternative aboveground system used to absorb effluent from septic tanks in cases where seasonally high water table zones, high bedrock considerations, slowly permeable soils, or limited land areas prevent conventional subsurface absorption systems.

L. Private Sewage Disposal: An on-site sanitary sewerage system serving every premise constructed or renovated for human occupancy after adoption of this Code shall be provided with at least one flush toilet. No human waste may be disposed of except in a flush toilet. Flush toilets must be connected to an approved sewage disposal system. Neither treatment facilities operated under a NPDES nor other state of federal permits, nor holding tanks serving commercial or industrial establishments are included in this definition.

M. Public Sewage Disposal System: An on-site sanitary sewer system which collects untreated or partially treated sewage from individual establishments or premises or recreational areas and transports it from the establishment or premises by means of pipes or conduits to a plant or location for treatment, and which is available for use by any person within the geographic area served by such a system. This includes, but is not limited to:

1. Systems built, served, or operated by public sewer districts and municipal sewer systems
2. Systems which are privately owned and operated but which are required to obtain a permit under the National Pollutant Discharge Elimination system (NPDES). This also includes non-discharge lagoons holding a Kansas Water Pollution Control Permit.

N. Sanitary Disposal Contractor: Any person duly licensed to perform sanitary disposal services.

O. Sanitary Disposal Service: The pumping out and removal of sewage from private sewage disposal systems and the transportation of such material to another location for treatment or disposal.

P. Septic Tank: An approved, watertight, accessible, covered receptacle designed and constructed to receive sewage in which three processes take place: settling of the solids, the digestion of some of the accumulated solids by anaerobic action, and separation of the floatable scum.

Q. Soil Mottles: Spots or streaks of contrasting soil colors that indicate the presence of a seasonal water table zone.

R. Structurally Significant Alteration (Major Repairs): When used in reference to private sewage disposal systems, the term "structurally significant alteration" means any of the following:

1. Replacement, repair or extension of any portion of the lateral field of the system; and/or
2. Replacement, repair or reconstruction of any one or more of the critical parts of the system, as designated by the Director of the Leavenworth County Planning Department, or his designee; and/or
3. Any replacement, repair or reconstruction, which upon review of the administering agency is determined to be an essential, repair in order to correct or prevent an improper discharge or imminent health hazard or unlawful pollution.

S. Trunk Line: The solid pipe from which the absorptive system extends in a septic tank system.

T. Water Table Zone: A zone in the soil, which is either continually or seasonally saturated with water.

SECTION IV. Rules of Application

The requirements established by Chapter II of the Leavenworth County Environmental Sanitary Code shall apply and be applicable to any and all private sewage disposal systems now or hereafter installed, used or operated upon any property located within Leavenworth County, Kansas subject to the provisions of this Code, and shall apply for regulatory purposes to holding tanks.

A. General Rule

Unless otherwise provided or excepted in accordance with this Section, from and after the effective date of the Code, no person shall design, install, replace, alter, repair, use or operate, nor cause or allow the installation, replacement, alteration, repair use or operation of any private sewage disposal system except as permitted under and as which complies with the established requirements of this Code. No commercial process wastewater shall be directed to a domestic soil absorption wastewater system. Surface runoff from roofs and paved areas, subsurface drainage from footing drains and sump pumps, and cooling water are not domestic wastewater and must be excluded for soil absorption systems. Such water may be used to maintain operating water level in wastewater ponds.

B. Existing Systems Treating Domestic Waste

Any private sewage disposal system lawfully installed prior to the effective date of this Code and used exclusively for domestic sewage, and not industrial nor commercial wastes, may remain in use if, and as long as, it continues to operate in accordance with the original design and location, does not experience any system

failure, and does not present any hazard to the public health, safety or welfare; however, any replacement, alteration, enlargement, repair, removal, conversion, improvement or demolition shall comply with the requirements of this Code or any later amendments, revisions or versions.

C. Existing Systems for Industrial and Commercial On-Site Wastewater Systems

1. Discharge of industrial or commercial waste to a soil absorption system is prohibited. Any such systems in effect at the time of passage of this code shall cease and desist immediately.
2. A sewage disposal system proposed or lawfully installed prior to the effective date of this Code which is used as an industrial and/or commercial on-site soil absorption wastewater system for domestic sewage only shall, within 120 days after the effective date of this Code, file an inventory form with the Kansas Department of Health and Environment and apply for an operating permit.
3. Industrial and/or commercial wastes collected and retained on site using above ground or underground holding tanks shall be subject to all Kansas Department of Health and Environment permit and inspection requirements, and shall comply with or satisfy all requirements and regulations now or hereafter adopted by the Kansas Department of Health and Environment, pursuant to Kansas Administrative Regulations, Article 28.
4. Subsection 2. Above, shall also apply to holding tanks.

D. Existing Tracts and Lots of Record

The owner of any unimproved land, which is a tract or lot of record on the effective date of this Code but which does not contain sufficient size or acreage to satisfy the minimum lot size requirements for any permit specified under this Code, may apply for and receive a permit under the applicable provisions of this Chapter if:

1. The tract or lot size is at least one (1) acre; and
2. The installation and use of the system shall be exclusively for Domestic Sewage and will comply with all other requirements of this Code; and
3. The lot is located in a plat which has received final plat approval on or before the effective date of this Code or the lot or tract is not platted but is duly recorded as a lot or tract of record prior to the effective date of this Code; and
4. The lot or tract is not located within the boundaries of any sewer sub district operation by Leavenworth County Unified Wastewater Districts or other municipalities; and
5. The application for a permit under this exception is filed with the Planning and Zoning Department on or before December 31, 2009. From and after December 31, 2009, all applications for a permit for a system treating Domestic Sewage, including those for existing lots and tracts of record, shall comply with the minimum lot size required to have systems designed by a licensed Professional Engineer (P.E.).

SECTION V. Variances

As of the adopted date of the Leavenworth County Sanitary, any person who owns a lot or tract of land which has been recorded or platted as a lot or tract of record prior to the effective date of this code may apply for and receive a variance from the minimum lot size requirements established by this Code for the installation, use or operation of any type of private sewage disposal system if, after inspection and evaluation, the code official of the Planning and Zoning Department determines that the system can and will comply with all other applicable requirements of this Code and the applicable zoning and subdivision regulations of the County. The Planning and Zoning Department shall adopt standards to apply in granting such variances. The request for a variance for the proposed system must be submitted prior to construction to remain in compliance with KSA 28-5-9.

SECTION VI. Rule Exceptions

The owner of any land or the user of any on-site sewage disposal system regulated by this Chapter may apply for an exception to any standard, specification, rule or regulation prescribed in this Chapter, which is not otherwise discretionary, under the authorities granted to the Director of the Planning and Zoning Department or other administering agency.

A. Application

Application for any rule exception under this Section shall be filed with the Director of the Planning and Zoning Department on approved and authorized forms and shall contain the following information:

1. The name of the applicant;
2. The name of the property owner if different than the applicant;
3. The address and legal description of the property;
4. The zoning and land use, existing and proposed, for the property;
5. The express rule, regulation or requirement for which exception is sought;
6. A detailed description of the plan, action, or other specification, which is proposed in alternative to the rule or requirement.

B. Application Fee

There shall be and hereby is imposed a fee of fifty dollars $50.00 for and upon each application for a rule exception filed under this Section. The fee shall be charged and paid for each separate tract, lot or sub-part of a tract or lot subject to the application and for each rule, regulation or requirement for which exception is sought.

C. Report and Recommendation

Upon receipt of any application for a rule exception under this Section, the Director of the Planning and Zoning Department or his designee shall evaluate the application and may conduct such site inspections or other investigations as he deems appropriate, and may require, the applicant to submit additional facts,

information or tests as may be reasonably necessary to render a decision on the application. The Director or his designee shall prepare a report and recommendation on the application within seven (7) days after receipt of the application and of all required additional information. A copy of the report and recommendation shall be sent to the applicant, to any appropriate planning or governmental body, to the Leavenworth County Board of County Commissioners, and to any other interested person or party.

D. Final Decision

The report and final recommendation of the Director, or his designee, shall be and become the final decision on the application unless, within fourteen (14) days after the date of the report and final recommendation, the applicant or other interested party or governmental body requests in writing a formal review of the application or final recommendation. Any final decision of the Director, or his designee, shall be issued in the form of a written administrative order, and the order shall be certified and recorded with the County Register of Deeds.

E. Review Proceeding

Whenever a timely request for review of any application or final recommendation is filed with the Planning and Zoning Department, review proceeding shall be conducted in accordance with this subsection.

1. Review of Design, Specifications, or Standards
   If the application requests an exception to any design criteria or technical specification or standard required under this Article, then the review shall be conducted by the Board of Code Review shall hold its meeting to consider the application or recommendation within fourteen (14) days after a request for review is filed with the Planning and Zoning. Notice of the meeting shall be provided in writing to the applicant, the party seeking review, the Director, and any other interested person or governmental body.
2. Review of Land use Considerations
   If the application requests an exception to any land use consideration, including but not limited to minimum lot sizing, then the review shall be conducted by the Board of County Commissioners. A notice stating the exception requested and the date, time and place of the review proceeding shall be published by the applicant in a newspaper of general circulation in the area where the site is located at least seven (7) days, but not more than fourteen (14) days, prior to the proceeding date. A copy of the notice shall be mailed by the applicant to the owner of any property located within 1000 feet of the site location and to any appropriate planning or governing body at least seven (7) days prior to the date set for the review proceeding.

F. Standards for Review

The report and recommendation of the Director, or his designee, shall be given substantial deference upon any review, but the person applying for any rule exception shall have the responsibility, in all instances, to demonstrate that the

exception is justified and necessary. No rule exception shall be granted, either by final decision of the Director, or his designee, or upon any order of a review proceeding unless it is found and determined that:

1. The rule or requirement for which an exception is sought cannot practically be met as applied to the property without extreme and undue hardship; and
2. The rule exception will not adversely affect the proper and efficient operation of the private sewage disposal system nor require extraordinary monitoring, care or maintenance; and
3. The system as proposed will comply with all other applicable rules, regulations or requirements and will not cause nor result in any identifiable risk to the environment or public health.

C. Decision on Review

The decision in any review proceeding authorized in this Section shall be issued, in writing, within seven (7) days after completion of all review proceedings. A copy of the final decision shall be certified and recorded with the County Register of Deeds. Any final decision on any application for a rule exception under this Article shall be solely within the discretion of the Director or the reviewing board and shall not be subject to review by nor overturned in any court or other jurisdictional body in the absence of demonstrated fraud or deliberate, capricious action.

ARTICLE 2: PUBLIC SEWAGE DISPOSAL SYSTEMS

SECTION I. Regulation of Municipal or Public District Systems

Any public sewage disposal system, which is maintained and operated by a municipality, by a lawfully created public sanitary sewer district, or by a lawfully organized public improvement district authorized under application of the Laws of the State of Kansas or the United States and located in whole or part within Leavenworth County, Kansas, shall be built and operated only as permitted by the rules and regulations of the Kansas Department of Health and Environment and the United States Environmental Protection Agency and shall comply with and be governed by such laws, rules, regulations and administrative actions.

SECTION II. Privately Owned NPDES Systems

Any sanitary sewage disposal system which is maintained and operated by any private person, pursuant to a national Pollutant Discharge Elimination System (NPDES) permit issued by any federal or state authority, or which by law would be required to obtain such permit, and which is located within Leavenworth County, Kansas, shall comply with and be regulated by the terms and conditions of the permit and all rules, regulations and requirements imposed by the applicable federal or state regulatory authority. Any system covered by this Section shall operate within Leavenworth County, Kansas, only pursuant to a valid and effective NPDES Permit or Kansas Water Pollution Control Permit, and no person shall build, maintain or operate any such system without valid permits.

SECTION III. Systems Serving Commercial or Industrial Users

Every premises or property which is used as or occupied by a commercial or industrial establishment and which is not connected to a public sewage disposal system as identified by Section I or Section II of this Article must install, use, and maintain a holding tank facility, and no other type of on-site sewage disposal system, for sewage disposal (except as provided in Section IV of Article 1 of this Chapter). The holding tank facility shall meet the specifications and requirements of Article 8 of this Chapter.

ARTICLE 3: PRIVATE SEWAGE DISPOSAL SYSTEMS

SECTION I. Types

All private sewage disposal systems shall be viewed and approved for use by the Planning and Zoning Department before put into use. All abandoned or unused septic tanks, cesspools, seepage pit or other holes that have received wastewater shall be emptied and plugged following procedures described in K-State Research & Extension bulletin MF-2246.

Private Sewage Disposal Systems are classified as being one of the following systems:

1. Septic Tank/Absorption Field
2. Aerobic (Activated Sludge)
3. Mound System
4. Sanitary Privy
5. Holding Tank
6. Other

SECTION II. Proper Maintenance and Operation

All private sewage disposal systems shall be maintained in good working condition and shall not discharge onto the surface grade, or into the groundwater, or drain into any stream, or roadside ditch, or produce any offensive odors; or become a breeding place for flies, mosquitoes or rats and other disease vector. Surfacing of effluent in pools or streams or groundwater contamination will indicate system failure. Whenever the administering agency shall find any private sewage disposal system malfunctioning and causing any prohibited condition, it shall order the owner and/or user to correct the condition within thirty (30) days.

SECTION III. Location of a Private Sewerage or Private Sewage Disposal System within One Hundred (100) Feet of Well

A. No portion of a private sewage disposal system shall be located within one hundred (100) feet of a water well or a pump suction line from a water well.

B. No water line shall extend through a septic tank absorption field.

SECTION IV. Connecting to Public Sewage Disposal Systems

To the extent feasible, public sewage disposal systems shall be used for the disposal of all sewage within Leavenworth County, and no private sewage disposal system shall be permitted under this Chapter whenever a public sewage disposal system is available to serve the property. Any property served by a private sewage disposal system authorized under this Chapter shall connect to a public system as provided in this Section.

A. Existing Systems

After the effective date of this Code, no permit for construction or for a structurally significant alteration of a private sewage disposal system shall be issued for any lot or tract of land any part of which is located within 660 feet of a main or lateral sewer line, which is part of a public sewage disposal system which can serve the lot or tract, and when it is determined that connection to the public system is feasible and reasonably available to the property owner.

B. New Systems

The use of any private sewage disposal system for which a permit to construct was issued after the effective date of this Code shall be prohibited two years after a main or lateral sewer line first becomes available for service within 660 feet of the lot or tract served by the private sewage disposal system, and when it is determined that connection to the public system is feasible and reasonably available to the property owner.

C. Extensions or Waivers

The requirement for connection to a public sewage disposal system, as in Section IV. B. New Systems, may be waived, or the time extended, by official action of the Board of County Commissioners, or other applicable governing body. The conditions for this would be undue hardship or for compelling cause.

SECTION V. Repairs and Corrections

Any private sewage disposal system, which, for any reason, does not function properly as designed and permitted, shall be replaced or repaired. Plans and specifications for the replacement or repairs shall be submitted to and reviewed by the administering agency, and no repairs or replacements, other than ordinary maintenance, shall be performed without a permit and inspection as required under this Code.

ARTICLE 4: REGULATIONS FOR SEPTIC SYSTEMS

SECTION I. Permits Required

It shall be unlawful for any person, firm, or corporation to erect, construct, perform any structurally significant alteration, remove, convert, or demolish any septic tank system regulated by this Code, without first obtaining a septic system permit from

the Planning and Zoning Department. Permits issued under this Article shall be subject to the following qualification.

A. Property Use

Permits may be issued under this Article only for single-family residences or duplexes, where each unit is occupied as a residence and where each unit shall be served by a separate septic tank and system.

B. Minimum Lot Size

Unless a waiver or rule exception is granted pursuant to Article 1 of this Chapter, a minimum lot or tract size of 2.5 acres per living unit shall be required for any permit issued under this Article.

C. Transfer

A permit issued under this Article shall not be transferable.

D. Standards

No permit shall be issued to any person, property, or establishments, which does not comply with and satisfy the specified requirements of all applicable section of this Article.

SECTION II. General System Requirements

Every premise requires at least one approved flush toilet. The system shall be designed to consist of a building connection, treatment unit such as a septic tank, and disposal field. The system shall receive all domestic sewage including laundry waste. Use of a distribution box is optional. The design of the system shall ensure that the wastes discharged from the private sewage disposal systems:
A. Do not contaminate any drinking water.
B. Are not accessible to insects, rodents or other possible carriers of disease, which may come in contact with food or drinking water.
C. Do not contaminate the waters of any bathing beach or streams used as a water supply or for recreational purposes.
D. Do not surface above ground level.
E. Are not a danger by being exposed and accessible to animals or people.
F. Do not give rise to a nuisance due to odor or unsightly appearance.
G. There shall be no permanent structure (patio, building, driveway, etc.) over the Tank, lateral or other part of an onsite wastewater system.

SECTION III. Application Procedures

The person applying for the septic system permit shall first file an application in writing on a form furnished for that purpose by the Planning and Zoning Department. The application shall:

A. Identify and describe the activity for which permission is requested. (e.g., construction, repair, etc.)

B. Identify the location of the activity for which permission is requested by legal description and street address.

C. Indicate the type of establishment, which the septic system will service (e.g., single family residential, commercial, etc.).

D. Be accompanied by a soil percolation test with a drawing of the proposed septic system. The soil percolation test regimen is described in Section VIII of this Article. A soil profile analysis may also be required by the Administrative Agency as in Section IX depending on soil type and other considerations.

E. Soils with limitation such as bedrock, ground water, slope, or administrative requirements require a design plan drafted and stamped by a licensed professional engineer (P.E.), licensed to design onsite wastewater systems in Leavenworth County. The application must be accompanied by two (2) sets of plans and specifications as defined in Section IV of this Article.

F. Be accompanied by a set of building blueprints, including site elevations (front, side and rear).

G. Be signed by the owner of the premises where the activity is to be conducted, or his or her duly authorized representative. The representative may be required to submit evidence of such authority.

SECTION IV. Plans and Specifications

Plans and specifications, shall be drawn to scale, no greater than one inch to fifty feet (1"=50'), and shall include but not be limited to the following information:

A. Location of the soil profile sites or percolation tests for the sewage disposal system.

B. Size of lot, dimensions, and relative location of structures.

C. Proposed location of the sewage disposal system for a total of 5,000 square feet.

D. Proposed location of a replacement area for the sewage disposal system consisting of at least 5,000 square feet, or a total set aside of 10,000 square feet for the system.

Retention of Plans: One set of approved plans shall be retained by the Leavenworth County Planning Department and one set of approved plans shall be returned to the applicant.

SECTION V. Inspections Required for System Approval

No septic tank or system shall be placed into service and no person may use any establishment connected to such system until the system has been inspected and approved by the Director of the Planning Department or his designee.

A. Pre-Conditions

No inspection or system approval will be initiated until and unless the applicant or property owner has fully complied with the permit and application requirements of Section I and Section III of this Article. Any required permit must be posted and displayed at the property job site.

The applicant or property owner shall provide a minimum of one working day's notice to the Planning and Zoning Department to perform any required septic system inspection. An inspection will be conducted only when proper notice is given, only where the site address is posted and visible from the road, and only where the foundation is finished before installation of the system.

