TITLE III PUBLIC WORKS

CHAPTER 1 RESIDENTIAL ON-SITE SEWAGE TREATMENT

3-1-1 TITLE

The Title of this Chapter Shall be "On-Site Wastewater Treatment and Disposal Systems."

3-1-2 PURPOSE

To promote public health in Bremer County, Iowa, by assisting in the enforcement of state health laws and providing such reasonable standards consistent with law and with the rules of the Iowa Department of Natural Resources, pertaining to on-site sewage treatment facilities, as are deemed necessary for the protection and improvement of the public health, in accordance with the provisions of Chapter 137, Code of Iowa, 1995.

3-1-3 APPLICABILITY

Provisions herein are applicable to all on-site sewage treatment systems located within Bremer County, Iowa.

1. In the event of a difference between the provisions of this ordinance and those Contained in Chapter 567- 69, Iowa Administrative Code - Environmental Health the most stringent standards will prevail.

3-1-4 PERMIT REQUIRED

No on-site wastewater treatment and disposal system shall be installed, altered, or reconstructed until an application for a permit has been submitted and a permit has been issued by the administrative authority. The installation shall be in accordance with these rules.

APPLICATION FOR PERMIT TO CONSTRUCT, RECONSTRUCT, OR ALTER PRIVATE ON-SITE SEWAGE TREATMENT SYSTEM

1. Any person, firm or corporation desiring to construct, reconstruct, or alter a private sewage treatment system shall file with the Bremer County Health Department an application stating therein the owner's name, correct legal description of the property on which the system will be installed, as well as the correct house number, name of street, if any, city or town, and other such information as may be required.

2. Upon approval of the application by the public health sanitarian, or local board, or its designee, a permit shall be issued.

3. Permit shall be displayed at the site during construction period so as to be plainly visible from the roadway.

4. Permits are not transferable.

5. Until final approval, no private on-site sewage treatment system shall be covered, or so constructed so as to deny a thorough final inspection by the public health sanitarian or designed representative of the board.

6. No private on-site sewage treatment system for which a permit has been granted Under this section shall be put in operation until the construction, reconstruction or alteration has been inspected and approved by the public health sanitarian or designated representative of the board.

7. Permits shall expire and have no further validity if the construction, reconstruction, or alteration is not completed within a period of one year from the date of issuance.

8. The permit shall be signed by the public health sanitarian upon certification of proper tank size, adequate secondary treatment, and following inspection of the entire system. All deficiencies shall be corrected before system is put to use.

3-1-5 FEES

1. The fee for a permit to construct, reconstruct, or alter a private sewage disposal system shall be payable at the time of application.

2. Permit fees are not refundable.

3. The fee schedule shall be as adopted by resolution of the Board of Supervisors

4. Whenever any work for which a permit is required by this ordinance has been Commenced without first obtaining said permit, a special investigation shall be made before a permit may be issued. The investigation fee shall be equal to the amount of the permit fee as required by this ordinance.

3-1-6 REQUIREMENTS WHEN DISCHARGED INTO SURFACE WATERS.

All discharges from on site wastewater treatment and disposal systems, which are discharged into any surface water shall be treated in a manner that will conform with the requirements of NPDES General Permit No.4 issued by the department of natural resources, as referenced in rules 567-chapter 64. Prior to the installation of any system discharging to waters of the state, a notice of intent to be covered by NPDES General Permit No. 4 shall be submitted to the department. Systems covered by this permit must meet all applicable requirements listed in the NPDES permit.

3-1-7 REQUIREMENTS WHEN DISCHARGED INTO THE SOIL.

No septage or wastewater shall be discharged into the soil except in compliance with the requirements contained in these rules.

3-1-8 DEFINITIONS

1. Administrative authority is the Bremer County Board of Health as authorized by Iowa Code chapter 137.

2. Approved means accepted or acceptable under an applicable specification stated or cited in these rules, or accepted as suitable for the purposed use by the administrative authority.

3. Area drain means a drain installed to collect surface or storm water from an open area of a building or property.

4. Building drain is that part of the lowest horizontal piping of a house drainage system which receives the discharge from the soil, waste, and other drainage pipes inside the walls of any building and conveys the same to the building sewer.

5. Building Sewer is that part of the horizontal piping from the building wall to its connection with the main sewer or on-site wastewater treatment and disposal system conveying the drainage of one building site.

6. Chamber System is a buried structure, typically with a domed or ached top, providing at least a six-inch height of side wall soil exposure, creating a covered open space above a buried soil infiltration surface.

7. Conventional when used in reference to sewage treatment means a soil absorption system involving a series of two-foot wide trenches filled with gravel one foot deep, containing a four-inch diameter rigid pipe to convey the sewage effluent.

8. Distribution Box is a structure designed to accomplish the equal distribution of wastewater to two or more soil absorption trenches.

9. Drainage Ditch is any watercourse meeting the classification of a "general use segment" under rule 567--61.3(455B) which includes intermittent watercourses and those watercourses which typically flow only for short periods of time following precipitation in the immediate locality and whose channels are normally above the water table.

10. Drip Irrigation is a form of subsurface soil absorption using shallow pressure distribution with low-pressure drip emitters

11. Drop Box is a structure to divert wastewater flow into a soil absorption trench until the trench is filled to a set level, then allow any additional waste, which is not absorbed by that trench, to flow the next drop box or soil absorption trench.

12. Dwelling means any house or place used or intended to be used by humans as a place of residence.

13. Fill Soil means clean soil, free of debris or large organic material, which has been mechanically moved onto a site and has been in place for less than one year.

14. Foundation Drain means that portion of a building drainage system provided to drain groundwater from the outside of the foundation or over or under the basement floor not including any wastewater.

15. Free Access Filter (open filter) means an intermittent sand filter constructed within the natural soil or above the ground surface with access to the distributor pipes and top of filter media for maintenance and media replacement.

16. Gravel means stone screened from river sand or quarried. Concrete aggregate designated as Class II by the department of transportation is acceptable.

17. Gravelless Pipe System means an absorption system comprised of large diameter (8-10 inches) corrugated plastic pipe, perforated with holes on a 120-degree arc centered on the bottom, wrapped in a sheath of geotextile filter wrap.

18. Individual Mechanical Aerobic Wastewater Treatment System means an individual wastewater treatment and disposal system employing bacterial action, which is maintained by the utilization of air or oxygen and includes the aeration plant and equipment and the method of final effluent disposal.