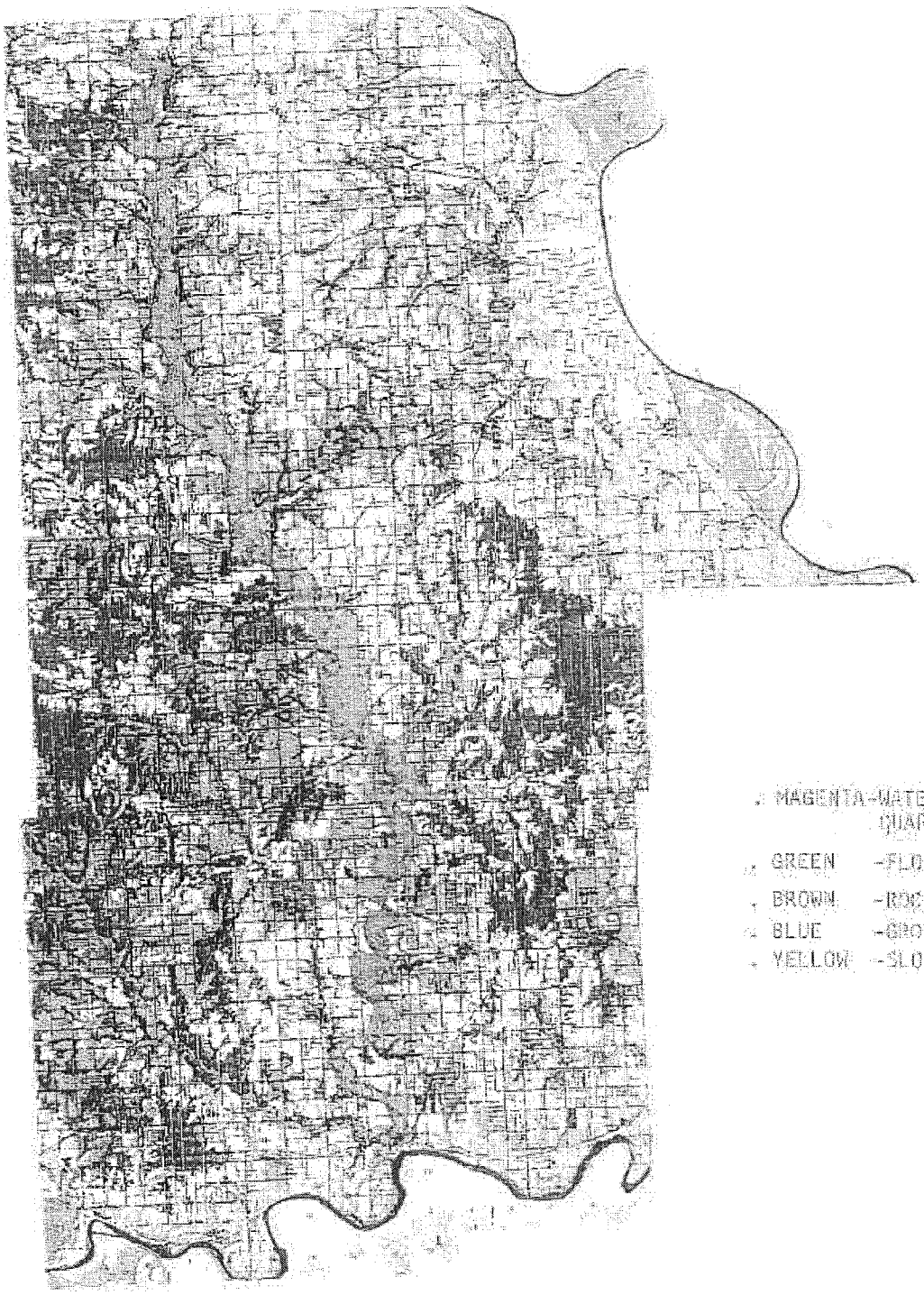
B. Inspection Procedures

There may be at least three (3) separate inspections required for each septic each septic system.

The first site inspection shall be performed before issuance of any septic system permit and includes the following:

1. Verification of predominant soil type by digging a minimum of three soil percolation test holes and one hole seven feet in depth approximately four feet square. If the soil type and conditions and or the soil percolation rate, indicate a standard septic system is not suitable, then an engineer designed wastewater system may be required. Four feet of aerated soil below the bottom of the absorption field is necessary for a standard septic system.

SOILS LIMITATIONS MAP



See chart below for soil suitability by type.

SOIL SUITABILITY CHART

Map Symbol	Map Unit name	STANDARD SEPTIC TANK/ LATERAL	LIMITATION	G/SqFt LOAD RATE
4350	Chase silty clay loam	NO	Slow Perc	*
7005	Bourbonais-Bismarckgrove Complex	NO	Flooding	*
7006	Bismarckgrove silt loam	NO	Flooding	*
7035	Eudora-Bismarckgrove fine sandy loams	NO	Flooding	*
7036	Eudora-Bismarckgrove silt loams	NO	Flooding	*
7050	Kennebec silt loam	NO	Flooding	*
7051	Kennebec silt loam	NO	Flooding	*
7055	Kimo silty clay loam	NO	Flooding	*
7061	Muscotah silty clay loam	NO	Slow Perc	*
7087	Sarpy-Haynie Complex	NO	Flooding	*
7088	Stonehouse sand	NO	Flooding	*
7089	Stonehouse-Eudora fine sandy loams	NO	Flooding	*
7090	Wabash silty clay loam	NO	Bedrock	*
7091	Wabash silty clay	NO	Bedrock	*
7095	Kiro silty clay	NO	Flooding	*
7099	Zook silty clay	NO	Flooding	*
7105	Belue silt loam	NO	Flooding	*
7106	Eudora-Bismarcgrove silt loams	Yes		.6
7107	Bismarchgrove-Kimo comples,	YES		.4
7120	Eudora complex	YES		.6
7123	Eudora silt loam	YES		.6
7132	Stonehouse-Eudora complex	YES		.6
7150	Haig silty clay loam	NO	Slow PERC	*
7155	Kimo silty clay loam	NO	Slow PERC, Ponding	*
7170	Reading silt loam	NO	Slow PERC	*
7176	Rossvile silt loam	YES		.4
7208	Muscotah silty clay loam	NO	Slow PERC	*
7210	Basehor complex	NO	Slope, sandstone	*

7211	Bremer silty clay loam	NO	Waterlog, ponding	*
7214	Eudora silt loam	YES		.6
7219	Basehor-Elmont complex	NO	Slope, Sandstone	*
7234	Elmont silt loam	YES		.4
7236	Elmont silt loam	YES		.4
7250	Gosport-Sogn complex	NO	Slope rock	*
7252	Grundy silty clay loam	NO	Slow PERC, waterlog	*.2
7254	Grundy silty clay loam	NO	Slow PERC	*.2
7256	Grundy silty clay loam	NO	Slow PERC	.3
7262	Gymer silt loam	YES		.2
7270	Falleaf-Grinter soils	NO	Seepage	*.4
7271	Falleaf-Grinter soils	NO	Seepage	*.4
7285	Ladoga silt loan	YES		.4
7290	Marshall silt loam	YES		.4
7291	Marshall silt loam	YES		.4
7292	Marshall silt loam	Yes		.4
7301	Martin silty clay loam	NO	Slow PERC	*
7302	Martin silty clay loam	NO	Slow PERC	*
7303	Martin silty clay loam	NO	Slow PERC	*
7305	Martin silty clay loam	NO	Slow PERC	*
7423	Morrill clay loam	NO	Slow PERC	*
7424	Morrill clay loam	NO	Slow PERC	*
7431	Morrill clay loam	NO	Slow PERC	*
7440	Morrill-Gravelly Land complex	NO	Slow PERC	*
7450	Olmitz clay loam	NO	Slow PERC	*
7460	Oska silty clay loam	NO	Bedrock	*
7461	Oska silty clay loam	NO	Bedrock	*
7502	Pawnee clay loam	YES		.2
7503	Pawnee clay loam	YES		.2
7506	Pawnee clay loam	YES		.2

7507	Pawnee clay loam	YES		.2
7508	Pawnee clay loam	YES		.2
7526	Chillicothe-Oska silty clay loam	NO	Slow PERC	*
7540	Sharpsburg silty clay loam	YES		.2
7542	Sharpsburg silty clay loam	YES		.3
7550	Rosendale-Bendena silty clay loams	NO	Slow PERC, Bedrock	*
7555	Saroxie silty loam	NO	Slow PERC	*
7575	Shelby clay loam	YES		.3
7576	Shelby clay loam	YES		.3
7588	Shelby loam	YES		.3
7589	Shelby loam	YES		.3
7590	Shelby loam	YES		.3
7591	Shelby-Pawnee complex	YES		.3
7592	Shelby-Pawnee complex	YES		.3
7602	Sibleyville complex	NO	Depth to Bedrock	*
7604	Sibleyvilel loam	YES	Rock	*
7659	Vinland-Sibleyville complex	NO	Bedrock, slope	*
7665	Vinland-Sibleyville complex	NO	Bedrock, slow PERC	*
7666	Vinland-Sibleyville complex	NO	Bedrock, slope	*
7667	Vinland-Rock Outcrop complex	NO	Bedrock, slope	*
7672	Walluala-Vinland complex	NO	Slow PERC, Bedrock	*
7674	Welda silt loam	YES		.3
7675	Welda silt loam	NO	Slope	*
7741	Haynie silt loam	NO	Subject to flooding	*
7743	Haynie-Onawa complex	NO	Subject to flooding	*
7760	Onawa and Waldron silty loams	NO	Flooding, ponding	*
7761	Onawa loam	YES		*.2
7763	Onawa silty clay loam	YES	Seasonal High	*.2
7764	Onawa soils	NO	Flooding, slow PERS	*
7765	Onawet silty clay loam	NO	Flooding slow PERC	*

7790	Wathena-Haynie complex	NO	Flooding, slow PERC	*
7850	Judson silt loam	YES		.4
7906	Armster clay loam	YES		.4
7907	Armster clay loam	YES		.2
7910	Armster clay loam	YES		.2
7911	Armster clay loam	YES		.2
7913	Armster clay loam	YES		.2
7950	Gosport complex	NO		*
7951	Gosport silty clay loam	NO		*
7955	Knox silt loam	YES		.4
7956	Knox silt loam	YES		.6
7957	Knox complex	NO	Slope	*
7958	Knox silty clay loam	YES		.4
7959	Knox-Gosport complex	NO	Slope	*
7970	Palermo silty clay loam	NO	Slope	*
7971	Palermo-Knox complex	YES		.4
9971	Arents, earthen dam			
9980	Fluvaquents, ponded			
9982	Fluvents, frequently flooded			
9983	Gravel pits and quarries			
9984	Made land			
9986	Miscellaneous water			
9999	Water			

*Designed by Professional Engineer

2. Performance review of three percolation test holes and review of soils recommendation according to latest addition of the web Soil Survey (WSS) by the United States Department of Agriculture Natural Resources Conservation Service. Inspection of deep hole will determine depth to bedrock and ground water.

3. Inspection of the proposed area for the size requirement of an additional replacement system.

The second inspection is made when the system is installed. The tank and pipe shall be in the ground but must be uncovered for the inspector to check the following:

1. Tank size and inside structure, including the inlet and outlet baffles or tees.
2. Depth of gravel in laterals.
3. Level and depth of pipes
4. Trunk line on undisturbed soil.
5. Anticipated depth of fill over laterals
6. Quality of all construction materials to assure compliance with minimum standards set forth by the Planning and Zoning Department.
7. A sketch of the wastewater disposal system as constructed, showing measurements shall be make and delivered to the homeowner, and filed with the permit.

The third inspection is made after final grading has occurred, but before occupancy. The inspector will check for the following:

1. Depth of soil cover over septic tank (not to exceed 24 inches).
2. Depth of soil cover over lateral lines.
3. Contour of soil to assure allowance for water diversion around lateral field.

SECTION VI. Septic Tanks

A. Minimum Design and Construction

Septic tanks shall be approved by the State of Kansas and materials and construction certified by the State of Kansas.

The distance from the top of the tank and the liquid line shall be at least twenty (20) percent of the liquid depths.

A cleanout, with a four (4) inch diameter, shall extend to the surface from each compartment of the septic tank. Each cleanout shall be equipped with a tight-fitting, lockable cap consisting of 3/8" bolts or a chain and padlock, or secured by 2 screws that are rust proof. Water tight manhole covers may be used.

The septic tank including all extensions to the surface shall be watertight to prevent leakage into or out of the tank.

The tank shall be structurally sound and made of materials resistant to corrosion from soil and acids.

Steel tanks are not acceptable.

Septic tank liquid depth must be at least three feet but shall not exceed six-and-one-half feet.

The effective inside length of tanks shall not be less than one-and-a-half not greater than four times the effective inside width.

The inlet and outlet baffle or tee and compartment baffle shall extend above the liquid level to one inch below the top of the tank.

The invert of the inlet pipe shall be located at least three inches above the invert of the outlet when the tank is level.

Septic tanks shall be watertight.
Tow piece tanks that are assembled on-site must be tested following placement but before backfilling.

A single compartment septic tank is acceptable.

B. Compartment

A single compartment septic tank is acceptable. A two-compartment septic tank shall meet the following criteria:

1. The inlet compartment shall have approximately two-thirds of the total capacity of the tank. The second compartment shall have a capacity of not less than 400 gallons.
2. Partitions or baffles between compartments shall be of durable material and shall extend not less than four (4) inches above the liquid level. An inverted fitting equivalent in size to the tank inlet, but in no case less than four (4) inches in size, shall be installed in the inlet compartment side of the baffles with the bottom of the fitting placed midway in the depth of the liquid.
3. Venting between compartments must be provided.
4. Baffles shall be made of fiberglass, acid-resistant concrete, or other materials approved by the State of Kansas.

C. Capacity

Septic tanks shall have a minimum of 1200 gallons capacity for residences with 1, 2, or 3 bedrooms; 1500 gallons capacity for residences with 4 or 5 bedrooms; residences with more than five bedrooms will be sized on an individual basis. Larger septic tanks for special conditions may be required when reason and justification are furnished.

D. Location

The septic tank shall be located as set forth in Table 1. No septic tank shall be installed within:

1. Ten (10) feet of a house or structure if set below the lowest floor, including basement floor
2. Fifteen (15) feet or more if set above the lowest floor, including basement floor
3. Ten (10) feet of a property line, absorption trench, driveway, or foundation drain.
4. Fifty (50) feet of any stream, or cistern

5. Fifty (50) feet of any pond, or water main
6. Twenty-five (25) feet of any water service line
7. Slope greater than 15%
8. One hundred (100) feet of a Regulatory floodway
9. I area's subject to high water table or seasonally high water table, plastic and fiberglass tanks shall not be used unless precautions are taken to drain groundwater.

The administrative agency, after site inspection, may stipulate greater separation than cited herein, due to adverse on-site conditions, including location of a well on-site or nearby; site configuration or structural placement; subsurface soil characteristics and/or groundwater interference.

E. Foundation and Backfill

Septic tanks shall be constructed or installed level on a foundation that will prevent settling. Backfill shall be free of voids, stumps, broken masonry, or other such materials. The lid of the tank shall be covered with earth. Tank hole shall provide ample space around the tank for access to do compaction. Backfill shall be uniform, compacted layers not exceeding two feet thick and surround the tank. On unsuitable natural soil, thanks shall be placed on a bed at least four inches of sand, pea gravel, or crushed non-corrosive granular material. Material shall be no larger than two inches in diameter. Bed depth shall be at least four times the largest material diameter.

TABLE 1: REQUIRED DISTANCE FROM THE SYSTEM

	SEPTIC TANK	LATERAL FIELD
PROPERTY LINE	10 FEET	10 FEET
WELLS	100 FEET	100 FEET
POND, LAKE OR STREAM NOT USED FOR DRINKING WATER	50 FEET	50 FEET
WATER LINE	25 FEET	25 FEET
BUILDING	10 FEET	25 FEET
DITCH OR CUT		20 FEET

F. Capacity

The liquid capacity of a septic tank serving a dwelling shall be based primarily on the number of bedrooms in the dwelling served and shall conform to capacities given in the following table

TABLE 2: BEDROOM/TANK CAPACITY RATIOS

NO. OF BEDROOMS	1	2	3	4	5	*
CAPACITY (GALLONS)	1200	1200	1200	1500	1500	

* In the event that any installation serves more than a six-bedroom or its equivalent, or serves a facility other than a home the equivalent of twelve persons or more, approval of septic-tank capacity and design must be obtained from the Leavenworth County Planning and Zoning Director.

G. Lateral Size

All laterals shall be sized in accordance with the results of the soil profile test to determine the rate of absorption for the trench bottom area. (Refer to Tables 3 and 4.) The number of square feet of materials to be installed will be determined by the results of the test which indicates the greater number required. On standard septic systems, when using a chamber system, the required lateral may be reduced by 40%.

TABLE 3: BEDROOM/LOAD RATE/SQUARE FOOTAGE REQUIREMENTS

WASTEWATER LOAD RATE (gpd/ft2)	TWO-BEDROOM	THREE-BEDROOM	FOUR-BEDROOM	FIVE-BEDROOM
0.8	1000	1200	1300	1625
0.6	1100	1300	1400	1750
0.5	1200	1400	1600	2000
0.4	1300	1500	1800	2250
0.3	1400	1600	2000	2500
0.2	1600	2000	2500	3000

TABLE 4:GUIDE TO ESTIMATING WASTEWATER INFILTRATION RATES FOR BELOW-GRADE SOIL ABSORPTION SYSTEMS

SOIL HORIZON CHARACTERISTICS	WASTEWATER LOADING gpd/ft2
1. Gravelly coarse sand; moderate or strong platy structure; sandy clay loam or silty clay loam with weak platy structure; cemented consistence or any consistence stronger than firm moist), orchard (dry); sandy clay, clay or silty clay with massive or weak structure; silt loam, clay loam or silty clay loam with massive structure.	0.0
2. Sandy clay, clay or silty clay of low clay content with moderate or strong structure; sandy clay loam, clay loam or silty clay loam with weak structure.	0.1-0.2
3. Sandy clay loam, clay loam or silty clay loam with moderate or strong structure; sandy loam, loam or silt loam with weak structure.	0.3-0.4
4. Sandy loam, loam or silt loam with moderate or strong structure; fine sand, very fine sand, loamy fine sand or loamy very fine sand.	0.5-0.6
5. Coarse sand, sand, loamy sand or loamy coarse sand with single-grain structure.	0.7-0.8

D. Lateral Trench

The acceptable lateral trench width shall be from 24 inches to 36 inches with the following minimum distances between trenches observed:

TABLE 5: DISTANCES BETWEEN TRENCHES

Trench Width	Minimum Distances Between Center line of Trenches
24 - 36	9.0 feet

An approved standard trench pipe (Schedule 35 or better rigid PVC for inlet pipe and tight line and 3000# crush for perforated line in the absorptive trench) shall be used. The sewer line from the house to the tank, all fittings and pipe in the tank, all extensions to the surface from the top of the tank and fist 10 feet exiting the tank shall be schedule 40 pipe of heavier. Perforations are to be circular, ½ diameter, positioned at four at four and eight o'clock. Slotted pipe is not acceptable. The ends of each lateral shall be capped. There shall be a minimum of 4" of slope from outlet end of the tank to the first lateral. Individual trenches shall have a maximum slope of 4 inches per 100 feet. Individual trenches shall have a maximum length of 100 feet. Drainage lines shall be installed on top of at least 6 inches of washed gravel or other approved medium. This gravel or medium shall be nominally sized at 3/4" with 98% of the gravel or other medium being retained on a 1/2" screen and 100% passing through a 1 & 1/2" screen. There is to be no more than a slight amount of particulate matter. The Planning and Zoning Department shall approve materials that will be placed over the gravel before backfilling. Serial or "step-down" distribution may be required for excessively sloping absorptive fields. Valves or drop boxes may be required on all serial distribution systems. Depth of absorptive trenches will be 24 to 30 inches. Use at least 6" of medium below the distribution pipe with sufficient medium to cover over the pipe by 2 inches. At least 12" of backfill dirt will be placed over the medium, pipe, and a geotextile barrier material (at least 3 once nylon or 5 ounce polypropylene nonwoven filter fabric) covering material placed over the gravel or other medium.

I. Lateral Field

No septic tank lateral field or any portion thereof shall be placed in filled material unless approved by the administering agency.

No part of the lateral field shall be covered by more than eighteen (18) inches of backfill.

Soil must the septic tank effluent, treat the wastewater, and transmit treated wastewater away from the soil absorption areas.

Some method of detection or location of the system components shall be used.

The lateral field shall not be subjected to an additional source of water such as a lawn sprinkler system or irrigation system.

J. Site Preparation

The area proposed to be occupied by the private sewage disposal system shall not be disturbed or compacted prior to system installation. Fencing or other appropriate barriers are recommended to designate these areas. During and after installation, care shall be taken to avoid excessive compaction or destruction of the soil profile.