19. Intermittent Sand Filters are beds of granular materials 24 to 36 inches deep underlain by graded gravel and collecting tile. Wastewater is applied intermittently to the surface of the bed through distribution pipes or troughs and the bed is under drained to collect and discharge the final affluent. Uniform distribution is normally obtained by dosing so as to flood the entire surface of the bed. Filters may be designed to provide free access(open filters), or may be buried in the ground (buried filters or subsurface sand filters).

20. Lake means a natural or man-made impoundment of water with more than one are of water surface area at the high water level.

21. Limiting Layer means bedrock, seasonally high groundwater level, or any layer of soil with a stabilized percolation rate exceeding 60 minutes for the water to fall one inch.

22. Mound System is an alternative above-ground system used to absorb effluents from septic tanks in cases where either seasonally high water table, high bedrock conditions, slowly permeable soils or limited land areas prevent conventional subsurface absorption systems.

23. On-site Wastewater Treatment and Disposal Systems means all equipment and devices necessary for proper conduction, collection, storage, treatment, and disposal of wastewater from four or fewer dwelling units or other facility serving the equivalent of 15 persons (1500 gpd) or less. This includes domestic waste whether residential or nonresidential but does not include industrial waste of any flow rate. Included within the scope of these definition are building sewers, septic tanks, subsurface absorption systems, mound systems, sand filters, constructed wetlands, and individual mechanical/aerobic wastewater treatment systems.

24. Percolation Test is a falling water level procedure used to determine the ability of soils to absorb primary treated wastewater. (See Appendix B.)

25. Pond means a man-made impoundment of water with a water surface area of one acre or less at the high water level.

26. Primary Treatment is a unit or system to separate the floating and settleable solids from the wastewater before the partially treated affluent is discharged for secondary treatment.

27. Professional Soil Analysis is an alternative to the percolation test which depends upon a knowledgeable person evaluating the soil factors, such as color, texture, and experience in soil morphology (testing absorption qualities of soil by the physical examination of the soils color, mottling, texture, structure, topography, and hill slope position) shall be required to perform a professional soil analysis.

28. Roof Drain is a drain installed to receive water collecting on the surface of a roof and discharging into an area or storm drain system.

29. Secondary Treatment System is a system, which provides biological treatment of the effluent from septic tanks or other primary treatment units to meet minimum effluent standards as required in these rules and NPDES General Permit No.4. Examples include soil absorption systems, sand filters, mechanical/aerobic systems, or other systems providing equivalent treatment.

30. Septage means the liquid contents (including sludge and scum) of a septic tank normally pumped out periodically and transported to another site for disposal.

31. Septic Tank is a watertight structure into which wastewater is discharge for solids separation and digestion, referred to as part of the closed portion of the treatment system.

32. Sewage Wastewater is the water-carried waste derived from ordinary living processes.

33. Sludge means the digested or partially digested solid material accumulated in a wastewater treatment facility.

34. Stream means any watercourse listed as being a "designated use segment" in rule 567-- 61.3(455B) which includes any watercourse which maintains flow throughout the year, or contains sufficient pooled areas during intermittent flow periods to maintain a viable aquatic community of significance.

35. Subsurface Absorption System is a system of perforated conduits connected to a distribution system, forming a series of subsurface, water-carrying channels into which the primary treated effluent is discharged for direct absorption into the soil (referred to as part of the open portion of the treatment system).

36. Subsurface Sand Filter is a system in which the effluent from the primary treatment unit is discharged into perforated pipes, filtered through a layer of sand, and collected by lower perforated pipes for discharge to the surface or to a subsurface absorption system. A subsurface sand filter is an intermittent sand filter which is placed within the ground and provided with a natural topsoil cover over the crown of the distribution pipes.

37. Wastewater Management District means an entity organized in accordance with permitting legislation to perform various specific functions such as planning, financing, construction, supervision, repair, maintenance, operation, and management of on-site wastewater treatment and disposal systems within a designated area.

3-1-9 GENERAL REGULATIONS

1. Connections to public sewer.

   a. No on-site wastewater treatment and disposal system shall be installed, repaired, or rehabilitated where a public sanitary sewer is available. The public sewer may be considered as not available when such sewer or any building or any exterior drainage facility connected thereto, is located more than 250 feet from any proposed building or exterior drainage facility on any lot or premises which abuts and is served by such public sewer. Final determination of availability shall be made by the administrative authority.

   b. When a public sewer becomes available, any building then served by a private sewage treatment system shall connect to said public sewer within one year from the date of completion of the public sewers.

   c. When a public sanitary sewer is not reasonable accessible, every building wherein persons reside, congregate, or are employed, shall be provided with an approved on-site wastewater treatment and disposal system.

   d. If a building is to be connected to an existing on-site wastewater treatment and disposal system, that existing system shall meet the standards of these rules and be appropriately sized.

2. Construction or alteration. All on-site wastewater treatment and disposal systems constructed or altered after the effective date of these rules shall comply with these requirements. Alteration includes any changes that effect the treatment or disposal of the waste. Repair of the existing components that does not change the

treatment or disposal would be exempt. However, the discharge restrictions in 3 below would always apply.

3. Discharge restrictions. It is prohibited to discharge any wastewater from on-site wastewater treatment and disposal systems (except under an NPDES permit) to any ditch, stream, pond, lake, natural or artificial waterway, county drain tile, surface water drain tile, land drain tile, or to the surface of the ground. Under no conditions shall effluent from on-site wastewater treatment and disposal systems be discharged to any abandoned well, agricultural drainage well, or sinkhole. Existing discharges to any of the above listed locations or structures shall be eliminated by constructing a system which is in compliance with the requirements of these rules.

4. Property transfer inspection.

   a. All on site waste water treatment and disposal systems in Bremer County shall be inspected and analyzed for compliance with this Ordinance and Chapter 69 of the Iowa Administrative Code 567, prior to or during any change in ownership of the land on which the system and/or building served is located. The property holder transferring the property or the transferor of the property shall obtain the inspection report from the Bremer County Board of Health and present it to the buyer or transferee of the property prior to, or during either the negotiation of the sale or the transfer of ownership.

   b. The inspection shall include unearthing, emptying, and inspection of the septic tank. In the event the septic tank is not in satisfactory condition, additional inspection of the secondary treatment system may be required. All costs shall be the responsibility of the property owner or transferor.

   c. If the original owner or transferor fails to have the property inspected as required, the buyer or transferee shall assume this responsibility along with any renovation costs.

   d. All on-site wastewater treatment and disposal systems not in compliance with the minimum standards set forth in this Ordinance and Iowa Administrative Code 567, Chapter 69, shall be updated at the time of sale or transfer.

   e. Any waste water treatment and disposal system which was installed under County permit, or passed County inspection within 5 years previous to sale or transfer, is exempt from further inspection until the next change of ownership provided pumping records are made available.

   f. Any renovation costs entailed with updating the system to minimum standards of this Ordinance and Iowa Administrative Code 567, Chapter 69, shall be the responsibility of the property owner or transferor.

g. An inspection fee shall be paid by the property owner or transferor after receipt of the inspection report. The inspection fee shall be set by the Bremer County Board of Supervisors by resolution of said board.

h. The administrative authority may contract with approved contractors to perform the inspections.

3-1-10 MINIMUM DISTANCES

All on-site wastewater treatment and disposal systems shall be located in accordance with the distances shown in Table 1.

TABLE 1

Minimum Distance in Feet From	Closed Portion of Treatment System (1)	Open Portion of Treatment System (2)
Private Water Supply Well	50	100
Public Water Supply Well	200	200
Groundwater Heat Pump Borehole	50	100
Lake or Reservoir	50	100
Stream or Pond	25	25
Edge of Drainage Ditch	10	10
Dwelling or Other Structure	10	10
Property Lines (unless a mutual easement is signed and recorded)	10	10
Other Types of Subsurface Treatment Systems	5	10
Water Lines Continually Under Pressure	10	10
Suction Water Lines	50	100
Foundation Drains or Subsurface Tiles	10	10

(1) Includes septic tanks, mechanical aeration tanks, and impervious vault toilets.

(2) Includes subsurface absorption systems, mound systems, intermittent sand filters, constructed wetlands, or waste stabilization ponds.

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3-1-11 SITE EVALUATION

A site evaluation shall be conducted prior to issuance of a construction permit. Consideration shall be given, but not limited to the impact of the following: topography, drainage ways, terraces, flood plain, percent of land slope, location of property lines, location of easements, buried utilities, existing and proposed tile lines, existing, proposed, and abandoned water wells, amount of available area for installation of the systems, evidence of unstable ground, and soil factors including percolation tests and soil survey maps if available.

3-1-12 BUILDING SEWERS

Location and construction. The types of construction and distances as shown in Table II shall be maintained for the protection of water supplies. The distances shall be considered minimum and increased where possible to provide better protection.

TABLE II

	Sewer Construction	Distance From Well Water Supply	
		Private	Public
A.	Schedule 40 plastic pipe (or SDR 26 or stronger) with approved type joints, or cast-iron soil pipe (extra heavy or centrifugally cast) with joints of performed gaskets.	10	25
B.	Sewer pipe installed to remain watertight and root-proof.	50	75

*Under no circumstances shall a well suction line pass under a building sewer line.

1. Requirements for Building Sewers

   a. Type Building sewers used to conduct wastewater from a building to the primary treatment unit of an on-site wastewater treatment and disposal system shall be constructed of Schedule 40 plastic pipe (or SDR 26 or stronger) with solvent-weld or bell-and-gasket type joints, or cast iron with integral bell-and-gasket type joints.

   b. Size Such building sewers shall not be less than4 inches in diameter.

   c. Grade Such building sewers shall be laid to the following minimum grades:

      4 - inch sewer..... 12 inches per 100 feet
      6 - inch sewer..... 8 inches per 100 feet

2. Clean outs

   a. Spacing A clean out shall be provided where the building sewer leaves the house and at least every 100 feet allowing rodding downstream.

   b. Change of Direction An accessible clean out shall be provided at each change in direction or grade, if the change exceeds 45 degrees.

3-1-13 SEPTIC TANKS

1. General Requirements

   a. Septic Tank Required Every on-site wastewater treatment and disposal system, except mechanical-aerobic systems, shall have as a primary treatment unit a septic tank as described in this rule. All wastewater from the facility shall discharge into the septic tank (except as noted in "d" below).

   b. Easements No septic tank shall be located upon property under ownership different from the ownership of that property or lot upon which the wastewater originates unless easements to that effect are legally recorded and approved by the proper administrative authority.

   c. Effluent Discharge Requirements All septic tank effluent shall discharge into a secondary treatment system in compliance with this rule or other system approved by the administrative authority according to Sec. 26.

   d. Prohibited Wastes Septic tanks shall not be used for the disposal of chemical wastes or grease in quantities which might be detrimental to the bacterial action in the tank, or for the disposal of the drainage from roof drains, foundation drains, or area drains.

2. Capacity

   a. Minimum Capacity Every septic tank shall have a minimum capacity below the water line as specified in the following table:

Cabins (seasonal use)	1000 gallons
1 bedroom homes	1000 gallons
2 or 3 bedroom homes	1250 gallons
4 or 5 bedroom homes	1500 gallons
6 bedroom homes	1750 gallons

   - 250 gallons of capacity shall be added to each of these tank volumes if a kitchen garbage disposal, water softener, or a high volume water fixture, such as a whirlpool bath is to be used.

   b. Other Domestic Waste Systems In the event that any installation serves more than a 6 bedroom home or its equivalent, or serves a facility other than a house and serves the equivalent of 15 persons or less (1,500 gal/day), approval of septic tank capacity and design must be obtained from the administrative authority. Minimum septic tank liquid holding volume shall be 2 times the estimated daily flow.

c. For wastewater flow rates for nonresidential and commercial domestic waste applications under 1,500 gal/day, refer to Appendix A.

d. Minimum Depth Minimum liquid holding depth in any compartment shall be 40 inches.

e. Maximum Depth Maximum liquid holding depth for calculating capacity of the tank shall not exceed 6½ feet.

3. Construction Details

a. Fill Soil Any septic tank placed in fill soil shall be placed upon a level, stable base that will not settle.

b. Compartmentation Every septic tank shall be divided into 2 compartments as follows (compartmentalization may be obtained by using more than one tank).

1. The capacity of the influent compartment shall not be less than one-half nor more than two-thirds of the total tank capacity.