SECTION VII. Applicable Building Codes

In addition to the standards and requirements established under this Chapter, the installation, alteration, construction, reconstruction, repair, replacement, or other work for or upon any private sewage disposal system regulated under this Code

shall comply with and satisfy the specifications and requirements, whenever applicable, of the Uniform Building Code and the Uniform Plumbing Code, or similar codifications, as adopted by and in effect in Leavenworth County, Kansas, or other codes or ordinances, as adopted by any city adopting this Code. The administering agency shall have available copies of any such codes and code specifications and shall delineate those parts and requirements, which are applicable to private sewage disposal systems. All materials used in the plumbing, wastewater line, and lateral fields shall meet standards specified by ASTM (American Society for Testing and Materials International).

SECTION VIII. Soil Percolation Tests

Soil percolation tests will be utilized in conjunction with soil profiles to determine the suitability of the soil for a standard septic tank/lateral system. Licensed installers to verify soil types described in Web Soil Survey of Leavenworth County, Kansas shall conduct percolation tests. Absorptive laterals will be sized according to Table 3. A deep hole (minimum 2' Wide) 7'to 8' in depth shall be dug and be open for 24 hours. Check deep hole for ground water or bed rock. The deep hole is used to determine deep to bedrock or ground water.

A. Soil Percolation Test Procedure

The soil percolation tests shall be conducted on undisturbed soil only, according to the following guidelines. There shall be no grading, either cut or fill, after the soil percolation test has been made, which might alter the percolation rate.

1. A minimum of three holes must be dug in the area where the lateral field is proposed. The holes must be at least fifty (50) feet apart, and must be six inches in diameter and dug to a depth of the proposed lateral system (ideally 24 to 30 inches).
2. The sides of the holes shall be roughed up with a shovel or other object to remove any polished soil surface, to allow a natural area for percolation. Remove all loose dirt and other materials and make the bottom as level as possible.
3. Twenty-four (24) hours before the test is to be run, the hole shall be filled with clear water and be kept full of water to swell and saturate the surrounding soil areas. The purpose of this is to duplicate the most extreme conditions under which the system is to function. Also, if this procedure is followed properly, the test will give comparable results in wet or dry seasons.
4. After the soil has been kept saturated for 24 hours, add enough water to attain a depth of fifteen (15) inches. Take an additional depth reading from a fixed point on the sidewall of the test hole. Take readings each hour for four hours as the water evacuated the hole. If all the water drains out before the end of four hours, recharge with water and continue to take readings through the four-hour period.

B. Calculating Perc Rate

1. List the total drop recorded in each of the holes.

2. Add the total and divide by 3 (or the number of holes). This gives the average fall of the holes.
3. Divide the average fall rate into 240 (# minutes in 4 hours). This gives perc rate in minutes per inch.
4. In Leavenworth County a percolation rate of 50 minutes or less per inch qualifies for a standard septic tank/lateral field. If the number is higher, the owner may qualify for a waste stabilization pond (lagoon) or a special system that is designed by a licensed Professional Engineer.

SECTION IX. Soil Profile Procedure

Sometimes subsurface profiles are necessary to determine the existence and location of formations and to determine the suitability of the soil for a septic tank system. Persons conducting the soil profile shall be qualified and shall be approved by the Planning and Zoning Department.

ARTICLE 5: REGULATIONS FOR AEROBIC DISPOSAL SYSTEMS

SECTION I. Compliance Standards

All individual mechanical aerobic wastewater treatment plants shall meet the standards prescribed in Standard No. 40, Section 5 of NSF (National Sanitation Foundation).

SECTION II. Permit Required

It shall be unlawful for any person to erect, construct, or perform any structurally significant alteration, remove, convert, or demolish any aerobic disposal system regulated by this Code without notifying, in writing, or, if required, obtaining a permit from the administering agency.

SECTION III. Application Procedure

The person applying for the permit shall first file an application in writing on a form furnished for that purpose by the Director of the Planning and Zoning Department. The application shall:

A. Identify and describe the activity for which permission is requested (e.g., construction, repair, etc.).

B. Identify the location of the activity for which permission is requested by legal description and street address.

C. Be signed by the owner of the premises where the activity is to be conducted, or his or her duly authorized representative. The representative may be required to submit evidence of such authority.

SECTION IV. Permit Qualifications

A permit authorized under this Article shall be issued subject to the qualifications specified in this Section.

A. Land Use

Permits may be issued under this Article only for single-family residences or duplexes, where each unit is occupied as a residence and where each unit shall be served by a separate system.

B. Minimum Lot Size

Unless a waiver or rule exception is granted pursuant to Article 1 of this Chapter, a minimum lot or tract size of 2.5 acres per living unit shall be required for any permit issued under this Article.

C. Standards

No permit shall be issued to any person, property, or establishment, which does not comply with and satisfy the standards specified in this Article and all applicable terms, conditions, and requirements of this Code.

SECTION V. General Requirements and Standards

All individual wastewater treatment plants requiring mechanical assistance to achieve aerobic conditions or pressurized delivery to the soil absorption site shall be maintained by a contracted manufacturer's representative. Copies of current maintenance contracts are to be forwarded to the Planning and Zoning Department and kept on file. Effluent from individual wastewater treatment plants shall receive additional treatment through the use of a subsurface absorption system, which complies with the standards and specifications, provided for septic tank systems under Section VI of Article 4 of this chapter. No plant shall discharge any effluent into or onto surface waters, ground water, air, or surface grade.

ARTICLE 6: REGULATIONS FOR MOUND SYSTEMS

SECTION I. Permits

It shall be unlawful for any person to erect, construct, or perform any structurally significant alteration, remove, cover, or demolish any mound disposal system without notifying in writing or, as required, obtaining a permit from the Planning and Zoning Department.

SECTION II. Permit Qualifications

A permit authorized under this Article shall be issued, and any mound system operated under the provisions of this Code, shall be approved subject to the qualifications specified in this Section.

A. Land Use

A mound system may be permitted or operated only for single-family residences or duplexes, where each unit is occupied as a residence and where each unit shall be served by a separate system.

B. Minimum Lot Size

Unless a waiver or rule exception is granted pursuant to Article 1 of this Chapter, a minimum lot or tract size of 2.5 acres per living unit shall be required for use, operation or permittance of any mound system under this Article.

C. Standards

Any mound system permitted or operated under authority of this Article shall comply with the standards prescribed in this Article and all applicable terms, conditions and requirements of this Code.

SECTION III. General Requirements and Standards

Mound systems shall be permitted only after a thorough site evaluation has been made, and landscaping, dwelling placement, effect on surface drainage and general topography have been considered. Mound systems shall not be utilized on soils where the high groundwater level or bedrock occurs within 12 inches of natural grade.

SECTION IV. Design

All mound systems shall be designed by a Registered Professional Engineer, and approved by the Planning and Zoning Department prior to receipt of a building permit. The designer is responsible to ensure that his/her design mitigates the limiting factor(s) noted by the administrative requirements or the soils information contained in the Soil Survey of Leavenworth County, Kansas. The designer will submit an "as built" drawing of the mound (or other non-standard) system to the Planning and Zoning Department. This drawing will attest the on-site system meets his/her design standards and installation criteria. The drawing will bear the professional engineer's seal and signature.

ARTICLE 7: REGULATIONS FOR SANITARY PRIVY

SECTION I. Permit

No sanitary privy shall be constructed or erected on any premises.

ARTICLE 8: REGULATIONS FOR HOLDING TANKS

SECTION I. Scope

For purposes of this Article, the term "Holding Tank" refers to a watertight receptacle to retain sewage on-site prior to removal from the site by a Sanitary Disposal Contractor licensed under Article II of this Chapter.

SECTION II. Authorized Usage

A holding tank may only be used for the temporary, on-site, retention of sewage before the contents are removed by a Sanitary Disposal Contractor.

A. Residential Properties
Not authorized for residences.

B. Commercial and Industrial Properties

A holding tank shall be the only type of system authorized under this Chapter which may be used to retain any commercial and/or industrial wastewater, and which may include domestic sewage, generated by a commercial or industrial establishment, and such holding tank system shall comply with all provisions of this Article but shall be administered and regulated as provided under Article 2 of this Chapter. Any underground holding tank retaining such wastes must also meet all requirements and regulations adopted by the Kansas Department of Health and Environment.

SECTION III. Permit Required

It shall be unlawful for any person, firm or corporation to construct, perform any structurally significant alteration, convert or use any holding tank without first obtaining a permit from the Planning and Zoning Department. Prior to issuance of a permit, the owner of the holding tank shall provide a copy of his service contract with a Sanitary Disposal Contractor licensed pursuant to Article 11 of this Chapter.

SECTION IV. Permit Qualifications

Any permit authorized under this Article shall be issued subject to the qualifications specified in this Section.

A. Term and Renewal

Permits for holding tanks used for commercial or industrial wastes are valid for twelve (12) months from the date of issuance and are renewable annually. Applications for renewals shall be submitted no later than thirty (30) days prior to permit expiration with the applicable fee. Upon receipt of the application and fee, a permit will be issued for the following year.

B. Minimum Lot Size

Unless a waiver or rule exception is granted pursuant to Article 1 of this Chapter, a minimum lot or tract size of 2.5 acres per occupied unit shall be required for the use, operation, or permittance of any holding tank for any property usage under this Article.

C. Standards

No permit shall be issued to any person, property, or establishment that does not comply with and satisfy the standards prescribed in this Article and all applicable terms, conditions, and requirements of this Code.

D. Transfer

Permits are not transferable.

SECTION V. General Requirements

The system shall be designed to consist of a building connection and tank. The design of the system shall ensure that waste discharged to the system:

A. Does not contaminate any groundwater or drinking water.

B. Is not accessible to insects, rodents or other possible carriers of disease.

C. Does not contaminate the waters of any bathing beach or streams used as a water supply or for recreational purposes.

D. Is not a danger by being exposed or accessible to animals or humans.

E. Does not give rise to a nuisance due to odor or unsightly appearance.

SECTION VI. Standards and Specifications

Any holding tank system authorized under this Article shall be designed, constructed and operated to comply with standards and specifications deemed necessary and advisable by the Director of the Planning and Zoning Department, or his designee, including the minimum requirements specified in this section.

A. Capacity Requirements

Tanks serving commercial, retail, or industrial establishments shall have minimum 5-day holding capacity, but not less than 2,000 gallons.

B. Site Location

Tanks shall be located at least 10 feet from any part of a building. Holding tanks shall be so located to an all-weather access road or drive so that the pumper may drive pumping equipment to within 10 feet of the servicing manhole.

C. Warning Device

A high water warning device shall be installed so that it activates 1 foot below the inlet pipe. This device shall be either an audible or illuminated alarm.

D. Access Opening

Each tank shall have an access manhole extended to finished grade, and shall consist of a circular cast iron ring and lid or other material which meets with the approval of the Planning Department. Any opening larger than 8 inches that extends to the surface shall be child and tamper resistant.

SECTION VII. Changes in Use

The permit holder shall notify the administering agency in writing within five (5) working days of any change in the use of the premises, which are serviced by the holding tank, or any change in ownership or occupancy of the premise.

ARTICLE 9: REGULATIONS FOR OTHER SYSTEMS

SECTION I. Approval

Other systems such as the At-Grade, Low Pressure Pipe, Evapotranspiration Bed, or similar systems, may be approved by the Planning and Zoning Department upon submission of plans and specifications.

SECTION II. Permit Required

A permit shall be required for any alternative system authorized or approved under this Article.

SECTION III. Permit Qualifications

Any permit or approval authorized under this Article shall be issued subject to the qualifications specified in this Section.

A. Land Use

Permits may be issued under this Article only for single-family residences or duplexes, where each unit is occupied as a residence and where each unit shall be served by a separate system.

B. Minimum Lot Size

Unless a waiver or rule exception is granted pursuant to Article 1 of this Chapter, a minimum lot or tract size of 2.5 acres per living unit shall be required for any permit issued under this Article.

C. Standards

No permit shall be issued to any person, property or establishment which does not comply with and satisfy standards prescribed for the alternative system by the Director of the Planning and Zoning Department, or his designee, consistent with standards imposed for the systems designated in this Chapter, and all applicable terms, conditions and requirements of this Code.

SECTION IV. Waste Stabilization Ponds

The use of individual waste stabilization ponds, usually referred to as lagoons, will be considered only if the installation of a septic-tank-lateral field disposal system is not practical, and the tract is five (5) acres or more in size with a minimum of 300 feet of road frontage. No further subdivision will be allowed on such tracts, until a public sewer is constructed, and all dwellings are connected to a sanitary sewer. Waste Stabilization ponds shall meet the minimum standards set forth by the Sanitarian's Environmental Handbook. A Waste Stabilization pond must be placed 100' from the property line at a 5 foot working depth. The separation may be waivered to 50' when the adjoining property owner signs a Waiver of Property Line Separation form provided by the Planning and Zoning Department. Directing non-domestic (industrial/commercial) wastes into a Waste Stabilization Pond is prohibited.

ARTICLE 10: REGULATIONS FOR INSTALLER

SECTION I. License Required

No person shall install, engage in the installation of, or repair a private sewage disposal system unless that person holds a valid Installer License issued by the Planning and Zoning Department. Employees of a validly licensed installer are not required to be separately licensed. Persons licensed under this code as an installer may, without separate license, design conventional and shallow in-ground systems that are pumped or gravity fed.

SECTION II. License Term and Renewal

Any license issued under this Article shall expire on December 31 of each year and must be renewed annually, on or before January 15 of any following year. Applications for licenses and renewal shall be filed on forms supplied by the Planning and Zoning Department. All required license fees shall be paid at the time of application for the license or renewal, and no fee required under this Code shall be prorated or refunded for any partial term or part-year application.

SECTION III. Standard of Performance

Prior to the issuance or renewal of a license under this Article, the applicant shall be required to demonstrate adequate knowledge of the regulations pertaining to private sewage disposal systems and general engineering principles pertaining to such systems. The administering authority may consider actual experience, education, or professional licensing of the applicant in the granting or denial of an application for an initial license or renewal, including prior revocations or disciplinary action.

Attendance by any applicant at an appropriate training workshop, conducted or sponsored by the Planning and Zoning Department or other recognized governmental, educational or professional institution, and satisfactory completion of a written examination administered by the Planning and Zoning Department covering subjects related to public health concerns, sewage disposal techniques, standards for design or construction or installation of sewage disposal systems, sewage treatment theory, and/or hydraulics, shall satisfy the requirements of this

Section. Any applicant who fails to satisfactorily complete the written examination may retake the examination after thirty (30) days.

SECTION IV. Continuation Training

Every person licensed, as an Installer under the authority of this Article must obtain a minimum of three (3) hours of approved continuation training each calendar year, and no license issued under this Article will be renewed without submission of a certification of the training to the Director of the Planning and Zoning Department. The training, to be approved, must be directly related to the knowledge requirements necessary for issuance of the license under Section III. Attendance at any workshop conducted, sponsored, or approved by the Planning and Zoning Department or any applicable professional association shall satisfy the requirements of this Section.

SECTION V. Installation Bonds

The administering agency may establish a requirement for bonding of any installer licensed under this Article and may prescribe reasonable terms and conditions for those bonds.

SECTION VI. Certificate of Insurance

A licensed installer shall have and maintain insurance for liability and workmanship in amounts and forms as designated by the administering agency, and a copy of the certificate of insurance shall be filed with the agency.

SECTION VII. Code Compliance

The installation, relocation, or repair of any private sewage disposal system shall be in compliance with the provisions of this Code.

SECTION VIII. License Revocation

A license may be revoked for failure to comply with this Code. The revocation procedure shall comply with the provisions of Chapter 1 of this Code.

SECTION IX. One Time Installer

A property owner requesting to install or repair their own residence's septic system may do so after attendance of a course of instruction by the Planning and Zoning Department and passing an examination and paying a set fee. Certificate of insurance will not be required for a one-time installer.

ARTICLE 11: REGULATIONS FOR SANITARY DISPOSAL CONTRACTORS

SECTION I. License Required

No person may engage in the pumping cleaning of a private sewage disposal system or transport sewage to a disposal site unless that person holds a valid Sanitary Disposal Contractor's License. Employees of a validly licensed Sanitary Disposal

Contractor are not required to be separately licensed. The license shall also designate the vehicles to be used by the licensee.

SECTION II. License Term and Renewal

Any license issued under this Article shall expire on December 31 of each year and must be renewed annually, on or before January 15 of the following year. Applications for licenses and renewals shall be filed on forms supplied by the Planning and Zoning Department. All required license fees shall be paid at the time of application for the license or renewal, and no fee required under this Code shall be prorated or refunded for any partial term or part-year application.

SECTION III. Standard of Performance

Every person licensed as a sanitary disposal contractor under this Article shall comply with the performance requirements specified in this Section.

A. Cleaning

A license holder, when cleaning a septic tank, shall remove the liquid, sludge and scum, leaving no more than three (3) inches depth of sewage.

B. Equipment

A license holder shall maintain his equipment so as to ensure that no spillage of sewage will occur during transportation, and that his employees are not subjected to undue health hazards. All sewage shall be transported in an enclosed tank.

C. Vehicles

Sewage shall be transported only in vehicles approved for that purpose by the Planning and Zoning Department. Each such vehicle must be inspected prior to issuance or renewal of a license to a Sanitary Disposal Contractor. The vehicle must be kept in good working condition and both the name of the licensee and the Sanitary Disposal Contractor license number shall be clearly displayed on both sides of the vehicle in bold letters not less than five inches high.

D. Disposal and Reporting

Sanitary disposal contractors may be required to certify that all sewage and household or industrial wastewater is being disposed of in a municipal wastewater treatment facility. No surface or subsurface disposal of septage shall be permitted in the County. The handler maybe required to submit to the Director of Planning and Zoning Department a report stating dates, sources, volume, and disposal site of each load or partial load of sewage or waste transported. The report must be verified by the person operating the disposal site for each load or partial load received from the contractor.

E. Experience

Prior to the issuance or renewal of a license the applicant shall be required to demonstrate adequate knowledge of the regulations pertaining to Sanitary Disposal Contractors. The administering authority may consider prior conduct of the applicant in localities not subject to this Code in the granting or renewal of a license as well as any prior violations of this Code.

F. License Holder

The license holder shall comply with any applicable federal, state, and local regulations or laws including, but not limited to, those set forth now or hereafter adopted in Standards for the Use or Disposal of Sewage Sludge, volume 58, number 32, page 9388, of the Federal Register, February 19, 1993, as amended.

G. Insurance

The license holder shall maintain general liability insurance in the amount of $1,000,000.00 and provide proof to the Planning and Zoning Department as part of the application process.

SECTION IV. License Revocation

A license may be revoked for failure to comply with this Code. The revocation procedure shall comply with the provisions of Chapter 1 of this Code.

ARTICLE 12: REGULATIONS FOR DESIGNER

SECTION I. License Required

No person shall conduct or perform the services of designer for any non-standard sewage disposal system regulated under the Chapter or for other purposes of this Code, unless that person holds a valid license issued by the Planning and Zoning Department. Employees of a validly licensed Designer are not required to be separately licensed. A licensed professional engineer shall be deemed licensed for the purposes of this Section. A person licensed as an installer under this Code shall be deemed licensed under this section for the purpose of designing conventional and shallow in ground systems that are pumped or gravity fed, as determined by the administering agency, but no others, and a license shall be required for the design of any alternative system such as mound, low pressure pipe, or other permitted alternative systems.

SECTION II. License Term and Renewal

Any license issued under this Article shall be valid for a term of two (2) years, running concurrently with the calendar year, and shall expire on December 31 of each succeeding calendar year. Any license issued under this Article may be renewed, on or before January 15 of any succeeding year. Applications for licenses and renewals shall be filed on forms supplied by the Leavenworth County Planning Department. All required license fees shall be paid at the time of application for the

license or renewal, and no fee required under this Code shall be prorated or refunded for any partial term or part-years application.