2. The capacity of the effluent compartment shall not be less than one-third nor more than one-half of the total tank capacity.

c. Inlet/Outlet The invert of the inlet pipe shall be a minimum of 2 inches and a maximum of 4 inches higher than the invert of the outlet pipe.

d. Baffles 4-inch diameter schedule 40 plastic pipe tees shall be used as inlet and outlet baffles. Inlet tees shall extend at least 6 inches above and 8 inches below the liquid level of the tank. The inlet tee shall extend below the liquid level no more than 20% of the liquid depth. The outlet tee shall extend above the liquid level a distance of at least 6 inches and below the liquid level a distance of at least 10 inches but no more than 25% of the liquid depth. A minimum clearance between the top of the inlet and outlet tees and the bottom of the tank lid 2 inches shall be provided. A horizontal separation of at least 36 inches shall be provided between the inlet and the outlet baffle in each compartment. A horizontal slot 4inches by 6 inches, or 2 suitably spaced 4 inch diameter holes in the tank partition, may be used instead of a tee or baffle, the top of the slot or holes to be located below the water level a distance of one-third the liquid depth. A ventilation hole shall be provided in the partition, at least 8 inches above the level.

e. Access An access opening shall be brought up to the ground surface and shall be so located, with respect to the type of tank construction, that sludge and scum measurements may be readily made. An access opening shall be provided at each end of the tank over the inlet and outlet. These openings shall be at least 18 inches in smallest dimension if the tank has no other openings. Alternatively, a single opening at least 24 inches in diameter may be provided at the center of the tank allowing access to both compartments, with two smaller openings at least 6 inches in diameter over both inlet and outlet. If this alternative is used, the inlet and outlet openings need not be brought up to the surface.

f. Dimensions The interior length of a septic tank should not be less than 5 feet, and shall not be at least 1½ times the width(larger length-to-width ratios are preferred). No tank or compartment shall have an inside width of less than 2 feet. The minimum inside diameter of a vertical cylindrical septic tank shall be 5 feet.

4. Construction

a. Materials Tanks shall be constructed of poured concrete or plastic resistant to corrosion or decay and designed so that they will not collapse or rupture when subjected to anticipated earth and hydrostatic pressures when the tanks are either full or empty. Metal tanks are prohibited.

b. Dividers Tank dividers walls and divider wall supports shall be constructed of heavy, durable plastic, fiberglass, concrete, or other similar corrosion-resistant materials approved by the administrative authority.

c. Inlet and Outlet Ports Inlet and outlet ports of pipe shall be constructed of heavy, durable schedule 40 PVC plastic sanitary tees or other similar approved corrosion-resistant material.

d. Wall Thickness Minimum wall thickness for tanks shall conform to the Following specifications:

Poured Concrete	6 inches thick
Poured Concrete, reinforced	4 inches thick
Special Concrete mix, vibrated & reinforced	2.5 inches thick
Fiberglass or Plastic	0.25 inches thick

e. Concrete Specifications Concrete used in pre-cast septic tank construction shall have a maximum water-to-cement ratio of 0.45. Cement content shall be at least 650 pounds per cubic yard. Minimum compressive strength (f'c) shall be 4000 psi (28 Mpa) at 28 days of age. The use of ASTM C150 Type II cement or the addition of silica fume or Class F fly ash is recommended.

f. Tank Bottoms Septic tank bottoms shall conform to the specifications set forth for septic tank walls except special mix concrete shall be at least 3 inches thick.

g. Tank Tops Concrete or masonry septic tank tops shall be a minimum of 4 inches in thickness and reinforced with 3/8-inch reinforcing rods in a 6-inch grid or equivalent. Fiberglass or plastic tank tops shall be a minimum of 1/4 inch in thickness and shall have reinforcing and be of ribbed construction.

h. Reinforcing Steel Placement The concrete cover for the reinforcing bars, mats, or fabric shall not be less than 1 inch.

i. Bedding Fiberglass or plastic tanks shall be bedded according to manufacturer's specifications. Provisions shall be made to prevent flotation when the tanks are empty.

j. Coating All concrete surfaces in septic tanks shall be sealed for water tightness with a protective coating of bituminous materials.

5. Connecting Pipes

a. Minimum Diameter The pipes connecting septic tanks installed in series and at least the first 5 feet on the effluent side of the last tank shall be a minimum of 4 inch diameter schedule 40 plastic.

b. Tank Connections All inlet and outlet connections at the septic tanks shall be made by self-sealing gaskets cast into the concrete or formed into the plastic or fiberglass.

c. Joints All joints in connecting schedule 40 plastic pipe shall be approved plastic pipe connections such as solvent welded or compression-type gaskets.

d. Pipes in Unstable Ground Schedule 40 plastic pipe shall be used extending across excavations or unstable ground to at least 2 feet beyond the point where the original ground has not been disturbed in septic tank installations. If the excavation spanned is more than 2 feet, it must be filled with and or compacted fill to provide a firm bed for the pipe. The first 12 inches of back fill over the pipe shall be applied in thin layers using material free from stones, boulders, large frozen chunks of earth, or any similar material that would damage or break the pipe.

3-1-14 SUBSURFACE ABSORPTION SYSTEMS

1. General Requirements

   a. Locations All subsurface absorption systems shall be located on the property to maximize the vertical separation distance from the bottom of the absorption trench to the seasonal high groundwater level, bedrock, hardpan, or other confining layer. However under no circumstances shall this vertical separation be less than 3 feet.

   b. Soil Survey Reports During a site analysis and investigation, maximum use should be made of soil survey reports, which are available from the USDA Soil Conservation Service. An identification of the percolation can be made from the soil map units in Iowa by scientists representing the multi-agencies contributing to the Iowa cooperative soil survey program.

   c. Percolation Test The percolation test procedure is outlined in Appendix B.

   d. Prohibited Drainage Roof, foundation, and storm drains shall not discharge into or upon subsurface absorption systems.

   e. Prohibited Construction There shall be no construction of any kind, including driveways, covering the septic tank, distribution box, or the absorption field of an on-site wastewater treatment and disposal system. Vehicle access should be infrequent, primarily limited to vegetation maintenance.

   f. Driveway Crossings Connecting lines under driveways shall be constructed of schedule 40 plastic pipe, or equivalent, and protected from freezing.

   g. Easements No wastewater shall be discharged upon any property under ownership different from the ownership of the property or lot upon which it originates, unless easements to that effect are legally recorded and approved by the administrative authority.

   h. Groundwater If groundwater is present within 3 feet of the final grade, the area shall be classified as unsuitable for the installation of a subsurface absorption system. Consult the administrative authority for an acceptable alternative method of wastewater treatment.

   i. Site Limitations In situations where specific location or site characteristics would appear to prohibit normal installation of an on-site wastewater treatment and disposal system, design modifications may be approved by the administrative authority which could overcome such

limitations. Examples of such limitations could be the installation of subsurface drainage, use of shallow or at-grade trenches, use of dual soil treatment areas, mound systems, or water conservation plans.