SECTION III. Standard of Performance

Prior to the issuance or renewal of a license under this Article, the applicant shall be required to demonstrate adequate knowledge consistent with the provisions of Section III of Article 10 of this Chapter.

SECTION IV. Continuation Training

Every person licensed, as a Designer under the authority of this Article must obtain a minimum of three (3) hours of approved continuation training each calendar year, and no license issued under this Article will be renewed without submission of a certification of the training to the Director of the Planning and Zoning Department. Any training shall be consistent with the provisions of Section IV of Article 10 of this Chapter.

SECTION V. License Revocation

A license issued under this Article may be revoked for any failure to comply with this Code. The revocation procedure shall comply with the provisions of Chapter 1 of this Code.

CHAPTER 3

PUBLIC AND/OR COMMUNITY SEWERAGE SYSTEMS

ARTICLE 1: PURPOSE

SECTION I. General Statement

The population of Leavenworth County has reached such a density, combined with the proliferation of subdivisions, that many once rural areas now approximate urban environments. In order to provide for the health and safety of the public, both existing and future, subdivision resulting in near urban living conditions must be provided with urban utilities and services.

SECTION II. Growth Management Areas and Map

Growth Management Areas were defined as part of the Leavenworth County Comprehensive Plan and are utilized in this Sanitary Code to determine sewerage requirements for various areas of the County.

SECTION III. Public Sewerage Installation

All subdivision plats with lots less than 2 and 1/2 acres must consider public sewerage. Gravity sewers are considered the standard. Alternative systems will be reviewed in accordance with Kansas Department of Health and Environment Policy Memorandum 87-6 (See Appendix I). Standard specifications for sewer line construction in Leavenworth County, Kansas, shall be completed in accordance with standards contained in the current document entitled, Standard Specifications for Sewer Line Construction.

SECTION IV. Damage to Public Sewerage System

A. It shall be unlawful for any person to deposit, by any means whatsoever, into any plumbing fixture, floor drain, interceptor, sump, receptacle or device which is connected to any drainage system, or public sewer system; ashes; cinders; solids; rags; flammables, poisonous, or explosive liquids; gasses; ores; greases; and anything which could cause damage to the public sewer.

B. No rain, surface or subsurface water shall be connected to or discharged into any drainage system unless approved by the administrative authority.

C. No cesspool, septic tank or seepage pit, or drain field shall be connected to any public sewer.

D. An approved watertight sewage or wastewater holding tank, the contents of which, due to their character, must be periodically removed and disposed of at some approved off-site location, shall be installed only when required by the local health officer or his administrative assistant. This is to prevent surface or subsurface contamination damage to the public sewer or other hazardous or nuisance condition.

ARTICLE 2: SUBDIVISIONS

SECTION I. General Statement

Due to the environmental changes, required utilities and services necessary for perpetuating healthful occupancy of subdivisions in the unincorporated area of Leavenworth County must be developed with a sanitary sewer system, unless a waiver is granted as provided for in the Leavenworth County Subdivision Regulations.

SECTION II. New Subdivisions

The requirement for a sewerage system is based on protecting the existing communities and to provide for the safe healthful longevity of the new subdivision. The developer shall submit, as part of the preliminary plat review process, a feasibility study made by a licensed engineer, of the best means of developing a sewer system for the proposed major subdivision. The feasibility study must include a statement or estimate of probable cost and whether the developer can expand the community's sewerage system and if the community is willing to allow the developer to do what is necessary to enlarge the community system to serve the proposed major subdivision.

A. When it appears that the most feasible and economic procedure is to expand the community's sewerage system, the developer must work with the community at its convenience to obtain the expansion.

B. In cases where the feasibility study indicates that the best and most economical procedure is to develop a separate sewerage system for the major subdivision, the only near-by community coordination required is that covered in the subdivision code regulation regarding 660-foot distance limitations. The separate sewerage system planned and developed for the proposed major subdivision must be designed in accordance with and approved by the Kansas Department of Health and Environment, and to the satisfaction of Leavenworth County. The construction of the state approved sewerage system shall be performed by a licensed contractor and supervised by the County Engineer.

SECTION III. Responsibility for Operation

The responsibility for operation of sewerage systems not connected to existing public/community system must be vested in a sewer district, improvement district, or similar public agency authorized to operate public wastewater systems in the State of Kansas.

SECTION IV. Existing Subdivisions

Failure of three (3) private on-site sewage management systems or ten (10) percent of the private on-site systems, whichever is lesser, within a subdivision, where the cause of the failure is due to soil conditions, geology, or hydrology, shall cause the subdivision to be declared a potential health hazard in accordance with KSA65-159, and reported to the Kansas Department of Health and Environment.

All subdivision property owners will be notified of the conditions and potential health hazard by the County Health Officer or Joint Board of Health or the Secretary of Health and Environment. And given sixty (60) days to form a sewer benefit district. As soon as the benefit district has been formed, the board of County Commissioners will have an engineering feasibility study made to determine the best and most economical means of correcting the sanitary problems. The study should be completed and the findings and possible solution and alternatives presented to the Board of County Commissioners within 120 days. At this point, one-half year has passed since the problem became a matter of public record. A decision as to what means or methods of correcting the problem should be made within an additional sixty (60) days. Allowing another four (4) months or 120 days to develop plans and complete necessary coordination; work should at least be started on correcting the problem and returning the subdivision to a safe, healthful neighborhood. If a one-year time schedule can not be met due to unusual or extreme conditions, special action on a case by case basis will be required, with the coordination and overview of the Kansas Department of Health and Environment as required by KAR 28-5-6.

CHAPTER 4

SOLID WASTE DISPOSAL

ARTICLE 1: PURPOSE

SECTION I. General Statement

The provisions of this chapter of the Sanitary Code have been adopted for the purpose of regulating and providing for the safe and sanitary storage, collection, transportation, processing and disposal of solid waste. This Code shall apply to all unincorporated areas of the County and those incorporated areas within the County that adopt this Sanitary Code.

SECTION II. Definitions.

The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

A. Solid Waste: means garbage, refuse and other discarded materials including, but not limited to, solid, semi-solid, sludge liquid, and contained gaseous waste materials resulting from industrial, commercial, agricultural, and domestic activities.

B. Garbage shall include wastes from the preparation, cooking and consumption of foods and foodstuffs, and market refuse and waste from the handling, preparation, storage and sale of foods and foodstuffs.

C. Trash shall include:

1. Combustible Trash, which shall include papers, cartons, boxes, barrels, wood and excelsior, tree branches, yard trimmings, wood furniture, bedding.

2. Noncombustible Trash, which shall include the following:
   a. Metals, tin cans, metal furniture, broken glass, crockery, bottles, jars, small quantities of rock and pieces of concrete and other mineral refuse and bones
   b. Manure and decayed animal and vegetable matter;
   c. Loose earth and sand, gravel, and ashes;
   d. Dead animals

D. Trash shall not include: Earth and wastes from building operations, solid wastes resulting from industrial processes and manufacturing operations, such as: food-processing wastes, boiler house cinders, lumber, scraps and shavings or any item that is considered a special waste or a listed waste by the Kansas Department of Health and Environment.

ARTICLE 2: STANDARDS FOR SOLID WASTE TEMPORARY STORAGE AT POINT OF ORIGIN

SECTION I. General

A. The owner and/or occupant of any dwelling, business establishment or industrial plant shall provide temporary sanitary storage for all solid waste produced on his property which meets standards set forth in this code. All solid waste shall be stored so that:

1. It does not attract rats, flies, mosquitoes, or other vectors
2. It does not provide shelter or a breeding place for vectors
3. It does not create a health or safety hazard
4. It is not unsightly
5. The production of offensive odors is minimized

B. Each premise shall be provided with a sufficient number of acceptable containers to accommodate all solid waste materials.

SECTION II. Solid Waste Storage Containers

A. Solid waste from residential, commercial and industrial establishments shall be stored in approved solid waste containers.

B. On commercial and industrial premises, where the quantity of waste generated is large and where the use of individual storage containers is impractical, bulk containers may be used for on-premises storage of waste. The bulk container may be equipped with compaction equipment and shall be of such size, design and capacity as to be compatible with the collection equipment. Bulk containers shall be constructed of durable metal or plastic material; be easily cleaned; and be equipped with tight-fitting self-closing lids or doors, both of which can be easily opened from the inside for child safety.

ARTICLE 3: SPECIFIC STORAGE STANDARDS FOR GARBAGE, PUTRESCIBLE WASTE, HAZARDOUS WASTES AND NON-PUTRESCIBLE WASTE

SECTION I. Garbage and Putrescible Waste

A. Garbage and putrescible wastes shall be stored in any of the following:
1. Rigid durable containers, non-absorbent, water tight and rodent proof, with close fitting lids.
2. Rigid containers equipped with disposable liners (bags) of reinforced kraft paper or polyethylene or similar material designed for storage or garbage.
3. Other types of containers meeting the above general requirements and acceptable to the collection agency.

SECTION II. Hazardous Wastes

A. Hazardous wastes shall be stored in compliance with the Kansas Department of Health and Environment requirements and in a manner, which will prevent spillage, leakage of liquid, and/or the concentration or generation of harmful or explosive vapors or offensive odors from the stored materials. Containers for hazardous wastes shall be of durable, corrosion resistant, watertight fitting lids and covers. Containers shall be properly labeled, and kept in a safe location, protected form tampering by unauthorized persons.

B. Other types of containers may be used when written approval of the Kansas Department of Health and Environment has been obtained for use of a container at a specific location for a specific purpose. All piping, valves and other appurtenances associated with the storage and transfer of hazardous wastes shall be constructed of corrosion resistant materials and maintained in a leak-proof condition.

SECTION III. Non-putrescible Bulky Wastes

These wastes shall be stored for collection in a manner that does not create a health hazard, fire hazard, rodent harborage, or permit any unsightly condition to develop.

ARTICLE 4: COLLECTION REQUIREMENTS

SECTION I. General

All solid waste shall be removed from the premise on which it was generated at least once each week to prevent nuisance or health hazards from occurring.

SECTION II. Residential Solid Waste Collection

In the unincorporated areas of the County, the individual resident shall be responsible for the handling and disposal of their own solid waste. Each resident shall have the option of transporting their solid waste to an approved transfer station, landfill, or incinerator and be responsible for gate fees, or of employing a licensed private solid waste collector of their choice.

SECTION III. Commercial and Industrial Solid Waste Collection

The owner and/or occupant of each commercial or industrial establishment in the County are responsible for the collection of all solid waste generated upon such premises. Each commercial or industrial establishment shall have the option of transporting its own solid waste to the approved transfer station, landfill, or incinerator, or employing a licensed private soiled waste collector its choice. Garbage and putrescible materials shall be removed from commercial and industrial properties at least once each week to prevent unhealthy or nuisance conditions. Non-putrescible materials shall be removed from commercial and industrial establishments as often as necessary to prevent overfilling of storage facilities or creation of fire hazards.

SECTION IV. Hazardous Wastes

Hazardous waste shall be removed from commercial and industrial premises as often as necessary to prevent explosions or fire hazards. Whenever hazardous wastes, in any quantity which could be reasonably expected to be hazardous to public health or the environment, are to be transported off the premises to a licensed disposal site, the producer of such wastes shall comply with all KDHE regulations for hazardous waste, render them harmless, and shall issue a hazardous waste manifest to accompany each shipment of wastes, shall provide such information as is necessary to insure safe handling, and the producer shall make prior arrangement with the management of the licensed disposal site, processing facility to prevent the operation of the disposal area to be altered as is necessary for safe handling. Every producer of hazardous wastes shall provide labels for all containers

ARTICLE 5: COLLECTION EQUIPMENT

SECTION I. Vehicles and Equipment

All vehicles and equipment used for collection and transportation of solid waste and recycling materials shall be designed, constructed, maintained and operated in a manner that will prevent the escape of any solid, semi-solid, or liquid wastes from the vehicle or container onto the ground, street, or highway. No solid waste shall be transported in the loading hoppers of compaction type bodies.

All vehicles used for the collection and transportation of solid waste in Leavenworth County shall be maintained in a safe, clean and sanitary condition.

Prior to approving any application for a collection permit, the Solid Waste Department shall inspect all equipment used in the collection of solid waste for cleanliness and function ability.

SECTION II. Permits

No person shall engage in the business of collecting, transporting, processing, or disposing of solid waste within Leavenworth County without first obtaining a permit. The term of all permits to be issued hereunder shall be for a period of one year commending on August 1 and expiring on July 31 of the new year.

SECTION III. Collection and Transportation Vehicle Permits

Any person desiring to collect, transport, and dispose of solid waste in Leavenworth County shall obtain an annual permit from the Solid Waste Division for each vehicle to be used for said collection, transportation and disposal of solid waste. Provided that this requirement shall not be construed to apply to persons, firms, or corporations engaged in the occupations of tree trimmers or surgeons, or to persons transporting their own solid waste to a processing or disposal site. However, such persons who are not required to obtain a permit, hereunder shall comply with all other regulations of the County or appropriate municipality pertaining to the transportation and disposal of solid waste.

SECTION IV. Permitting

A. All commercial vehicles transporting solid waste in Leavenworth County shall be registered by permit.

B. Application for a permit shall be made to the Leavenworth County Solid Waste Division and shall set forth:

1. The name of the applicant.
2. The address of the applicant.
3. The title number, make and type of the vehicle to be operated for the transportation of solid waste to the Leavenworth County Solid Waste Transfer Station.
4. Shall be accompanied by a certificate of insurance for the vehicle to be permitted.

C. Prior to the issuance of any permit, the Leavenworth County Solid Waste division shall inspect each vehicle to be permitted.

D. All vehicles and equipment used for the collection and transportation of solid waste in Leavenworth County shall be designed, constructed, maintained, and operation in a manner that will prevent the escape of any solid, semi-solid, liquid, or gaseous waste from the vehicle or container.

E. All vehicles permitted shall be maintained in a sanitary condition.

F. Permits shall be issued for a period of one year, commencing on the second Tuesday of August and expiring on the Second Monday of August of the following year.

F. The permit fee for the one year period shall be set by the Board of County Commissioners, with a prorated fee based on the number of months remaining in the permit year charged to applicants applying for a permit subsequent to the second Tuesday of any August following the adoption of this Code.

G. No permit issued hereunder shall be assigned or transferred.

H. All vehicles operating under the permit required by this code shall display the County permit number on lower right corner of windshield.
   1. Permit number displays shall be provided by the Leavenworth County Solid Waste Division.

SECTION V. New Applications and Refunds

A. New applications shall pay a prorated fee based on the number of months remaining in the permit year and the above fee schedule. Once a fee has been paid, no refunds shall be made.

SECTION VI. Transferring of Permit

A. No permit issued hereunder shall be assigned or transferred by persons holding the same as permit holder.

B. Such permit holder may, however, change the registration of the vehicle operated under his permit upon the following condition:

1. The registration of the vehicle theretofore operated under such permit shall be surrendered.
2. The sum of $100.00 shall be paid by the permit holder to the administrative agency as a fee for the transfer of registration of such vehicle.
3. If the vehicle to be registered is of greater gross weight than the vehicle originally registered, the permit holder shall pay an additional sum equal to the difference between the original and new fees.

SECTION VII. Vehicle Permit Numbers

All motor vehicles operating under the permit required by this Sanitary Code should display the County permit number so issued.

SECTION VIII. Revocation of Permit; Appeal

A. Notwithstanding any other provision contained in this Code, the Leavenworth County Solid Waste Division may, upon just cause, refuse to accept any waste transported, to the Solid Waste Transfer Station that would be detrimental to the operation of this station.

B. In the event any permit holder fails to comply with the provisions of this chapter, the Director of the Leavenworth County Solid Waste Division may, upon having provided written notice of violation to the permit holder, revoke any permit issued.

1. Any permit holder whose permit is so revoked shall not be eligible for reinstatement for a period of one year from the revocation.

C. Any permit holder wishing to appeal the decision of the Director of the Leavenworth County Solid Waste Division to revoke a permit may do so by providing to the Board of County Commissioners of Leavenworth County, Kansas, within ten (10) working days of the receipt of the notice of revocation of permit, in writing, a request that the Board of County Commissioners conduct a hearing to determine whether the revocation of the permit was justified. The Board of County Commissioners shall, upon receipt of the written notice of appeal, conduct a hearing on the appeal within ten (10) working days, providing notice both to the permit holder and Director of the Leavenworth County Solid Waste Division of the time and place of the hearing.

1. At the hearing the Board shall rule and determine whether the permit in question shall be revoked.

ARTICLE 6: SOLID WASTE PROCESSING AND DISPOSAL

SECTION I. General

Solid waste shall be disposed of at a processing facility or disposal site approved by the administrative agency and complying with all requirements of the Kansas Department of Health and Environment and any applicable county or municipality requirements. No person shall dispose of any solid waste by depositing or dumping the same in or upon any street, alley, road, highway, park, or public grounds or along the banks, or in any river, stream, drainage canal, drainage ditch, creek, or natural water course, or any other place within Leavenworth County, except at approved processing facility or disposal site. Provided, however, that upon private rural property rubbish may be utilized for control of soil erosion if such does not constitute a public health hazard or nuisance.

SECTION II. Transfer Stations

Solid waste may be separated and consolidated at transfer stations that are approved by the Kansas Department of Health and Environment and meet any other applicable regulations of the County.

SECTION III. Incinerators

Combustible solid waste may be burned in incinerators that are approved by the Kansas Department of Health and Environment and meet any other applicable requirements of the County.

SECTION IV. Solid Waste Disposal Facilities

A. All non-hazardous solid wastes and residue from solid waste processing operations shall be disposed of in permitted municipal solid waste landfills located on sites approved by the Kansas Department of Health and Environment, and meeting any other applicable County regulations.

B. No sanitary landfill may be established or operated in Leavenworth County unless that landfill has been designed, constructed and a permit issued by the Kansas Department of Health and Environment and all other applicable County regulations have been met.

C. No materials of a hazardous nature, including but not limited to sewage solids, oil sludge, dry concentrates, waste chemicals, pathological and biological wastes, radioactive materials, or explosives, shall be disposed of in a sanitary landfill until the locations, method of disposal and other site factors have been evaluated by County and the Kansas Department of Health and Environment and the specific arrangements for handling the materials have been approved.

SECTION V. Demolition Landfill

A. A private landfill may be established for disposal of specified construction and demolition non-hazardous solid waste from a designated project, and where the fill can contribute to erosion control.

B. To establish such a landfill, a permit must be issued by the Kansas Department of Health and Environment and all applicable County regulations must be met.

CHAPTER 5

WATER SUPPLY

ARTICLE 1: PURPOSE AND INTENT

The purpose of the provisions of this chapter is to protect public health and the environment through the regulation of environmental factors that affect water quality and availability.

SECTION I. Water Supply Required

Owners of private homes that are used as a principle residence and all rented or leased homes shall furnish at least one convenient outlet supplying an adequate quantity of potable water. Owners of permanent establishments shall furnish an adequate supply of safe water for the clientele.

SECTION II. Public Water Supplies

A. State Permit Required

No person shall operate a public water supply without obtaining a permit from the Kansas Department of Health and Environment.

B. State Approved Plans

No person shall construct any public water supply on any property subject to the provisions of this code until the plans and specifications have been submitted and approved by the Kansas Department of Health and Environment. A copy of the plans and specifications shall be made available to the Leavenworth County Health Department, if requested.

ARTICLE 2: AREA OF APPLICABILITY

SECTION I. Tract Size

Tracts of land with five (5) acres or more may obtain their domestic water from water well. Obtaining water from streams and impoundments is not recommended.

SECTION II. Residences and Subdivisions

Domestic water supply for tracts of land of less than five (5) acres must be furnished by a public water supply.

SECTION III. Public Water Supply System

The term "public water supply system" means a system for delivery to the public of piped water for human consumption, if this system has at least ten (10) service connections or regularly serves at least twenty-five (25) individuals daily at least

sixty (60) days out of the year. This term includes any source, treatment, and storage or distribution facilities used in connection with the system.

ARTICLE 3: COMMERCIAL OPERATIONS

SECTION I. General

Commercial operations requiring a potable water supply must follow the general guidelines for domestic supply. The preferred source is from an established public water supply. If the commercial operation is located on a tract of land of less than ten (10) acres, a treated, processed supply must be used. On tracts of more than ten (10) acres, a well meeting all requirements of State regulation may be used. Any required county permit application for business operation or zoning must be accompanied by verification of all state requirements for water supply, or meter receipt from a RWD, indicating that the facility can be supplied.

CHAPTER 6

SEPTAGE WASTE HAULERS

ARTICLE 1: PURPOSE

SECTION I. Purpose

The provisions of this chapter of the Sanitary Code have been adopted for the purpose of regulating and providing safe disposal of septic sludge and other solid wastes.

SECTION II. Sewage Removal Permit

No person, firm or corporation may remove, transport, or dispose of the contents or septic tanks, or on-site sewage management systems without having first obtained form the Planning and Zoning Department an annual sewage removal permit. The application for the permit shall be submitted in writing on forms provided by Planning and Zoning Department. The application shall include 1) the business name and address; 2) name and address of the applicant; 3) license tag number and identification number of vehicle; 4) the manner by which such contents are to be removed, transported, and given final disposal; and 5) written documentation that sewage removed and transported will be accepted at disposal sites.

SECTION III. Disposal Methods

Disposal of sewage from on-site sewage management systems shall be by discharge to a public or community sewerage system.

SECTION IV. Vehicle Identification

The name of the person or firm engaging in the removal of sewage from on-site sewage management systems shall be lettered on both sides of each vehicle used for sewage removal purposes. Letters and numerals shall not be less than two (2) inches in height.

SECTION V. Vehicle Maintenance

Every vehicle used for removal of sewage form on-site sewage management systems shall be equipped with a watertight tank or body. All pumps, hose lines, valves and fittings shall be maintained so as to prevent leakage. The operator shall demonstrate that the equipment is in good operating condition and will perform its function without leakage or spillage.

SECTION VI. Revocation of a Sanitary Services License

A permit may be revoked for failure to comply with these regulations.

DEPARTMENT OF HEALTH AND ENVIRONMENT

Policy Memorandum 87-6
April 1987

FROM: Gyula F Kovach, P.E.
Manager, Bureau of Water Protection

SUBJECT: CONSTRUCTION ALTERNATIVES TO CONVENTIONAL SANITARY SEWER SYSTEMS

PURPOSE:

To establish the Bureau of Water Protection's policy regarding approval of nonconventional alternatives to standard gravity sanitary sewage collection systems. This policy explains when the Bureau of Water Protection will consider nonconventional sanitary sewer collection systems, and what conditions must be satisfied before nonconventional sanitary sewer systems will be approved.

BACKGROUND:

Historically, sanitary sewage service in Kansas has been proved through construction of eight-inch minimum diameter gravity sewer lines with pump stations provided as necessary. Increased interest in alternative sewer collection systems is being expressed in Kansas as an alternative to the traditional eight-inch gravity line approach to sanitary sewage service. The Kansas Department of Health & Environment's Minimum Standards of Design for Water Pollution Control Facilities, adopted pursuant to K.S.A. 65-171h, address pressure sewer collection systems briefly in Chapter 6, Sanitary Sewer Design. The minimum standards state, "Pressure sewer collection systems may be utilized where adequate justification is given for their use. The entity with responsibility for maintaining the system must demonstrate it has the capability and manpower to operate and; maintain the system."

Conventional sanitary sewer design, due to its proven technology, simplicity, energy efficiency, and ease of operation and maintenance, is the accepted method of approach for providing sanitary sewage service to Kansas communities and new developments. However, the Department recognizes there are unusual circumstances that may require consideration of alternative technology such as septic tank effluent pump systems, pressure sewer systems, variable grade sewers, and use of grinder pumps as alternatives to conventional gravity sewer systems. The circumstances include industrial applications, end line usage, post sewer construction basement service, unusually deep basement service, low population density, poor soil conditions, high groundwater elevation, and rocky or hilly terrain. Initial cost savings realized with installation of alternative sewer systems must be compared with additional operation and replacement costs inherent

With the more sophisticated, maintenance-intensive alternative systems, and the capability of the owner to operate and maintain the system must also be demonstrated. Kansas Department of Health and Environment's review will encompass these areas and approval will not be provided unless the Department is assured the application of alternative technology is appropriate to the requested sewerage service.

POLICY

Bureau of Water Protection approval for alternative sewer systems will be considered only when the present worth cost difference of conventional sewers and nonconventional sewers is significant, and if the responsible entity can demonstrate it has the financial, legal and organizational capability and manpower to operate and maintain the system. The entire nonconventional system shall be publicly owned and operated with appropriate right-of-ways for maintenance, repair and replacement.

The present worth cost comparison must include capital cost provisions for spare pumps and parts, system failure detection, maintenance costs, standby equipment costs, right-of-way costs, and other costs as appropriate. For the purposes of this comparison, the design life of conventional sanitary sewer systems shall be considered 50 years, the design life of conventional pump stations shall be considered 20 years, while the design life of either grinder pumps or individual household pumping units shall not exceed 10 years. The sewage piping for the individual household units may also have a lifetime of 50 years.

Information provided by Kansas Department of Health and Environment to address the capability of the responsible entity to operate and maintain the system shall include provisions for routine and emergency maintenance; right of access for repairs and maintenance; an assessment of man-hour requirements and availability; an assessment of standby equipment needs; an assessment of emergency operation including power failure, component malfunctions and emergency operating procedures; and a proposed method of sewer charges to address these items. A statement by the responsible public entity requesting approval of the alternative technology must be submitted indicating I is committed to providing the increased attention to maintenance necessary to assure a continuously operating system and to maintaining a sufficient spare parts inventory. Further proof of public ownership for the entire nonconventional system shall also be submitted with all other technical and nontechnical information. The contractor shall be required to furnish a two-year cash performance bond to the owner for 100% of the system cost in the event of system failure. The owner must submit assurances a conventional system will be constructed within one year of system failure, and must provide Kansas Department of Health and Environment a performance certification at the end of the two-year period.

PUBLICATIONS REFERENCE LIST

KANSAS STATE RESEARCH & EXTENSION WATER QUALITY PUBLICATIONS

Groundwater and Well Contamination	MF932
Safe Domestic Wells	MF970
Septic Tank-Soil Absorption Systems	MF944
Soil Evaluation for Home Septic systems	MF945
Wastewater Lagoons for Private Homes	MF1044
Why Do Septic Systems Fail	MF946
K-State Bulletin	MF-2246

Kansas Association of Sanitarians Environmental Handbook

KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT PUBLICATIONS

Bulletin 4-1: A Manual of Recommended Standards for Locating Constructing, and Equipping Water Wells for Rural Homes

Bulletin 4-2: Minimum Standards for Design and Construction of On-Site Wastewater Systems

LEAVENWORTH COUNTY
PROFESSIONAL ENGINEER
ON-SITE WASTEWATER DISPOSAL SYSTEM WORKSHEET

This completed worksheet and accompanying system diagram is necessary for the issuance of a Building Permit in Leavenworth County.

System is site specific for:

NAME _____

ADDRESS/LEGAL DESCRIPTION _____

Soil Limiting Factor (s): (Slope, bedrock, groundwater, slow perc)___

How limiting factor(s) has (have) been mitigated: _____

Type of system to be installed: _____

System capacity in gallons: _____

Preliminary drawing is attached _____

Certification:

An as-built diagram will be submitted to the Leavenworth County Planning Department within five days (5) days of project completion. This diagram will be accompanied by a statement certifying that the system meets the designer's design criteria and installation standards.

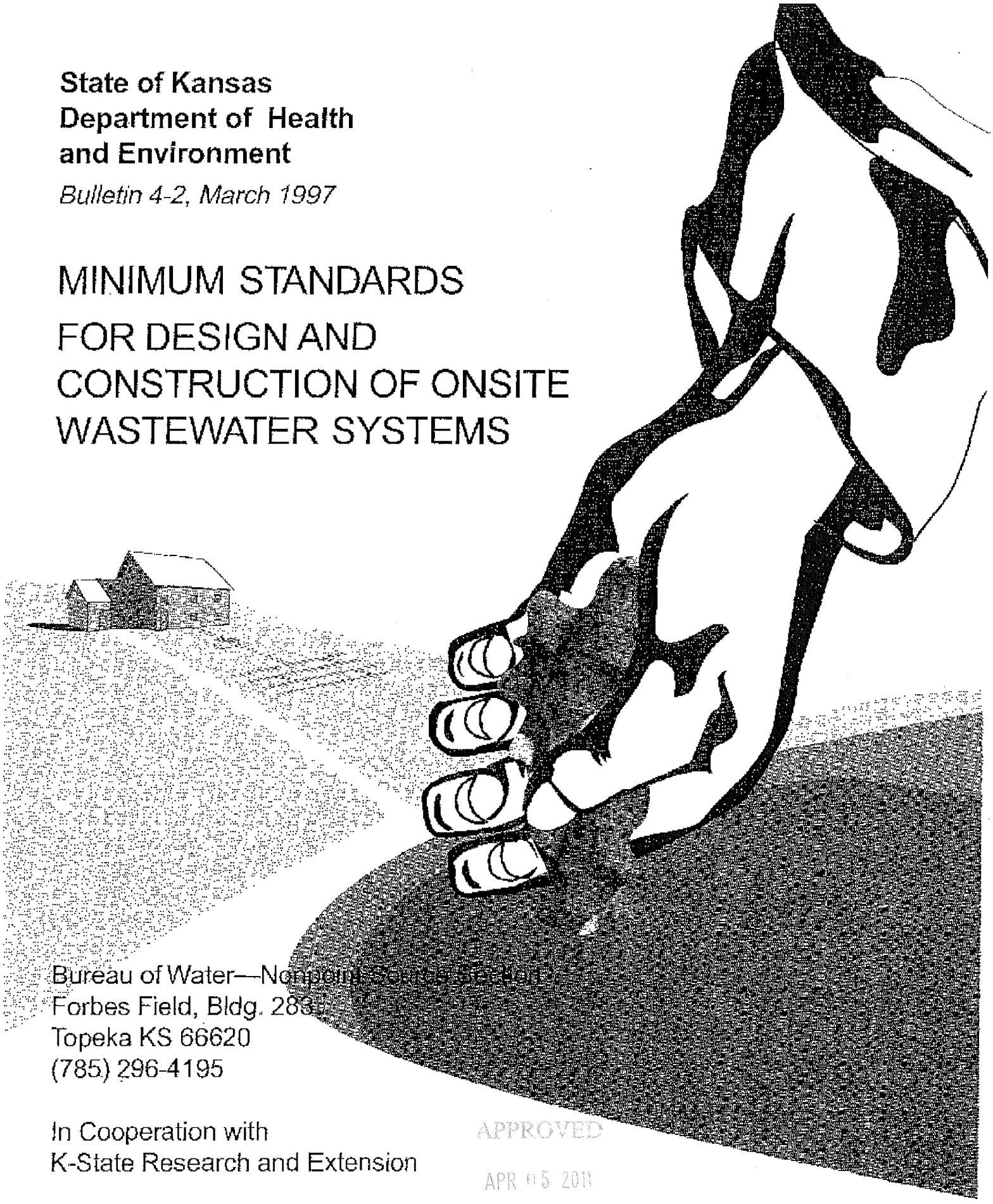
APPENDIX II

Bulletin 4-2

State of Kansas
Department of Health
and Environment

Bulletin 4-2, March 1997

MINIMUM STANDARDS FOR DESIGN AND CONSTRUCTION OF ONSITE WASTEWATER SYSTEMS



Bureau of Water—Nonpoint Source Section
Forbes Field, Bldg. 283
Topeka KS 66620
(785) 296-4195

In Cooperation with
K-State Research and Extension

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Introduction

Kansas Administrative Regulations (K A R 28-5-6 to 9) authorize the Kansas Department of Health and Environment (KDHE) to establish minimum standards for septic tank–lateral fields KDHE bulletin 4-2, *Minimum Standards for Design and Construction of Onsite Wastewater Systems* fulfills that purpose The minimum standards presented in this document are intended to ensure domestic wastewater is managed so that:

- Quality of surface and groundwater is protected for drinking water, recreation, aquatic life support, irrigation and industrial uses
- A breeding place or habitat will not be created for insects rodents and other vectors that may later contact food people pets, or drinking water
- Wastewater will not be exposed on the ground surface where it can be contacted by children and/or pets creating a significant health hazard
- State and federal laws and local regulations governing water pollution or wastewater disposal will be met
- Nuisance conditions or obnoxious odors and unsightliness will be avoided

Bulletin 4-2 is not intended to provide an in-depth discussion of the rationale for these standards For more information, see the *Environmental Health Handbook* and resources identified therein as well as other references in Appendix B (page 16) Most county health departments have a copy of this handbook, or copies are available at cost from Kansas State University Extension Biological and Agricultural Engineering (see Appendix B)

Local governments have the authority to adopt minimum requirements (codes) for onsite wastewater management systems, to approve individual plans, to issue permits for construction, to issue permits for operation, and to grant variances County sanitary (environmental) codes specify local design and permitting requirements. Compliance with these requirements helps prevent illness caused by environmental contamination and protects surface and groundwater

Some local requirements, such as those in wellhead protection or sensitive groundwater areas, may be more stringent than those established in Bulletin 4-2. Often, these stricter requirements provide greater protection of public health and the environment, especially where water resources are vulnerable to contamination.

Sanitary codes are adopted and administered by local government usually through county health departments The local administering authority should always be contacted before any time or money is invested in system design plans installation, or repairs

If there is no local code, landowners are required to comply with Kansas Administrative Regulations (K A R) 28 5 6 to 9 and minimum standards in this bulletin If no assistance is available from the health department or other local authority, contact your county Extension Office or KDHE Bureau of Water phone (785) 296 4195, or the nearest KDHE District Office (see inside back cover)

K A R. 28-5-6 stipulates that all domestic wastewater shall be discharged to an approved sewage collection system or an approved lagoon, septic system, or alternative system Domestic wastewater means all waterborne wastes produced at family dwellings in connection with ordinary living including kitchen toilet laundry shower and bath tub wastewater It also includes similar type wastewater produced at businesses, churches industrial, and commercial facilities or establishments

Wastewater from a home shall be discharged to a properly designed and maintained septic tank-soil absorption field or wastewater pond an approved alternative treatment and disposal system, or a permitted sewage treatment plant Seepage pits, cesspools and dry wells (rat holes) are not permitted. This bulletin provides information on conventional soil absorption fields wastewater ponds, and alternatives that may be considered when conventional absorption fields or ponds are not suitable

Bulletin 4-2 covers five basic elements of proper septic tank–lateral field system design:

1 wastewater flow,
2 soil and site evaluation,
3 septic tank standards, for design, construction and installation
4 lateral field design and construction, and
5 system maintenance

This bulletin also addresses basic principles for wastewater ponds.

This bulletin is intended to provide information on treatment of domestic wastewater. Domestic wastewater excludes surface runoff from roof paved areas or other surfaces; subsurface drainage from springs, foundation drains, and sump pump; or cooling water Industrial or commercial wastewater (from shops manufacturing car washes, etc) is not permitted to be discharged to an onsite soil absorption system, so it shall not be mixed with domestic wastewater

By following the standards established in Bulletin 4-2 and your county s sanitary code you actively contribute to protecting the environment and quality of life for your family, your neighbors, your community, and other Kansans Your contribution is appreciated!

Wastewater Flows

One major concern in the design of household wastewater systems is the quantity of wastewater generated daily. The system must have enough capacity to accommodate and treat this total flow. Normal contributions to this flow will come from bathroom, kitchen, and laundry facilities. Kansas regulations require that all domestic wastewater be treated and disposed through the onsite system. Surface runoff from roofs and paved areas, subsurface drainage from footing drains and sump pumps and cooling water are not domestic wastewater and must be excluded from soil absorption systems. Such water may be used to help maintain the operating water level in wastewater ponds.

Design flow is estimated by multiplying the number of household bedrooms by 150 gallons per day (gpd). This is based on 75 gallons per person per day for two people in each bedroom[1]. This accounts for the number of people that can occupy the home for extended periods rather than how many actually live there when the system is installed. Houses frequently experience a change in ownership or occupancy over the life of the wastewater system. When calculating wastewater flow note that a water softener may increase water use by as much as 10 gallons per capita per day or possibly more where water is very hard.

Site and Soil Evaluation

Although the septic tank is important for removing solids from the wastewater, more of the wastewater treatment is provided by the soil. Microorganisms living in the soil profile feed on organic matter in the wastewater, treating and purifying the water as they grow. Four feet of aerated soil below the bottom of the absorption field is necessary to ensure adequate treatment of the wastewater before it reaches the water table or flows laterally due to a restrictive condition.

In sandy soil, it is recommended that as much vertical separation as possible be provided. An understanding of the soil is necessary to assess the ability of the site to provide good wastewater treatment. Soil must absorb the septic tank effluent, treat the wastewater, and transmit treated wastewater away from the soil absorption areas.

The site evaluation begins by reviewing available information such as a published soil survey and then evaluating the soil on site. County soil survey reports are usually available from the local Natural Resource Conservation Service (NRCS, formerly Soil Conservation Service). Contact your local NRCS office, county conservation district or Extension office for a copy of the report.

The soil survey provides general information and serves as a guide to the soil conditions. Sites characterized by slow permeability, restrictive subsoil layer, shallow soil over rock, high groundwater, poor drainage, or steep slopes, as identified in the soil survey, have moderate to

TABLE 1—Soil Limitation Ratings Used by NRCS For Wastewater Absorption Fields

Property	LIMITS: Slight	Moderate	Severe	Restriction or Feature
USDA Texture	—		Ice	Permafrost (not found in Kansas)
Flooding	None, Protected	Rare	Common	Flood water inundates site
Depth to Bedrock (in.)	>[2] 72	40–72	<[3] 40	Bedrock or weathered bedrock restricts water movement or reduces treatment capacity
Depth to Cemented Pan (in.)	> 72	40–72	< 40	Reduces water and air movement
Depth to High Water Table (ft. below surface)	> 6	4–6	< 4	Saturated soil, poor aeration, anaerobic soil, restricted movement
Permeability (in./hr.)				
24–60 in. layers	2.0–6.0	0.6–2.0	< 0.6	Slow perc rate, poor drainage
less than 24 in. layers	—	—	> 6.0	Poor filter
Slope, (percent)	0–8	8–15	> 15	Difficult to construct and hold in place
Large stones greater than 3 in. (percent by wt.)	< 25	25–50	> 50	Restricted water and air movement results in reduced treatment capacity

[1] *The 150 gallons per bedroom, or 75 gallons of wastewater produced daily by each person, assumes at least some water using appliances such as clothes washer, dishwasher, water softener, etc.*
[2] *> means greater than*
[3] *< means less than*

severe restrictions for conventional septic tank–soil absorption systems and other options may be preferred or required.

A site and soil evaluation should be completed in order to locate the area to be used for the absorption field, to verify the soil characteristics, and to size the system. Areas with slopes steeper than about 20 percent will cause considerable difficulty during construction and are not recommended for lateral field installations. Rock outcroppings warn of shallow soils and may suggest the probable direction of groundwater flow. The range of values for each of several properties that cause the soil to be placed in slight, moderate, and severe limitation rating for soil absorption systems is shown on Table 1.

The wastewater system area should be chosen prior to any construction on a site and should be an integral part of the homesite design and development. A soil profile analysis is highly recommended to ensure suitability of the area and to establish the loading rate so that adequate space is available for the absorption field and its replacement.

To perform a soil profile analysis, an excavator is usually used to open a pit which exposes the soil profile. The soil evaluation performed by a trained and qualified person[4] includes examining the soil profile, determining the soil texture, structure, color, consistence, measuring soil depth, and looking for evidence of a high or perched water table or other restrictions. The soil profile should be analyzed to a depth of at least 4 feet below the bottom of the absorption area or at least 6 feet below the surface.

Because OSHA regulations require shoring for trenches deeper than 5 feet for some soils, it is recommended that the pit be constructed so a person is not required to go deeper. Soil below 5 feet can be examined from cuttings, observation from a distance, and by shovel or auger without entering a deeper pit.