2. Trench Length Requirements

a. Percolation Charts Table IIIa specifies lineal feet of lateral trenches required in accordance with the results of the standard percolation tests. Tables IIIb and IIIc list optional methods for determining the length of lateral trenches, or sizing of absorption beds. The alternative option for increased rock usage (Table IIIb) shall be used only when the size of the lot limits the use of trench lengths prescribed in Table IIIa. Absorption beds (Table IIIc) shall not be used except when the lot size limitations preclude the installation of a lateral trench system. Further details concerning limitations of these 2 alternatives should be obtained from the administrative authority prior to requesting authorization for installation.

b. Unsuitable Absorption Conventional subsurface soil absorption trenches shall notbe installed in soils that have a percolation rates less than 1 minute per inch or greater than 60 minutes per inch. Plans for an alternative method of wastewater treatment shall be submitted to the administrative authority for approval prior to construction.

TABLE IIIa
Soil Absorption System Sizing Chart
(Lineal Feet of Absorption Trench)

Min. Per Inch	2 Bedroom 300 gal/day (1)	3 Bedroom 450 gal/day	4 Bedroom 600 gal/day	5 Bedroom 750 gal/day	6 Bedroom 900 gal/day
1-5	160	200	260	340	400
6-15	200	300	400	500	600
16-30	300	400	500	600	700
31-45	400	500	600	800	900
46-60	500	600	700	900	1100

(1) For domestic, non-household wastewater flow rates refer to Appendix A.

TABLE IIIb
Alternative Option for Increased Rock Usage
(Only if Necessary)

Depth of Gravel (1) below Distribution Line	Reduction in Trench Lengths as Taken from Table IIIa
12"	20%
18"	33%
24"	40%

(1) Total depth of trench must not exceed 36". Soil profile must be consistent with the percolation rate throughout the depth used. Separation from groundwater and confining layers must be maintained.

TABLE IIIc
Alternative Option for Use of Absorption Bed (1)

Percolation Rate Min./Inch	Absorption Area/Bedroom Sq. Ft.	Loading Rate/Day Gal./Sq. Ft.
1-5	300	.5
6-15	400	.375
16-30	600	.25

(1) Absorption beds may only be used when site space restrictions require and shall not be used when the soil percolation rate exceeds 30 min./inch.

3. Construction Details

a. Depth Lateral trenches shall not exceed 36 inches in depth, unless authorized by the administrative authority, but a more shallow trench bottom depth of 18 to 24 inches is recommended. Not less than 6 inches of porous soil shall be provided over the laterals. Minimum separation between trench bottom and groundwater, rock formation, or other confining layers shall be 36 inches even if extra rock is used under the pipe.

b. Length No lateral absorption trench shall be greater than 100 feet in length. Soil absorption trenches are required to be of equal lengths.

c. Separation Distance At least 6 feet of undisturbed soil shall be left between each trench edge on level sites. The steeper the slope of the ground, the greater the separation distance should be. 2 feet of separation distance should be added for each 5% increase in slope from the level.

d. Grade Trench bottom should be constructed level from end to end. On sloping ground, the trench shall follow a uniform land contour to maintain a minimum soil cover of 6 inches, while ensuring a level trench bottom.

e. Compaction There shall be a minimum use or traffic of heavy equipment on the area proposed for soil absorption. In addition, it is prohibited to use heavy equipment on the bottom of the trenches in the absorption area.

f. Fill Soil absorption systems shall not be installed in fill soil. Disturbed soils, which have stabilized for at least one year would require a recent percolation test.

g. Bearing Strength Soil Absorption systems shall be designed to carry loadings to meet AASHTO H-10 standards.

h. Soil Smearing Soils with significant clay content should not be worked when wet. If soil moisture causes side wall smearing, the trench bottom and side walls shall be scarified.

4. Gravel Systems

a. Gravel A minimum of 6 inches of clean, washed river gravel, free of clay and clay coatings, shall be laid below the distribution pipe, and enough gravel shall be used to cover the pipe. This gravel shall be of such size that 100% will pass a 2½ inch screen and 100% will be retained on a ¾ inch screen. Limestone or crushed rock is not recommended for soil absorption systems. If used it shall meet the following criteria:

(1) A brasion The percent wear, as determined in accordance with the AASHTO T 96, Grading C, shall not exceed 40%.

(2) Freeze and Thaw Loss When subjected to freezing and thawing test, Iowa DOT Materials Laboratory Test Method 211, Method A, the percent loss shall not exceed 10%.

(3) Absorption The percent absorption, determined in accordance with Iowa DOT Materials Laboratory Test Method 202, shall not exceed 3%.

(4) Gradation The aggregate shall have not more than 1.5% by weight pass a #16 sieve.

b. Trench Width Lateral trenches for gravel systems shall be a minimum of 24 inches, and a maximum of 36 inches in width at the bottom of the trench.

c. Grade The distribution pipes shall be laid with a minimum grade of 2 inches per 100 feet of run, and a maximum grade of 6 inches per 100 feet of run, preference given to the lesser slope.

d. Pipe Distribution pipe shall be PVC rigid plastic meeting ASTM Standard 2729, diameter shall be less than 4 inches, with perforations at least ½ inch and no more than ¾ inch in diameter, spaced no more than 40 inches apart. Two rows of perforations shall be provided located 120 degrees apart along the bottom half of the tubing(each 60 degrees up from the bottom centerline). The end of the pipe in each trench shall be sealed with a watertight cap unless, on a level site, a footer is installed connecting the trenches together. Coiled perforated plastic pipe shall not be used when installing absorption systems.

e. Gravel Cover Unbacked, rolled, 3½ inch thick fiberglass insulation, untreated building paper, synthetic drainage fabric, or other approved material shall be laid so as to separate the gravel from the soil backfill.

5. Chamber System

a. Application Chamber systems may be used as an alternative to 4 inch pipe placed in gravel filled trenches. However, they cannot be used in areas where conventional systems would not be allowed due to poor permeability, high ground water, or insufficient depth to bedrock.

b. Installation Manufacturer's specifications and installation procedures shall be closely adhered to.

c. Length of Trench The total length of absorption trench for chambers 24 inches or less in bottom width shall be the same as given in Table IIIa. For chambers greater than 33 inches in width, a reduction of 25% from the length in Table IIIa may be taken.

d. Sidewall The chambers shall have at least 6 inches of sidewall effluent soil exposure height.

6. Gravelless Pipe Systems

a. Gravelless subsurface absorption systems are not allowed.