At least three pits should be dug surrounding the area to establish the range of soil characteristics that are present on the site, and to determine the best location for the absorption field. Sanitarians, usually through local health or environmental departments, or environmental health specialists, are available to assist in the site and soil

TABLE 2—Design Septic Tank Effluent Loading Rates for Various Soil Textures and Structures

Group	Soil Characteristics	Wastewater Loading (in/day)	(cm/day)	(gpd/ft²)
I	Gravelly coarse sand and coarser	Not Recommended for conventional soil absorption system[5]		
II	Coarse sands (not cemented)	1.8	4.6	1.1
III	Medium sand with single grain structure and loose to friable consistence (not cemented)	1.5	3.7	0.9
IV	Other sands and loamy sands with single grain or weak structure (not extremely firm or cemented consistence).	1	2.5	0.6
	Sandy loams, loams and silt loams with moderate or strong structure (except platy and loose to friable consistence)			
V	Sandy loams, silt loams and loams with weak structure (not of extremely firm or cemented consistence)	0.7	1.7	0.4
	Sandy clay loams, clay loams and silty clay loams with moderate to strong structure (not of platy, of firm, or of cemented consistence)			
VI	Sandy clay loams, clay loams and silty clay loams with weak structure (not massive, not of firm, or of cemented consistence.)	0.4	1	0.25
	Some sandy clays, clays and silty clays with moderate and strong structure (not platy, not of firm, or of cemented consistence)			
VII	Other soils of high clay content with weak or massive structure, extremely firm or cemented consistence or platy, clay pan, fragipan, and caliche soils	Not Recommended for conventional soil absorption system[6]		

NOTE: The above descriptions are estimates and assume that the soil does not have large amounts of swelling clays. Soils with platy structure, massive, compacted or high density should be used with extreme caution or avoided.

[4]A trained and qualified person would include a soil scientist, such as one working for NRCS, environmental health specialist, sanitarian, or other person who has received appropriate soil training and through experience is competent.
[5]Soil is too coarse for conventional soil absorption designs, use pressure distribution dosing or other alternative system to prevent too rapid infiltration.
[6]Soils with these conditions may be acceptable for waste water stabilization ponds or possibly other alternative systems. (See Table 6)

evaluations. A few consultants, either engineers or design/installation contractors, also provide this service.

Table 2 gives the recommended loading rates based on soil texture, structure, and consistence information. These loading rates are based on research that has shown that soil characteristics provide a strong basis for wastewater system design loading rate. Results show system design should be based on the most limiting soil texture found in the first 4 feet of soil below the bottom of the proposed absorption lateral.

Once the wastewater flow (number of bedrooms) and loading rate for the soil are known, the absorption field area needed for the lateral system can be calculated. It is highly recommended that the absorption field and an equal area reserved for future use be marked and fenced so they will not be disturbed during construction. Required setback distances to property lines, wells, surface water, and buildings must be checked and included in the site plan.

Where evaporation substantially exceeds precipitation, as in central and western Kansas, a reduction in soil absorption area may be used when the soil is well suited to wastewater absorption. A well suited soil has medium to coarse texture, perc rates less than 45 minutes per inch and wastewater loading rates of 0.5 gallons per square foot per day or more. For marginal, high clay soil that has low loading rates, no reduction should be used regardless of location in Kansas. Recommended allowable soil absorption system reductions and percent of total absorption area for central and western Kansas is shown on Table 3.

TABLE 3—Recommended Absorption Reductions

	Western Kansas	Central Kansas	Eastern Kansas
Actual absorption area (in percent)	65	80	100
Recommended reduction (in percent)	35	20	0

Since about 1970 considerable research about onsite wastewater systems has occurred. New information, including design procedures, operating characteristics, and many new products, has been and continues to be developed to help improve onsite wastewater systems.

The soil profile evaluation provides a comprehensive assessment of soil characteristics and is the preferred

TABLE 4—Soil Absorption Field Loading Rate and Area Recommendation for Septic Tank Effluent Based on Perc

Perc Rate (minutes/inch)	Recommended Absorption Area (ft²/bedroom)	Loading Rate (gpd/ft²)
Less than 5 minutes	Not recommended for conventional soil absorption system[4]	
5–10 minutes	165	0.91
11–15 minutes	190	0.79
16–30 minutes	250	0.6
31–45 minutes	300	0.5
46–60 minutes	330	0.45
Greater than 60 minutes	Not recommended for conventional soil absorption system[5]	

TABLE 5 Minimum Required and Minimum Recommended Separation Distances for Onsite Wastewater Systems

Separation Distances	Minimum Distance (ft.) Required	Recommended[7]
Septic Tank to foundation of house or other buildings	10	10
Soil Absorption System to dwelling foundation	20	50
Any part of a wastewater system to:		
public potable water line	25[8]	25
private potable water line	10	25
property line	10	50
public water supply well or suction line	100[9]	200
private water supply well or suction line	50[9]	100
surface water course	50	100
Wastewater Lagoons to:		
property line	50[10]	200
dwelling foundation	50[10]	200

[4]Soil is too coarse for conventional soil absorption designs, use pressure distribution dosing or other alternative system to prevent too rapid infiltration
[5]Soils with these conditions may be acceptable for wastewater stabilization ponds or possibly other alternative systems. (See Table 6)
[7]These recommended separation distances help assure a minimum of problems, but are no assurance that problems will not result
[8]The minimum distance specified by KDHE guidelines for public water supplies.
[9]The minimum distance required by KAR 28-30-8(a).
[10]When lot dimension, topography, or soil condition make maintaining the required 50 feet separation distance impossible a written variance from the affected property owners shall be obtained and filed with deeds.

method for determining the suitability of the soil to accept and treat wastewater and establish the design loading.

Some local sanitary codes require the perc test and other codes require both a perc test and a soil profile evaluation. "Perc" is short for percolation and has become the preferred term for this test to evaluate soil suitability to accept wastewater. Percolation means water movement through a soil. Since the driving force is gravity, most of the movement will be downward. The perc test really measures an infiltration rate for water into a wet but unsaturated soil at the depth of expected system placement. The procedure for doing a perc test is described in Appendix A (page 14). Once the perc rate is known, refer to Table 4 to determine the loading rate and absorption field area, or use another method specified by the local sanitary code.

Separation of the soil absorption field from buildings, structures, and boundaries is essential to maintain system performance, to permit repairs, to maintain required separation from wells, and to reduce undesirable effects of underground wastewater flow and dispersion. The structures and boundaries to consider include easements, buildings, property lines, utilities, wells and components of the wastewater disposal system. Minimum required and recommended separation distances for private wastewater systems are given in Table 5.

Many soils, especially in eastern Kansas, have properties that restrict their suitability for soil absorption fields. When limiting properties occur in the soil profile, a variation of conventional laterals, wastewater ponds or alternative treatment systems may be used to compensate for the limiting condition. Variations and alternatives that may be considered are summarized in Table 6. When possible, sites with these restrictive conditions should be avoided due to higher cost, larger land area, and greater maintenance requirements for the alternative systems.

TABLE 6--General Alternative Option Guide for Moderate or Severe Limiting Soil Conditions

I	Shallow Permanent, Perched or Seasonal Groundwater • Subsurface drainage system at least 50 feet from the soil absorption area to lower the water table—suitable for moderate or more permeable soil conditions. This alternative creates drainage that must be discharged away from the area. • Variation of conventional lateral trench - Shallow in-ground trench—suitable for groundwater at 1¾ feet or deeper - At-grade lateral system—suitable for groundwater at 1 feet or deeper • Enhanced wastewater treatment[11] by rock plant filter[12] sand filter[13] or aerated tank[14] or other equivalent system[15] followed by shallow soil absorption or wastewater pond • Wisconsin (engineered) mound—suitable for groundwater or other restriction at 1 foot or deeper • Rock-plant filter[12]—suitable for ground water at 1 foot or deeper followed by soil absorption
II	Shallow Bedrock • Wastewater pond—suitable for sites with bedrock at any depth when overexcavated and at least 1½ feet of compacted clay lining is installed • Variation of conventional lateral trench - Shallow in-ground trench system— suitable for bedrock at 4¾ feet or deeper - At-grade lateral system—suitable for bedrock at 4 feet or deeper • Enhanced wastewater treatment[11] options (see I above) followed by shallow soil absorption • Wisconsin (engineered) mound—suitable for bedrock at 1 foot or deeper
III	Rapid Perc Rate (< 5 mpi) or very permeable soil (> 20 in/hr) • Pressurized distribution dosing system to uniformly distribute wastewater throughout the absorption field • One foot lining using loam soil to bottom and sides of the trench to limit water absorption rate
IV	Slow Perc Rate (60 to 120 mpi) or "slow" soil permeability (0.2–0.6 in/hr) • Dual shallow lateral systems in permeable surface soils (each with 60% to 80% of conventional lateral area) with a diversion valve and alternating use of systems • Wastewater pond provided sufficient site area is available to meet all setback requirements • Wisconsin (engineered) mound: suitable for nearly level sites with more permeable surface soil • Enhanced wastewater treatment[11] options (see I above) followed by shallow soil absorption into permeable surface soil
V	Very Slow Perc Rate Soil (> 120 mpi) "very slow" soil permeability (< 0.2 in/hr) • Wastewater pond—suitable for sites with enough site area to meet all setback requirements • Wisconsin (engineered) mound: suitable for level sites with permeable surface soil • Enhanced wastewater treatment[11] options (see I above) followed by shallow soil absorption into permeable surface soil

[11]Enhanced treatment is higher quality than septic tank effluent and may be equivalent to secondary treatment in wastewater treatment terminology, or in some cases even higher quality, comparable to advanced wastewater treatment.
[12]Rock-plant filter provides a higher level of treatment than septic tanks. Due to higher quality effluent, the soil absorption field size may be smaller than for a conventional absorption field system.
[13]Sand filters provide a very high level of treatment. Due to this high quality effluent, the soil absorption field may be smaller than that required for a conventional absorption field.
[14]Aerobic tanks have poor operating records so an operating/maintenance agreement with a reliable supplier is strongly recommended to ensure system performance.
[15]Promising technology is under development that may meet enhanced treatment requirements.

Septic Tank

The septic tank separates the settleable and floatable solids contains an anaerobic environment where bacteria partially decompose the solids, and provides storage for the accumulated sludge and scum The septic tank is sized so that wastewater flow through the tank takes at least 24 hours even with sludge and scum accumulation This detention time permits the settling of solids heavier than water and allows scum, grease and other materials lighter than water to float to the surface before the water is discharged to the absorption field

Septic tanks are designed to handle all the daily flow a household will normally produce and must have sufficient capacity for the minimum recommended volume of at least two times the daily wastewater flow Larger capacity tanks usually mean less carryover of solids, resulting in prolonged life of the soil absorption field Larger tanks require less frequent cleaning and allow for future expansion of the home or times when guests visit. They also have a good cost-benefit return Table 7 gives minimum and recommended capacities for sizing septic tanks

Less solids exiting the septic tank helps extend the life of the soil absorption field because less clogging of the soil pores will occur Septic tank effluent filters are effective in reducing solids and providing an added measure of protection for the soil absorption field so their use is highly recommended

TABLE 7—Minimum and Recommended Septic Tank Capacities Based on the Number of Household Bedrooms [16]

Number of Bedrooms	Septic Tank Capacity (gallons)[17]	
150 gpd/bedroom	Minimum	Recommended
1-3	1,000[18]	1,350
4	1,200	1,800
5	1,500	2,250

Two compartment tanks or two tanks in series also may help If a multiple compartment tank is used, the first compartment shall be sized to contain from one-half to two-thirds of the total tank capacity The total tank capacity is important and should be sized to retain at least two-to-three times the total daily wastewater flow as shown in Table 7 Figure 1 shows a design concept for a two compartment septic tank.

Tanks shall never be closer than 50 feet from any water supply and greater distances are preferred if possible However a 100-foot separation is required if the water source serves a public water supply The septic tank shall not be located closer than 10 feet from any building, in swampy areas, or in areas located within the 100 year flood plain Table 5 gives minimum required and recommended separation distances for onsite wastewater systems

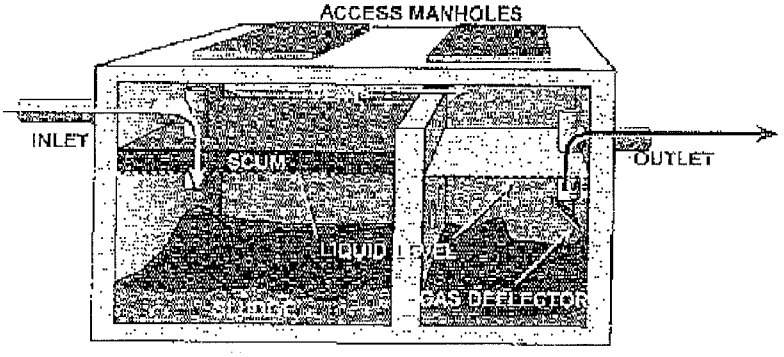
There shall be no permanent structure (patio, building driveway, etc) over the tank, lateral or other part of an onsite wastewater system Consideration should also include easy access of trucks and equipment for pumping, maintenance and repair To avoid damage to the system, heavy equipment should not have to cross any portion of the wastewater system when servicing the septic tank

A sketch of the wastewater disposal system as constructed, showing measurements should be made and delivered to the homeowner for future reference, and filed with the permit at the county health department Figure 3 shows an example septic system reference sketch

Septic tanks and soil absorption systems are an expensive and long-term investment. Material selection design, and construction should be done with long life in mind When located in suitable soil, well designed, properly constructed and adequately maintained, they should last several decades

All abandoned or unused septic tanks cesspools seepage pits or other holes that have received wastewater shall be emptied and plugged following procedures described in K-State Research and Extension bulletin MF 2246

Figure 1– Compartmentalized Septic Tank



[16] *For each additional bedroom, add 300 gallons to the minimum value and 450 gallons to the recommended value.*
[17] *Volume held by the tank below the liquid level (invert of the outlet pipe)*
[18] *Minimum tank size is 1,000 gallons*

Septic Tank Design/Construction Specifications[19]

General Requirements

Figure 2 shows the dimensions included in this section for a typical precast concrete septic tank. The following factors are required of all septic tanks regardless of the construction material:

A The septic tank including all extensions to the surface shall be watertight to prevent leakage into or out of the tank. It shall be structurally sound and made of materials resistant to corrosion from soil and acids produced from septic tank gasses. Because of corrosion, steel tanks are not acceptable.

B The tank liquid depth (distance from outlet invert to bottom of tank) shall be at least 3 feet but shall not exceed 6½ feet. The effective inside length of tanks shall not be less than 1.5 nor greater than four times the effective inside width.

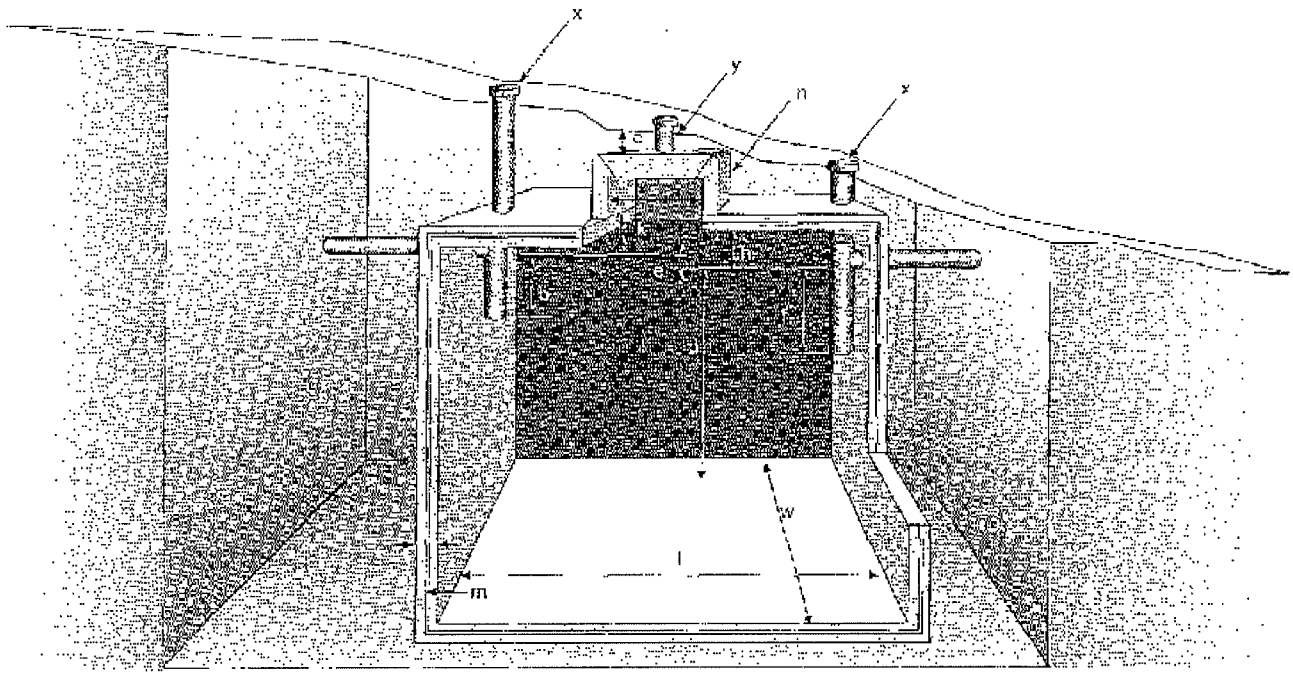
C The minimum septic tank capacity is two times the daily wastewater flow using 150 gallons per bedroom or 1,000 gallons, whichever is larger. See Table 7 for minimum tank sizes. Tanks sized at three times daily flow are recommended and shall be required when garbage disposals are used.

D The top of all tanks shall be designed and constructed to support a minimum uniform load of 400 pounds per square foot plus 2,500 pound axle load. When buried more than 2 feet deep, the tank especially the top, shall support an additional 100 pounds per square foot for each foot of soil or portion thereof in excess of 2 feet.

E If the tank is placed in an area subject to any vehicular traffic it shall be certified to meet H-20 highway loading by a Kansas licensed structural engineer.

F Space above the liquid line is required for that portion of the scum that floats above the liquid. For vertical sidewall tanks, the distance between the top of the tank and the outlet invert should be at least 15 percent of the liquid depth with a minimum

Figure 2—Design Details for a Precast Concrete Septic Tank



Name	Measurement	Min.	Max
a access manhole	smallest dimension	20"	—
b. inlet baffle	penetration	8"	0.2 × d
c cover[20]	surface to manhole	surface	12"
d liquid depth	outlet to tank bottom	3'	6½'
e difference	inlet to outlet inverts	3"	4"
f. outlet baffle	outlet to bottom	0.35 × d	
g thickness	wall	2½"	—

Name	Measurement	Min	Max
h open space	outlet invert to top	7"	0.15 × d
k space	gap	1"	-
l tank length	inside of walls	6'	4 × w
m reinforcement	per engineering design		as needed
n extension riser length[20]		to ≤ 1' from surface grade	
w tank width	inside of walls	4'	
x inspection riser	inside diameter	6"	
y location riser	inside diameter	1½"	

[19]Where locally available products cannot presently meet these requirements, manufacturers will have until July 1, 2002 to comply
[20]If tank is deeper than 12", add extension riser as shown so top of riser is no more than 12" from surface

of 7 inches. In horizontal, cylindrical tanks, an area equal to approximately 12½ percent of the total volume should be provided above the liquid level. This condition is met if the space above the liquid level (distance from outlet invert to top of tank) is 15 percent of the tank diameter.

G. Sewage lines carrying solids from the source to the tank should have sufficient slope to maintain velocities that keep solids moving. For household size lines, a slope of between 1 percent (⅛ inch per foot) and 2 percent (¼ inch per foot) is usually best. The last 15 feet of sewer line preceding the tank shall not slope more than 2 percent (¼ inch per foot).