7. Gravity Distribution

a. Dosing is always recommended and preferred to improve distribution, improve treatment, and extend the life of the system.

b. On a hillside, septic tank effluent may be serially loaded to the soil absorption trenches by drop boxes or overflow piping(rigid sewer pipe). Otherwise, effluent shall be distributed evenly to all trenches by use of a distribution box or commercial distribution regulator approved by the administrative authority.

c. Design When a distribution box is used, it shall be of proper design and installed with separate watertight headers leading from the distribution box to each lateral. Header pipes shall be rigid PVC plastic pipe meeting ASTM Standard 2729 or equivalent.

d. Outlet Heights The distribution box shall have outlets at the same level at least 4 inches above the bottom of the box to provide a minimum of 4 inches of water retention in the box.

e. Baffles There shall be a pipe tee or baffle at the inlet to break the water flow.

f. Unused Outlets All unused outlet holes in the box shall be securely closed.

g. Interior Coating All distribution boxes shall be constructed of corrosive resistant rigid plastic materials, or other corrosion resistant material approved by the administrative authority.

h. Outlet Levels All outlets of the distribution box shall be made level. A 4-inch cap with an offset hole approximately 2½ inches in diameter shall be installed on each outlet pipe. These caps shall be rotated until all outlets discharge at the same elevation.

i. Equal Length Required The soil absorption area served by each outlet of the distribution box shall be equal.

8. Dosing Systems

a. Pump Systems

(1) Pump and Pit Requirements In the event the effluent from the septic tank outlet cannot be discharged by gravity and still maintain proper lateral depths, the effluent shall discharge into a watertight vented pump pit with an inside diameter of not less than 24 inches, equipped with a tight-fitting manhole cover at grade level. The sump vent shall extend a minimum of 6 inches above grade level and shall be a minimum of 1¼ inches fitted with a return bend. The pump shall be of a submersible type of corrosion resistant material.

(2) Pump Settings The pump shall be installed in the pump pit in a manner that ensures ease of service and protection from frost and settled sludge. The pump shall be set to provide a dosing frequency of approximately twice a day based on the maximum design flow. No on-site electrical connections shall be made in the pump pit. These connections shall be made in an exterior weatherproof box.

(3) Pressure Line Size The Pressure line from the pump to the point of discharge shall not be smaller than the outlets of the pump it serves.

(4) Drainage Pressure lines shall be installed to provide total drainage between dosing to prevent freezing or be buried below frost level up to the distribution box.

(5) High Water Alarm Pump pits shall be equipped with a sensor set to detect if the water level rises above the design high water level when the pump fails. This sensor shall activate an auditory or visual alarm to alert the homeowner when repairs are required.

(6) Discharge Point The effluent shall discharge under pressure into a distribution box or may be distributed by small diameter pipes through the entire absorption field.

b. Dosing Siphons Dosing siphons may also be used. Manufacturer's specifications shall be adhered to for installation. Similar dosing volumes and frequencies are recommended. Dosing siphons require periodic cleaning to ensure their continued proper operation.

3-1-15 MOUND SYSTEM

1. General Requirements

a. Mound systems shall be permitted only after a through site evaluation has been made and landscaping, dwelling placement, effect on surface drainage, and general topography have been considered.

b. Mound systems shall not be utilized on sites, which are subject to flooding with a 10-year or greater frequency.

c. Mound systems shall not be utilized on soils where the high ground water level, impermeable bedrock, or soil strata having a percolation rate exceeding 120 minutes per inch occur within 12 inches of natural grade, or where crevice bedrock occurs within 20 inches of natural grade.

d. Mound systems shall be constructed only upon undisturbed naturally occurring soils.

e. Mound systems shall be located in accordance with the distance specified in Table I as measured from the outer edge of the mound.

f. No building, driveways, or other surface or subsurface obstructions shall be permitted within 50 feet on the down gradient side of the mound when the mound is constructed on a slope greater than 5%. No further construction shall be permitted in this effluent disposal area as long as the mound is in use.

g. Specifications given in these rules for mounds are minimal and may not be sufficient for all applications. Technical specifications are changing with experience and research. Other designs information beyond the scope of these rules may be necessary to properly design a mound system.

2. Materials for Mound Fill

a. The mound shall be constructed using clean, medium-textured sand, sometimes referred to as concrete sand. The sand size shall be such that at lest 25% by weight shall have a diameter between 2.0 and 0.25 mm, less than 35% with a diameter between 0.25 and 0.05 mm and less than5 % with a diameter between 0.002 and 0.05 mm.

b. Rock fragments larger than 1/16 inch (2.0mm) shall not exceed 15% by weight of the material used for sandy fill.

3. Construction Details

a. There Shall be a minimum of 3 feet of fill material and undistributed naturally occurring soils between the bottom of the washed gravel and the highest elevation of the limiting conditions defined in the general requirements part c.

b. Gravel shall be washed and shall range in size from ¾ inch to 2½ inches

c. From 1 to 2 feet of medium textured sand(depending upon the underlying soil depth, construction details part a) must be placed between the bottom of the gravel and the top of the plowed surface of the naturally occurring soil.

d. Mound systems shall utilize absorption bed distribution piping design. The bed shall be installed with the long dimension parallel to the land contour. Systems on steep slopes with slowly permeable soils should be narrow to reduce the possibility of toe seepage.

e. Minimum spacing between distribution pipes shall be 4 feet, and a minimum of 3 feet shall be maintained between any trench and the side wall of the mound.

f. No soil under or up to 50 feet down gradient of the mound may be removed or disturbed except as specified herein.

g. Construction equipment which could cause undesirable compaction of the soil shall be kept off the base area. Construction or plowing shall not be initiated when the soil moisture content is high. If a sample of soil from approximately 9 inches below the surface can be easily rolled into a 1/8 to 1/4 inch diameter wire, the soil moisture content is too high for construction purposes.

h. Above ground vegetation shall be closely cut and removed from the ground surface throughout the area to be utilized for the placement of the fill material.

i. The area shall be plowed to a depth of 7 to 8 inches, parallel to the land contour, with the plow throwing the soil up slope to provide interface between the fill and the natural soil. Tree stumps should be cut flush with the surface of the ground, and roots should not be pulled.

j. The base area of the mound is to be calculated on the results of percolation rate as indicated in Table IV. The base area of the mound below and down slope from the trenches, excluding the area under the end slopes, must be large enough for the natural soil to absorb the estimated daily wastewater flow.

TABLE IV

Percolation Rate Min/ Inch	Application Rate Gal/Square Foot/Day
Less than 1	Not suitable
1-5	1.25
6-15	1.00
16-30	.75
31-45	.50
46-60	.40
61-90	.20
91-120	.10
Over 120	Not suitable

k. The area of the fill material shall be sufficient to extend 3 feet beyond the edge of the gravel area before the sides are shaped to at least a 4:1 slope (preferable 5:1).

l. Distribution System

(1) The distribution pipe shall be rigid plastic pipe, schedule 40 or 80 with 1 inchnominal diameter.

(2) The distribution pipe shall be provided with a single row of ¼ inch perforations in a straight line 30 inches on center along the length of the pipe or an equivalent design that ensures uniform distribution. All joints and connections shall be solvent cemented.

(3) The distribution pipe shall be placed in the clean, washed gravel(or crushed limestone) with holes downward. The gravel shall be a minimum of 9 inches in depth below and 3 inches in depth above the pipe.

(4) No perforations shall be permitted within 3 inches of the outer ends of any distribution pipes.

(5) The outer ends of all pressure distribution lines shall be securely capped.

(6) The central pressure manifold should consist of 1½ or 2 inch solid plastic pipe using a tee or cross for connecting the distribution lines.

m. Construction should be initiated immediately after preparation of the soil interface by placing all of the sandy fill material needed for the mound(to the top of the trench) to a minimum depth of 21 inches above the plowed surface. This depth will permit excavation of the trenches to accommodate the 9 inches of washed gravel or crushed stone necessary for the distribution piping.

n. The absorption trench or trenches shall be hand excavated to a depth of 9 inches, the bottoms of the trenches made certain to be level.

o. 12 inches of gravel shall be placed in the trench and hand leveled, and than 3 inches of the gravel removed with a shovel in the location where the distribution pipe will be placed. After the distribution pipe is placed the pipe shall be covered with 2 inches of gravel.

p. The top of the gravel shall be covered with synthetic drainage fabric. Unbacked, rolled 3½ inch thick fiberglass insulation, untreated building paper, or other suitable material may be used with the approval of he administrative authority. Plastic or treated building paper shall not be used.

q. After installation of the distribution system, gravel and material over the gravel, the entire mound is to be covered with topsoil native to the site or of familiarly characteristics to support vegetation in the area. The entire mound

shall be crowned by providing 12 inches of topsoil on the sides slopes with a minimum of 18 inches over the center of the mound. The entire mound shall be seeded, sodded, or otherwise provided with a grass cover to ensure stability of the installation.

r. The area surrounding the mound shall be graded to provide for diversion of surface runoff water.

4. Dosing

a. Dosing shall be required for mound systems.

b. The dosing volume shall be 5 to 10 times the distribution piping network volume.

c. The size of the dosing pump or siphon shall be capable of maintaining an approximate pressure of one psi at the outer ends of the distribution lines.

3-1-16 DRIP IRRIGATION

1. General Requirements

a. Pretreatment Required These systems must be preceded by a secondary treatment system discharging a treated, filtered effluent with BOD and TSS values less than 20 mg/l.

b. Separation from Groundwater Drip irrigation systems shall have a minimum vertical separation distance to high groundwater level or bedrock of 20 inches.

c. Maximum Hillside Slope Drip irrigation systems shall not be installed on slopes of more than 25%.

d. Specifications given in these rules for drip irrigation are minimal and may not be sufficient for all applications. Technical specifications are changing with experience and research. Other design information beyond the scope of these rules may be necessary to properly design a drip irrigation systems.

2. Emitter Layout

a. Discharge Rate Systems shall be designed so that emitters discharge approximately 1 gpd at 12 psi, or other rates suggested by the manufacturer and approved by the administrative authority.

b. Grid size Drip lines shall be run in parallel lines 2 feet apart. emitters shall be placed in the drip lines on 2 foot intervals with emitters 1 foot between adjacent lines. Each emitter shall cover 4 square feet of absorption area.

c. Field Size The field shall be sized according to the application rate given in Table V.

d. Depth of Drip Lines Drip lines shall be laid on the contour 6 to 12 inches deep with a maximum line length of 100 feet. Lines may be of unequal length.

e. Interconnection Drip lines shall all be connected to supply and return headers such that the entire system will automatically drain back to the dosing tank or pump pit upon completion of the pumping cycle. Vacuum breakers shall be positioned at the high point of the supply and return headers. The dosing tank shall have a high water audio/visual alarm.

Table V Length of Drip Line Required Per Bedroom

Perc. Rate min./in.	Design Hyd. Loading gpd/sq. ft.	Length of Drip Line feet/ bedroom
1-5	2.0	40
6-15	1.3	60
16-30	0.9	90
31-45	0.6	150
46-60	0.4	200
61-90	0.2	400
91-120	0.1	800

3-1-17 INDIVIDUAL MECHANICAL AEROBIC WASTEWATER TREATMENT SYSTEMS

1. General Requirements

a. Use Mechanical/aerobic systems may be used only when the administrative authority determines that the site is unacceptable for a full sized soil absorption system. Because of the higher maintenance requirements of mechanical/aerobic systems, preference should be given to sand filters, where conditions allow.

b. Certification All Individual mechanical aerobic wastewater treatment plants shall be certified by an ANSI accredited third party certified to meet National Sanitation Foundation Standard 40, Class I, including appendices(May 1996)

c. Installation and Operation All Individual mechanical aerobic wastewater treatment plants shall be installed, operated, and maintained in accordance with the manufacturer's instructions and the requirements of the administrative authority. The aerobic plants shall have a minimum treatment capacity of 150 gallons per bedroom per day or 500 gallons, whichever is greater.

d. Effluent Treatment The effluent from individual mechanical aerobic wastewater treatment plants shall receive additional treatment through the use of intermittent sand filters, mound systems, or subsurface absorption systems of a magnitude of half that prescribed in these rules, or by discharge to a drip irrigation system.

e. Maintenance Contract A maintenance contract with a manufacturer certified technician shall be maintained at all times. Maintenance agreements and responsibility waivers shall be recorded with the county recorder and in the abstract of title for the premises on which mechanical aerobic treatment systems are installed. Mechanical aerobic units shall be inspected for proper operation at least twice a year on 6 month intervals.

g. Effluent Sampling Any open discharge from systems involving mechanical aeration shall have the effluent sampled at each inspection. Test shall be run for CBOD5, TSS and Coliform bacteria.