H. The inlet and outlet baffle or tee and compartment baffle should extend above the liquid level to one inch below the top of the tank. This space at the top of the tank is essential to allow gas to escape from the tank through the house stack vent.

I. The invert of the inlet pipe shall be located at least 3 inches above the invert of the outlet when the tank is level. This space allows for temporary rise in liquid level during discharges to the tank, and prevents liquid from standing in the sewer line between the house and the septic tank, which may cause stoppage or backup.

J. The septic tank or pumping tank inlet shall be a sanitary tee, elbow or long sweep elbow with low head inlet or baffle to direct incoming sewage downward and prevent flow from disturbing the floating scum layer. It should extend at least 8 inches below the liquid level, but should not penetrate deeper than 20 percent of the liquid depth.

K. The outlet tee or baffle prevents scum from being carried out with effluent, but limits the depth of sludge that can be accommodated. The outlet device should generally extend below the liquid surface a distance equal to 35 percent of the liquid depth. For horizontal, cylindrical tanks, this distance should be reduced to 30 percent of liquid depth.

Example: Horizontal cylindrical tank 60 inches in diameter, liquid depth = 52 inches, outlet tee penetrates 52 × 30 = 15.6 inches below liquid level.

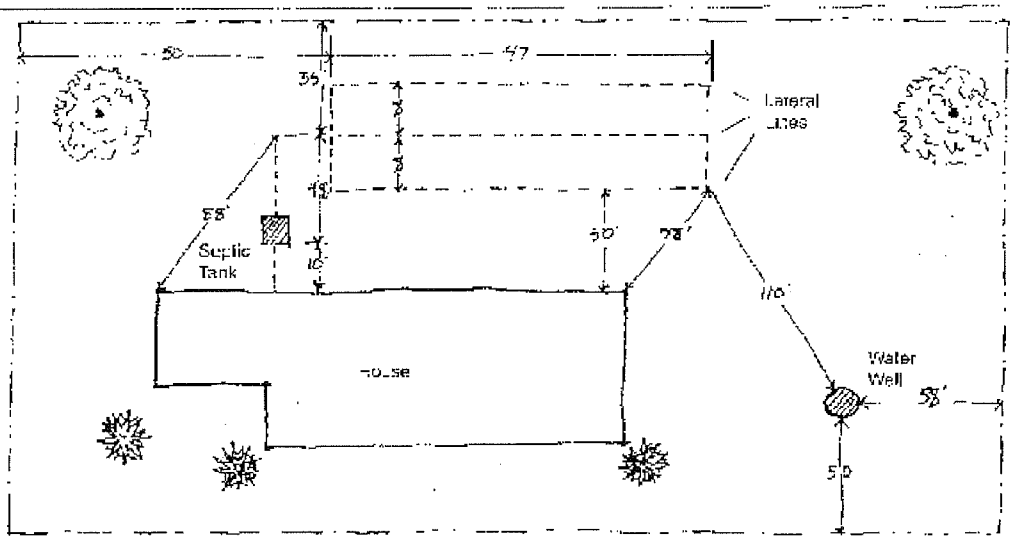
L. Inlet and outlet openings shall be designed and constructed to be water tight for at least a 20-year life of the system.

M. The dividing baffle in two compartment tanks shall extend from the bottom of the tank to at least 6 inches above the liquid line. The opening in the dividing baffle may be any shape and shall be at least 2 inches minimum dimension with a total area of at least 12 square inches. The baffle opening is to be centered 35 percent of liquid depth (30 percent for cylindrical tanks) below the liquid level.

N. Septic tanks shall have an access manhole with 20 inches minimum dimension for each compartment. If the manhole does not extend to surface grade, a small diameter (at least 1½ inch diameter) pipe shall extend to surface from the cover to mark the location of the manhole. This pipe shall not penetrate the lid of the tank. Inspection risers at least 6 inch diameter shall extend to surface grade centered over the inlet and outlet tees. All below grade attachments to the tank, connections, riser extensions and lid shall be water tight. When any opening larger than 8 inches extends to the surface, that opening shall be child and tamper resistant. Ways to accomplish this include lids weighing at least 65 pounds, locks or anchors that are not removable without special tools.

O. The sewer line from the house to the tank, all fittings and pipe in the tank, all extensions to the

Figure 3—Septic System Reference Sketch



surface from the top of the tank and the first 10 feet exiting the tank shall be schedule 40 pipe or heavier

F Septic tanks shall be designed for at least a 20 year life. They shall be designed and constructed to withstand extremes in loads resulting from adverse conditions without excessive deflection, deforming creep, cracking or breaking. Change in shape shall be limited to 5 percent. Loads shall be based on 62.4 pounds per cubic foot for water and water saturated soil. Top loads for design shall be in uniform 400 pounds per square foot plus 2,500 pound axle point load. Design shall be based on a 2 foot placement depth to top of the tank. If the tank will be placed deeper than 2 feet or subject to vehicular traffic over the tank, a design by Kansas licensed structural engineer shall be done for the specific conditions

Special Considerations for Concrete Tanks

The anaerobic environment of a septic tank produces gases that combine with moisture to produce acids. Concrete above the liquid level is subject to corrosion and deterioration from these acids. This corrosion is best resisted by high quality concrete mix. Concrete septic tanks shall meet the following requirements in addition to those above:

A The concrete design mix shall be for a compressive strength of at least 4,000 pounds per square inch at 28 day cure. The water-cement ratio shall not exceed 0.45

B Baffles or other interior concrete units shall not be used for precast or poured in place concrete septic tanks unless they are cast or built into the tank wall at the time the tank is constructed

C Air entrainment additives shall be added to 5 percent volume. Other chemical admixtures are encouraged to reduce water content, improve cement placement in forms and wet handling of incompletely cured concrete

D Concrete tanks and lids shall receive proper care during the hydration (hardening) period by: 1) monitoring and controlling temperature of the concrete and gradients (i.e. maintain 50 to 90 degrees Fahrenheit for conventional cure and up to 140 degrees Fahrenheit under low pressure steam cure.) 2) monitoring and controlling humidity to prevent adverse moisture loss from fresh concrete (i.e. prevent or replenish loss of essential moisture during the early relatively rapid stage of hydration.)

E Reinforcing steel shall be placed as designed by a Kansas licensed structural engineer to ensure floor, wall, and top do not crack from moisture, frost, soil load, water loads, axle loads, or other stresses. Loads as specified above shall be used for the design condition. Reinforcing steel shall be covered by a minimum of 1 inch of concrete and shall be placed within ± ¼ inch

F. Pouring the floor and walls of the septic tank at the same time (monolithic pour) is the preferred construction procedure. Very large tanks are often cast in 2 pieces and assembled in the field. All tanks shall meet the same structural strength standard as specified earlier. Two piece tanks shall have permanently sealed structurally sound joints and shall be water tested after assembly. A Kansas Licensed structural engineer shall determine if the tank meets the strength specification

G In areas of high sulfate water (greater than 250 mg/L) more acid producing gases are likely and additional corrosion resistance is appropriate. Recommended measures include ASTM C150 Type II cement (moderate sulfate resisting), ASTM C150 Type V cement (highly sulfate resisting), or coating interior concrete surfaces above the water line. Coatings that provide additional protection of the concrete include asphalt, coal tar, or epoxy. The product used should be acid resistant and provide a moisture barrier coating for the concrete. The product must not bleed into the water and thus risk groundwater contamination

H Manufacturers are strongly urged to follow guidelines and meet standards of American Concrete Institute, National Precast Concrete Association, and American Society for Testing and Materials. Manufacturers should identify and advertise their products that meet applicable standards

Special Considerations for Fiberglass, Fiberglass Reinforced Polyester, and Polyethylene Tanks

A. All tanks shall be sold and delivered by the manufacturer completely assembled

B Tanks shall be structurally sound and support external forces as specified above when empty and internal forces when full. Tanks shall not deform or creep resulting in deflection more than 5 percent in shape as a result of loads imposed

C Tanks and all below grade fittings and connections shall be water tight.

Septic Tank Placement Specifications

A During the process of placing the septic tank, avoid causing compaction in the absorption field by not entering the absorption field area

B Where natural soil is not suitable tanks shall be placed on a bed of at least 4 inches of sand, pea gravel, or crushed granular noncorrosive material for proper leveling and bearing. Material shall be no larger than 2 inches in diameter and bed depth shall be at least four times the largest material diameter

C Access manholes should be at surface grade, but shall not be more than 12 inches below surface grade. Where top of the tank must be more than 12 inches below surface grade, a water tight extension collar shall be added as required to raise the cover. Inspection openings placed over inlet and outlet tees or baffles shall be at least 6 inches in diameter and extend to the surface to permit easy tank inspection, cleaning of effluent filter, checking condition of tee or baffle and sludge accumulation.

D Septic tanks should not be placed into the water table (including perched or seasonal water table) because of the tendency of the tank to float, especially when empty, as when pumped for maintenance. In any area subject to high water table or seasonally high water table, plastic and fiberglass tanks shall not be used unless precautions are taken to drain groundwater.

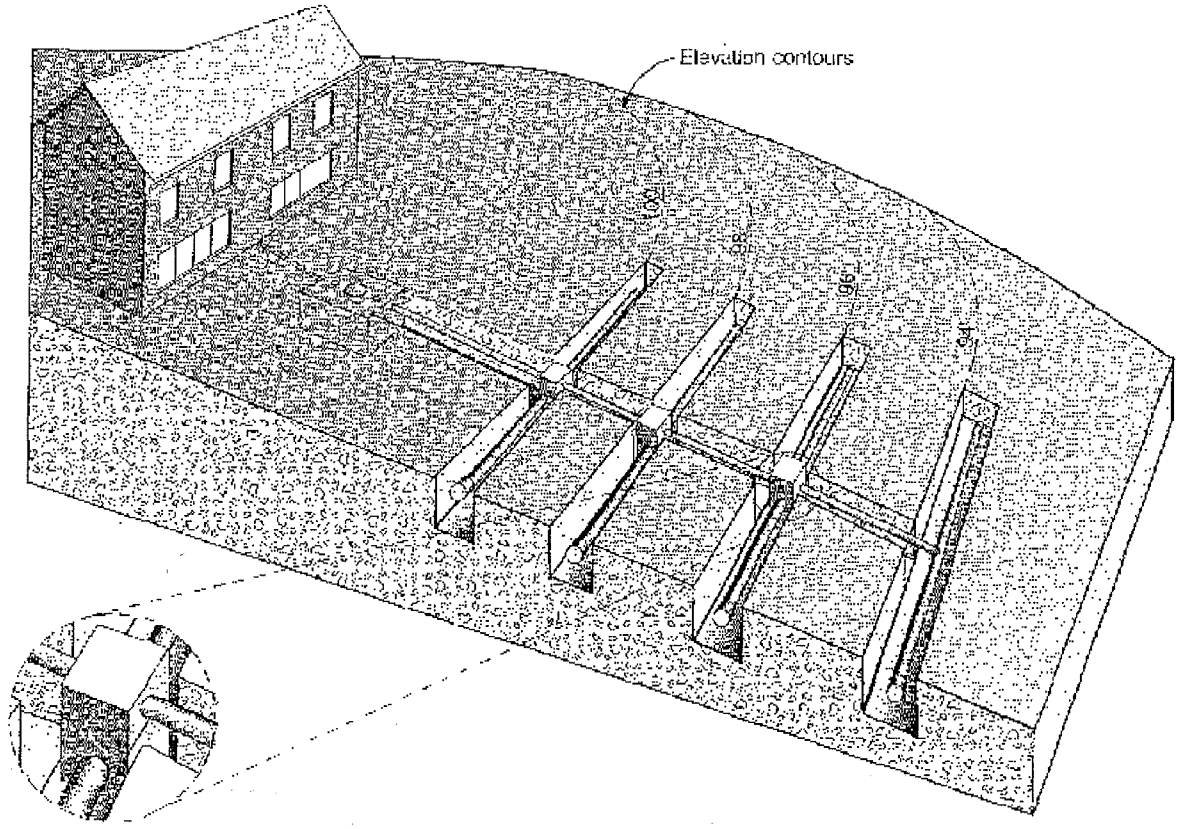
E Septic tanks shall be water tight. An adequate test for water tightness is to fill the tank with water and let it stand for 8 hours to allow concrete to absorb water and plastic tanks to adjust. Then the tank is topped off and an initial measurement made with a hook gauge with vernier scale. After an hour another measurement is made. Any loss is cause to reject the tank. Observations of the outside of the tank can also give clues about leakage losses. Any trickle, ooze or exterior wet spot is reason to reject the tank. Precast one piece tanks are best tested at the plant before delivery. Two piece tanks that are assembled on-site must be tested following placement but before back filling.

F The hole that the tank is placed into shall provide ample space around the tank for access to do compaction. Backfill shall be in uniform, compacted layers not exceeding 2 feet thick and surrounding the tank. Because of potential soil collapse, it is unsafe and may be illegal for a person to enter a trench deeper than 5 feet without adequate shoring. Compaction should be done from the surface without entering trenches deeper than 5 feet.

Absorption Field Size

Absorption field area is dependent on two factors: wastewater flow and soil loading rate. The wastewater design flow is based on the number of bedrooms allowing 150 gpd per bedroom (75 gpd per person) as discussed previously. The wastewater flow assumes the house is fully occupied with two persons per bedroom.

Figure 4 Typical Step Down or Serial Distribution System



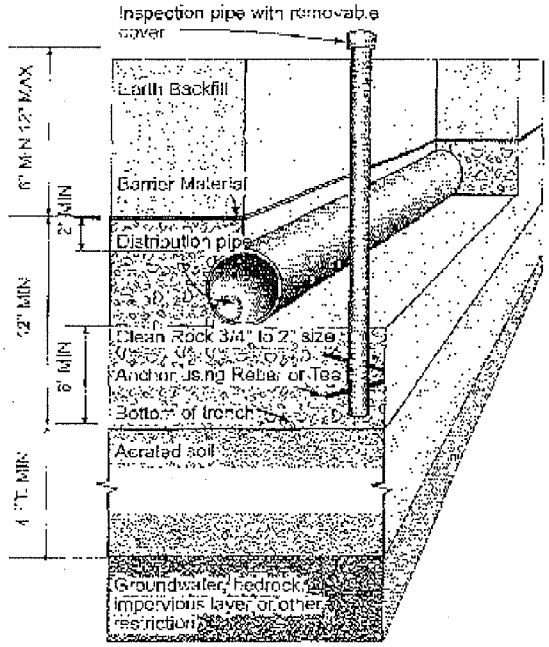
The site and soil evaluation previously discussed in that section is essential for good design. The loading rate is determined from the soil profile using Table 2 or from the perc rate using Table 4 or by using another method as specified in the local code. The soil absorption area is obtained by dividing the wastewater flow in gallons per day (gpd) by the loading rate (gpd per square foot (ft^2))

The maximum gravity lateral run shall not exceed 100 feet and preferably should be less than 60 feet. If a lateral is supplied from the center, the total length shall not exceed 200 feet (100 feet in each side) and a maximum of 120 feet is preferred. Lateral systems on level sites with all laterals on the same elevation shall be connected at each end with a level manifold or connector pipes as shown in Figure 3 so there are no dead ends.

Table 8—Trench Separation Distances

Trench Width (inches)	Recommended Minimum Distance Between Trench Centerline (feet)
18–24	8 0
24 30	8 5
30 36	9 0

Figure 5—Standard Lateral Trench Design



Loading rate example

The following example illustrates how to choose and use the loading rate for design:

- four-bedroom home
- Harney soil: Light silty clay loam with medium subangular blocky structure at 17 to 40 inches
- greater than 6 feet to restrictions of rock or perched water table
- perc rate 40 minutes per inch
- trench width 3 feet
- undisturbed soil width between trenches is 6 feet

Wastewater Flow

Size of house (number of bedrooms) × flow rate (gpd) per bedroom = total daily wastewater production

4 bedrooms × 150 gpd/bedroom = 600 gpd

Loading rate

From soil evaluation Table 2 = 0.4 gpd/ft^2 and from perc test using Table 4 = 0.5 gpd/ft^2

Use the smaller of these or 0.4 gpd/ft^2 for design.

Absorption Area

Wastewater flow ÷ loading rate = absorption area

$$\frac{600 \text{ gpd}}{0.4 \text{ gpd/ft}^2} = \frac{600 \text{ ft}^2}{0.4} = 1{,}500 \text{ ft}^2$$

Trench Length

Absorption area ÷ trench width = length of trench

$$\frac{1{,}500 \text{ ft}^2}{3 \text{ feet}} = 500 \text{ lineal feet of trench length}$$

Field Area

Only the bottom area of the trench is considered in determining absorption area. The absorption trench width should be 18 to 36 inches, preferably 24 inches. For 3 feet wide trenches as in this example, the total lateral length needed is 500 feet. If trenches are 2 feet wide, the total lateral trench length is 750 feet. Assuming that a 3 feet wide trench will be used and 100 feet is the length of each trench, 5 trenches, 100 feet long will be needed for 1,500 ft^2 total trench bottom. To calculate the total area necessary for the field, include the minimum 6 feet of undisturbed soil between trenches. For this example the total width is (5 × 3.0) + (4 × 6.0) = 15 ft + 24 ft = 39 feet. The total field area is 39 × 100 or 3,900 ft^2. An area equal to this same size should be reserved for future expansion and/or replacement.

For sites that slope more than about 1 percent, a level lateral system installed without shaping the surface often requires more than a half foot difference in soil cover from one side of the area to the other. On slopes greater than 1½ percent there is enough slope to use a step down (or serial) distribution. This results in the top lateral

being filled before effluent builds up and flows to the next lateral down slope. Step down or serial distribution as shown in Figure 4 is recommended for all sites that slope 1½ percent or more and/or result in more than 6 inches difference in cover for a level lateral system.

Adjacent absorption field trenches should be separated by at least 6 feet of undisturbed soil. Table 8 shows the minimum spacing for trench widths ranging from 18 to 36 inches. Individual trenches should be constructed on contour with the surface grade and with a level trench bottom to keep the trench cover a uniform thickness.

A minimum of 6 inches of rock or gravel shall be placed in the trench under the distribution pipe, followed by enough gravel to cover the pipe by 2 inches. The soil cover over the trench should not be less than 6 inches to provide adequate water holding capacity for grass nor more than 12 inches to maximize water and nutrient use by vegetation. Generally, the total trench depth should be as shallow as possible, but not less than 18 inches. Perforated distribution pipe shall be used and, where pressure dosing is not required, 4-inch diameter pipe is adequate. See standard lateral trench design and dimensions shown in Figure 5. Where pressure dosing is required, the pipe size should be just large enough to avoid excessive pressure loss (no more than 10 percent) in the distribution lines.

Variations from the standard lateral design described above allow the designer additional flexibility in some restrictive soil situations and are discussed in the site and soil evaluation section and included in Table 6. Many soils in eastern Kansas have a friable, moderately permeable surface soil layer of up to 15 to 18 inches in thickness. Many subsoils have high clay contents and a very restricted permeability. Laterals placed into the tight, very slowly permeable subsoil frequently do not perform satisfactorily.

Shallow in ground laterals dug 6 to 12 inches into the surface soil layer and covered with imported topsoil may be a viable option to achieve a workable soil absorption system for some soil conditions. Shallow in ground systems may overcome marginal conditions such as groundwater or rock over 4½ feet but less than 6 feet required for conventional laterals.

The shallow, rock-filled trench shall be covered with a synthetic geotextile barrier material (at least 3 ounce nylon or 5 ounce polypropylene nonwoven filter fabric) before the lateral and interval between laterals is covered with top soil brought to the site.

In soils with still more restrictive or shallow soil conditions (4 to 4½ feet to restrictions) an at-grade lateral system may be an option. The at-grade lateral involves preparing the soil surface on a level contour in strips much as the first step in constructing a Wisconsin mound. The rock, normally placed in a trench, is placed on the surface. Pressure dosing distribution is used to ensure even water distribution and help prevent horizontal flow at the natural soil surface resulting from temporary ponding in the lateral. The rock lateral shall be covered with barrier material before the lateral and interval space is covered with top soil brought to the site.

Loading rates and other design criteria are basically the same for shallow in-ground and at-grade systems as for conventional lateral trenches. The at-grade lateral requires tilling the soil strip under the lateral on a level contour. A pressure dosing system shall be included as a part of the at-grade design. Distribution lateral line pressure should not exceed 5 feet of head. Orifices in the pipe shall be sized and spaced to evenly distribute flow throughout the lateral system. If the area is too large to pressurize the entire system, a multizone design and sequencing valve shall be used to dose zones in sequence.

The use of an effluent filter on the septic tank outlet is strongly encouraged to prevent solids from plugging the absorption field. This will prolong the life of the absorption field and improve performance of the system. It also helps reduce the strength of wastewater effluent.

Absorption Field Material Specifications

Rigid PVC or corrugated polyethylene plastic pipe meeting American Society for Testing and Materials (ASTM) standard ASTM D2729-93 and ASTM F405-93 or latest edition respectively meet minimum standards for use as solid or perforated gravity distribution lines. All materials used in the plumbing, wastewater line and lateral fields shall meet standards specified by ASTM. In gravity lateral pipes, perforations are circular, ½-inch diameter and are placed at 4 and 8 o'clock positions on the pipe circumference. In no circumstance is slotted pipe acceptable as the narrow slot openings plug easily.

Washed gravel or crushed stone is commonly used as the porous media for the trench. The media gradation shall be ¾ inches to 2 inches in diameter, with the smaller sizes preferred to reduce masking of the infiltration surface. Uniform size is preferred because more void space is created. Rock having a hardness of three or more on the Moh's Scale of Hardness is required. Rock that can scratch a penny without crumbling or flaking generally meets this criterion. Larger diameter and smaller diameter material, or soft aggregate such as calcite limestone are not acceptable and shall not be used.

Fines should be eliminated as much as possible. Fines shall not exceed 5 percent by volume, so unwashed material is generally unacceptable. A simple test is to wash a volume of material into a clear container of the same diameter and measure fines (5 inches of gravel should produce no more than ¼" of fines).

When suitable rock or gravel is not locally available is expensive, or access to the site is restricted, gravelless chambers are good choices for laterals. They have the advantage of more liquid storage capacity, reducing the effect of high flows or loadings on weekends or holidays. Chamber systems are lightweight making installation easier at sites with restricted heavy equipment access. Chambers also may be recovered for reuse in the future. Before using chambers, consult the local authority to identify requirements.

Chunks of recycled tires are a suitable substitute for rock. Ninety percent of the pieces should be ½ to 4 inches in size with no fines. Wire strands shall not extend more than ½ inch from the pieces.

The porous media shall be covered with a filter fabric (at least 3 ounce nylon or 5 ounce polypropylene) before backfilling to prevent soil from sifting through the media. Traditional untreated building paper or 3-inch layer of straw are inferior second choices or are not recommended. Filter fabric is required when tire pieces are used as the porous media. Materials relatively impervious to air and moisture are not permitted.

Field Construction Specifications

Protection of the absorption field area begins before any activity on the site. The site and soil evaluation identifies the best lateral field area and reserve area. Heavy equipment, such as loaded trucks, should be kept away from the absorption field by marking the site. The weight of such equipment can permanently alter soil characteristics due to compaction. Excessive equipment or foot traffic can compact even relatively dry soils.

Construction of septic tank-lateral field systems when the soil is too wet causes compaction and smearing of the soil structure, greatly reducing the water absorption and treatment efficiency of the system. A good test for this is to work the soil into a ball and roll between the hands. If it can be rolled out into a soil wire ¼ inch in diameter or smaller without falling apart, it is too wet and construction should not proceed.

Before beginning construction, contours should be determined and level lateral locations should be marked by flags or stakes on the contour. Trenches shall not be excavated deeper than the design depth or wider than the design width. Following excavation, the trench sides and bottom shall be raked to remove any smearing and graded to assure a bottom with no more than 1 inch difference in elevation along the entire lateral length or the complete field for a level system. The lateral pipe and rock cover shall not vary more than 1 inch in elevation along the lateral length using a surveyor level or laser.

The trench bottom should then be immediately covered with at least 6 inches of rock or the chamber. Distribution pipes are carefully placed on the rock and leveled with perforations at 4 o clock and 8 o clock positions. Rock is placed around and over the pipe to a cover depth of at least 2 inches.

After rock and pipe have been placed in the trench, the filter fabric or other barrier shall be placed to protect from soil movement into the rock. Finally, earth backfill shall be carefully placed to fill the trench cavity. The backfill shall be mounded above the trench about 20 percent of the soil fill height to allow for settling. If a variation in the trench depth is used, topsoil also must be placed between laterals as well as over the lateral to level the site.

Maintaining Onsite Wastewater Systems

The homeowner's responsibility for onsite wastewater treatment and disposal does not end when the backfill is placed over the trench lines and wastewater introduced. Maintenance of the system is a critical factor to ensure long life and continued effectiveness of the system. Minimum annual maintenance criteria include:

- check the sludge and scum in the tank to determine pumping requirements; tanks need to be pumped regularly depending on wastewater flow and tank size, (often 3 to 5 years),
- check the baffles or tees to ensure they are intact, secure and in good condition,
- check the septic tank and soil absorption area monthly for indications of leaks or failure,
- check observation ports in each lateral to ensure effluent is reaching all parts of the system,
- check effluent filter and clean as needed.

Refer to K-State Research and Extension bulletins listed at the end of this document for additional information. A file containing records of repairs, pumping, site plan of the system, annual checklist, and other pertinent information should be maintained for easy reference and for information when ownership changes.

Wastewater Stabilization Ponds

Wastewater ponds, sometimes called lagoons, are a viable sewage treatment method and should be considered for individual household wastewater where soil conditions have severe limitations for conventional lateral absorption field systems. Single family wastewater ponds should not be considered if septic tank–lateral field systems are feasible as determined by local requirements or recommendations contained in this bulletin. Wastewater ponds are especially applicable on sites with very restrictive permeability, high clay subsoil (i.e. slow perc rates) or shallow bedrock where adequate area is available.

A wastewater pond is a small pond with a maximum 5-foot operational water depth, which receives domestic wastewater. Size, as in a soil absorption field, is deter-

mined by the number of occupants and thus the wastewater flow, the soil and evaporation.

Wastewater enters the pond by a pipe outlet near the bottom close to the center of the lagoon. All private wastewater ponds must be nondischarging and must be fenced. Wastewater ponds require a sizable area, including water surface, embankment, and separation distances. Maintenance is required to remove vegetation at the water's edge, to mow vegetation on embankments, and to remove trees that will shade the pond. Odors from a properly designed, installed, and maintained pond are infrequent and minimal.

Individuals considering wastewater ponds for sewage treatment should first check with county or other local authorities to determine requirements. Proceed with any private sewerage facility only when public sewers are not available and all applicable local requirements are met. Refer to K-State Research and Extension bulletins on wastewater ponds for more information and guidance.

Alternative Systems Guidelines

Kansas Administrative Regulations (K.A.R. 28-5-9) authorize county health departments or other authorized local agency in counties that have local codes, to grant a variance for alternative onsite wastewater treatment and disposal systems. Most county codes contain a variance clause that authorizes the local administrative agency to grant requests for variances provided that certain conditions are met. The request for variance is filed with the county administrative agency. The local agency can consult with KDHE for technical assistance in evaluating the system, but has the authority to issue the variance locally if there is a local code.

No private onsite wastewater system shall have a surface discharge.

When there is no local code KDHE is authorized by regulation to grant a variance. Onsite wastewater treatment options that might be considered for variance include enhanced wastewater treatment options such as aerated tank, sand or media filter, rock-plant filter, or other equivalent system. Design, construction, operation, and maintenance criteria or guidelines are planned but are not yet available for use in Kansas.

Some county codes require that design and specifications for alternative systems be completed by a licensed professional engineer. Engineers should be adequately trained or have experience under adequate supervision before designing alternative systems. Results show that design by an inexperienced engineer can not produce a more reliable or long life alternative than conventional systems. Some alternative systems involve complex design and specific construction criteria that can result in dramatic failure when violated.

Appendix A

Conducting a Perc Test

Water movement through soil in response to gravity is called percolation. For wastewater soil absorption field evaluation, the absorption of water from a post-type hole is a method for the evaluation for soil suitability and loading rate design. The absorption of water from this hole involves water movement in 3 dimensions and forces other than gravity. The term "perc" test is applied to this evaluation. The purposes of this test include:

- Obtaining the rate at which wet, unsaturated soil will absorb water.
- Helping assess suitability of soil on a specific site to absorb septic tank effluent.
- Helping select from among alternative onsite sewage systems and establish a design loading rate.

To ensure the best evaluation, all available soil information should be utilized. This would include assessment of restrictive conditions such as high water table, perched water table, shallow depth of soil, and restrictive layers such as clay pan; soil profile evaluation from the site, including history of high water tables; and description of soil profiles from county soil surveys.

Brief Description

A minimum of four to six holes are placed throughout the proposed site of the absorption field and at the depth of the proposed laterals and soaked with water until the clay is swelled, usually for at least 24 hours. The perc rate is measured in each hole and reported as the number of minutes it takes for an inch of water to be absorbed in the hole. The optimum time to conduct a perc test is in the spring when the soil is normally wet. An accurate perc test during a dry period when the soil is cracked may not be possible.

Materials Needed to Conduct the Perc Test

1. Site plan including proposed absorption field and location of tests. Dimensions help ensure the test holes are properly located in and around the field.
2. One batter board--1 inch by 2 inch board of 18 inches long for each perc test hole.
   - A. Number each board so that each test hole will be distinguishable.
   - B. Mark a center line on the side of each batter board. This will provide a consistent reference point for the measuring device.
3. Durable measuring device (1 to 2 feet long) and a way to reproducibly locate the water surface, such as a pointed hook or float on a stiff wire or rod.
4. An adequate supply of water to soak the hole and conduct the test. Water usually has to be transported to the site. Two hundred to 300 gallons is usually adequate.

Procedure

1 **Identify Proposed Site of Absorption Field**—The site preferably should be located downslope from the septic tank. If effluent will not flow by gravity, an effluent pump may be used to move effluent to a suitable absorption field. For new homesites, the proposed area reserved for future use should also be checked for suitability.

2 **Number and Location of Tests**—Locate a minimum of four to six holes uniformly over the proposed absorption field site. If the site is sloping, it is especially important to have test holes at all elevations to be used so that any differences in soil will be evaluated.

3 **Type of Test Hole**—Dig or bore each hole to the depth of the proposed trench (usually 18 to 24 inches) and with a consistent diameter (8 inches is recommended). All test holes shall be the same size to help ensure consistency in results.

4 **Prepare the Test Hole**. Scratch the sides and bottom of the hole to eliminate any smeared or compacted soil surfaces and remove loose material from the hole. Place 2 inches of washed gravel in the bottom of the hole. The gravel can be contained in a mesh bag for easy removal and reuse at other sites. This gravel protects the bottom of the hole from erosion, scouring, and sediment as water is introduced.

5 **Wet Hole to Allow for Soil Swelling**. Saturation means that the voids between the soil particles are filled with water. This happens fairly quickly for soil immediately surrounding the portion submerged in water. Swelling is caused by intrusion of water into the clay particles and can take many hours and possibly days when the soil is quite dry.

- A Carefully add 12 to 14 inches of water. Using a hose will prevent soil washing down from the sides of the hole.
- B Maintain the water level for at least 24 hours to allow for swelling to occur. In most cases it will be necessary to add water periodically from a reservoir. A float supplied by a hose from a reservoir simplifies the procedure.
- C If the soil appears to be sandy or initially very dry, plan to check the condition of the hole wetting after 12 hours or overnight. If there is no water left in the hole and the reservoir is dry, refill the reservoir and holes. After the full 24 hours have passed since soaking was initiated, begin measuring as described in #6.

6 **Perc Measurement**

- A Remove the apparatus used to add water to the hole.
- B Place the batter board across the top of each hole and secure with weights, spikes or attach to stakes. Be sure that the centerline mark is centered over the hole and each board is numbered.
- C Align the measuring rule with mark on the board and use the hook gauge or the float and rod to read the level when it just touches the water surface. Record the measurement and time. Fill the hole to about 6 inches over the rock and make the initial measurement.
- D Measure at 30-minute intervals (does not have to be exact) recording both level and time. If the water level in the hole drops too rapidly, it will be necessary to reduce the time interval for measurement. The time interval should be short enough that the water level should not drop more than 25 percent of the wetted hole depth.

Note: If the water drops more than 1 to 2 inches in 30 minutes, it will be necessary to add water to the hole after each reading until it is the same depth as recorded initially. Be sure to record the measurement of the refilled perc hole.

7 **Calculate Perc Rate**. Divide time interval by drop in water level to find the perc rate in minutes per inch (mpi).

Examples:

If the drop is ⅜ inches in 25 minutes:

$$\frac{25}{\frac{3}{8}} = 25 \times \frac{8}{3} = 40 \text{ mpi}$$

If the drop is 1½ inches in 12 minutes:

$$\frac{12}{1\frac{1}{2}} = \frac{12}{\frac{3}{2}} = \frac{12 \times 2}{3} = 8 \text{ mpi}$$

- A Continue measurements until each of three consecutive calculated rates varies by no more than 10 percent from the average of the three rates. Use the average of three rates as the value for that hole.

Example:
Rates of 26.0, 28.0 and 30.5 mpi average 28.2 mpi

- B Measure and calculate the rate for each hole in the application field. Average the rates for all holes as the value to use for loading rate and bottom area sizing.

8 **Compare with Permeability in the NRCS Soil Survey**. The field measured perc (mpi) should be no smaller than about one third the inverse of the permeability rate shown in the table of physical and chemical properties of soils in the soil survey report. If it is, suspect a problem with the perc test, soil mapping or other cause. A well aggregated, undisturbed soil may have a good perc rate.

Appendix B

Sources of Additional Information

Kansas State University, Agricultural Experiment Station and Cooperative Extension Service Bulletins[21] (except as noted)

Wastewater Systems and Related Information

Design of Submerged Flow Wetlands, Special Report 457 Missouri Small Flows Education and Research Center, Agricultural Experiment Station, University of Missouri Columbia, MO 65211

Environmental Health Handbook First Edition, Aug 1992, Kansas Association of Sanitarians, KDHE, and K-State Research and Extension cooperating available from K-State Extension Biological and Agricultural Engineering, Cost: $20 00[22]

Get to Know Your Septic System, MF-2179

How to Run a Percolation Test, FO-0583-C, (Revised 1993), Minnesota Extension Service, University of Minnesota, St. Paul, MN 55108

Onsite Domestic Sewage Disposal Handbook, MWPS-24, Midwest Plan Service. Iowa State University, available from K-State. Extension Biological and Agricultural Engineering, Cost: $6 00[22]

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Rock-Plant Filter Operation, Maintenance and Repair expected 1997

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Septic Tank—Soil Absorption System, MF-944

Soil Evaluation for Home Septic Systems, MF-945

Wastewater Pond Design and Construction, MF-1044

Wastewater Pond Operation, Maintenance, and Repair, MF-2290

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Your Wastewater System Owner/Operator Manual S-90 For sale bulletin, cost 35c

Other Helpful Bulletins

Kinds and Types of Levels, LR-17[23]

Land Judging and Homesite Evaluation, S-34

Operating, Checking and Caring for Levels, LR-101[23]

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Soil Water Measurements: An Aid to Irrigation Water Management, I-795

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ASTM C267-82 Standard Test Method for Chemical Resistance of Mortars Grouts and Monolithic Surfacings Vol 04 05

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ASTM C890-91 Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures Vol. 04 05

ASTM C1227-94 Standard Specification for Precast Concrete Septic Tanks Vol 04 05

ASTM D1600-94 Standard Terminology for Abbreviated Terms Relating to Plastics Vol 08 04

ASTM D2321-89 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications Vol. 08.04

ASTM D2729-93 Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings. Vol 08 04

ASTM F481-94 Standard Practice for Installation of Thermoplastic Pipe and Corrugated Tubing in Septic Tank Leach Fields Vol. 08 04

ASTM F405-93 Standard Specification for Corrugated Polyethylene (PE) Tubing and Fittings Vol. 08 04

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ASTM F449-93 Standard Practice for Subsurface Installation of Corrugated Thermoplastic Tubing for Agricultural Drainage or Water Table Control Vol. 08 04

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[21] *Production Services/Distribution, Kansas State University, 28 Umberger Hall, Manhattan, KS 66506-3402, Phone. (785) 532-1150*
[22] *Available through Extension Biological and Agricultural Engineering, Kansas State University, 237 Seaton Hall, Manhattan KS 66506-2917, Phone (785) 532-5813*
[23] *American Concrete Institute, P.O. Box 9094 Farmington Hills, Michigan 48333, Phone: (810) 848 3808*
[24] *American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 Phone (610) 832-9500*
[25] *National Precast Concrete Association 10333 North Meridian Street, Suite 272 Indianapolis, Indiana 46290 Phone (317) 571-9500*

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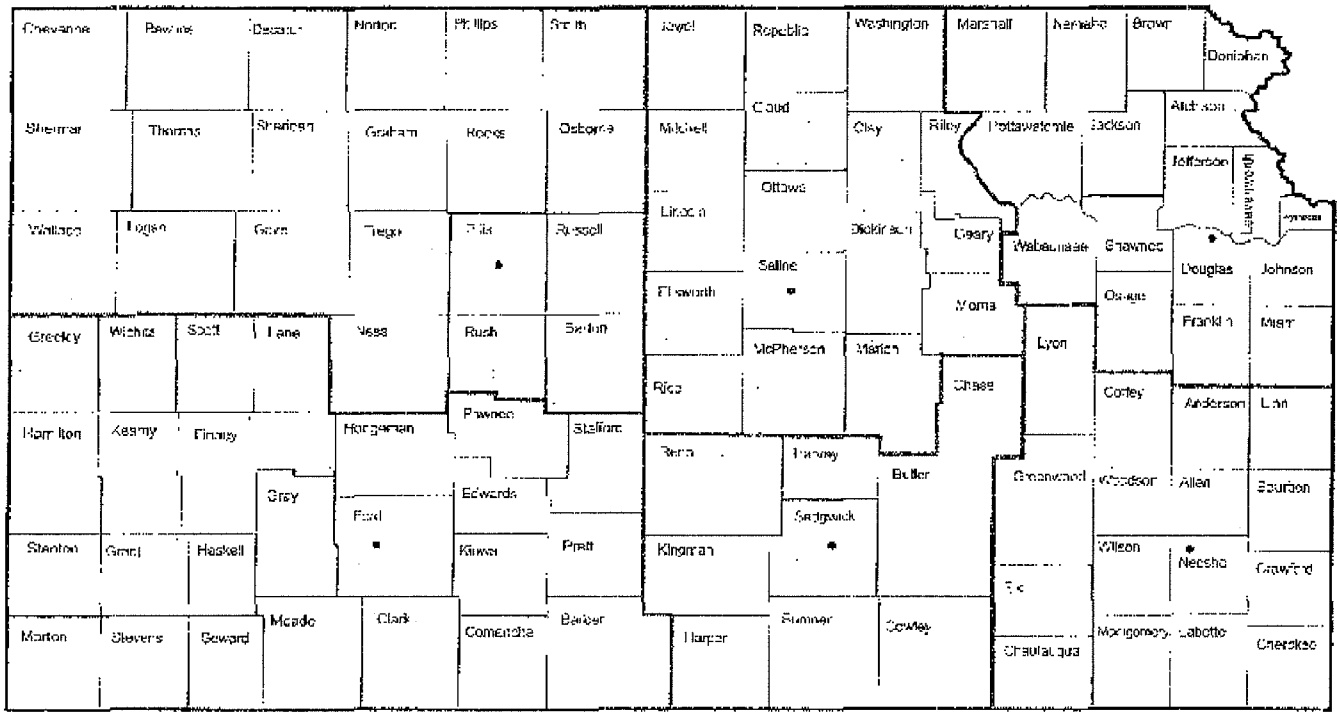

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