3-1-18 INTERMITTENT SAND FILTERS

1. General Requirements

a. Use Intermittent sand filters may be used when the administrative authority determines the site is unacceptable for a full-sized soil absorption system.

b. Location Intermittent sand filters shall be located in accordance with the distances specified in Table I.

c. Sampling A sampling port shall be available at the discharge point of the filter or shall be installed in the discharge line. Monitoring and effluent sampling of intermittent sand filters must meet the requirements of the NPDS permit.(As specified in Sec 6.) Such sampling shall be performed annually or as directed by the administrative authority. The maximum carbonaceous BOD5, total suspended solids, and fecal coliform count requirements are as follows:(fecal test shall only be required where waste discharged is into a watershed within 1 mile upstream of a class A water)

Effluents Discharging To	Fecal Coliform/100 ml	CBOD5	TSS
Class "A" water:			
Primary contact water use*	200	25	25
All other water use classifications	no limit	25	25

* A separation distance of 750 feet shall be maintained between any point of discharge and a primary recreational area as specified in the "Recommended Standards for Bathing Beaches" of the Great Lakes-Upper Mississippi River Board of State Public Health and Environmental Managers.

d. Prohibited Construction There shall be no construction, such as buildings or concrete driveways, covering any part of an intermittent sand filter.

2. Construction

a. Number An intermittent sand filter shall consist of one filtering bed or two or more filtering beds connected in series and separated by a minimum of 6 feet of undisturbed earth.

b. Pipelines Each bed shall contain a horizontal set of collector lines. The collector lines shall be equivalent to SDR 35 PVC pipe, 8 inch diameter Gravelless drainpipe or other suitable materials.

(1) 1 collector line shall provided for each 6 feet of width or fraction thereof. A minimum of 2 collector lines shall be provided.

(2) The collector lines shall be laid to a grade of 1 inch in 10 feet(or 0.5% to1.0%)

(3) Each collector line shall be vented or connected to a common vent. Vents shall extend at least 12 inches above the ground surface with the outlet screened, or provided with a perforated cap.

(4) Gravelless drainfield pipe with fiber wrap may be used for collector lines. If so, no gravel or pea gravel is required covering the collector lines. The pipe shall be bedded in filter sand.

(5) If 4 inch plastic pipe with perforations is used for the collector lines, they shall be covered as follows:

1. Gravel ¾ to 2½ inches in size shall be placed around and over the lower collector lines until there is a minimum of 4 inches of gravel over the pipes.

2. The gravel shall be overlain with a minimum of 3 inches of washed pea gravel 1/8 to 3/8 inch size interfacing with the filter media. A layer of fabric filter may be used in place of the pea gravel. Fabric filters must be 30 by 50 mesh with a percolation rate of at least 5 gal./sq. ft.

(6) A minimum of 24 inches of coarse washed sand shall be placed over the pea gravel or above the gravelless drain field pipe. The sand shall meet the Iowa DOT standards for concrete sand: 100% shall pass a 9.5 mm screen, 90% to 100% shall pass a 4.75 mm screen, 70% to 9.5 100% shall pass a 2.36 mm screen, 10% to 60% shall a 600µm screen, and 0% to 1.5% shall pass a 75µm screen.

3. Subsurface Sand Filters

a. Distribution System and Cover

(1) Gravel Base 6 inches of gravel ¾ inch to 2½ inches in size shall be placed upon the sand in the bed.

(2) Distribution lines Distribution lines shall be level and shall be horizontally spaced a maximum of 3 feet apart, center to center. Distribution lines shall be rigid perforated PVC pipe.

(3) Venting. Venting shall be placed on the downstream end of the distribution lines with each distribution line being vented or connected to a common vent. Vents shall extend at least 12 inches above the ground surface with outlet screened, or provided with a perforated cap.

(4) Gravel Cover Enough gravel shall be carefully placed to cover the distributors.

(5) Separation Layer A layer of material such as unbacked, rolled 3½ inch thick fiberglass insulation, untreated building paper of 40 to 60 pound weight, synthetic drainage fabric or 4 to 6 inches of marsh hay or straw shall be placed upon the top of the upper layer of gravel.

(6) Soil Cover A minimum of 12 inches of soil back fill shall be provided over the beds.

(7) Distribution Boxes A distribution box shall be provided for each filter bed gravity distribution is used. The distribution boxes shall be placed upon undisturbed earth outside the filter bed. Separate water tight lines shall be provided leading from the distribution boxes to each of the distribution lines in the beds.

b. Sizing of Subsurface Sand Filters

(1) Gravity Flow

1. For residential systems, single bed subsurface sand filters shall be sized at a rate of 240 square feet of subsurface area per bedroom.

2. Dual subsurface sand filters, constructed in series, shall be sized at the rate of 160 square feet of surface area per bedroom in the first filter and 80 square feet of surface area per bedroom in the second filter in the series.

(2) Pressure Dosed

1. For residential systems, single bed subsurface sand filters dosed by a pump or dosing siphon may be sized at a rate of 180 square feet of surface area per bedroom.

2. Dual subsurface sand filters, constructed in series, may be sized at the rate of 120 square feet of surface area per bedroom in the first filter and 60 square feet of surface area per bedroom in the second filter in series.

(3) Non-Household Effluent application rates for commercial systems treating domestic waste shall not exceed the following:

1. 1.5 gallon/square feet/day for double bed sand filters.

2. 1.0 gallon/square feet/day for single bed sand filters.

3. Total surface area for any subsurface sand filter system shall not be less than 200 square feet.

4. Free Access Sand Filters

a. Description Media characteristics and under drain systems for free access filters are similar to those for subsurface sand filters. Dosing of the filter should provide for flooding the bed to a depth of approximately 2 inches. Dosing frequency is usually greater than 2 times per day. For coarser media (greater than 5.0mm) a dosing frequency greater than 4 times per day is desirable. Higher acceptable loadings on these filters as compared to subsurface filters relate primary to the accessibility of the filter surface for maintenance. Gravel is not used on top of the sand media, and the distribution pipes are exposed above the surface.

b. Distribution. Distribution to the filter may be by means of troughs laid on the surface, pipelines discharging to splash plates located at the center or corners of the filter, or spray distributors. Care must be taken to ensure that lines discharging directly to the filter surface do not erode the sand surface. The use of curbs around the splash plates or large stone placed around the periphery of the plates will reduce the scour. A layer of washed pea gravel placed over the filter media may also be employed to avoid surface erosion. This practice will create maintenance difficulties, however, when it is time to rake or remove a portion of the media surface.

c. Covers Free access filters may be covered to protect against severe weather conditions and to avoid encroachment of weeds or animals. The cover also serves to reduce odor conditions. Covers may be constructed of treated wooden plank, galvanized metal, or other suitable material. Screens or hardware cloth mounted on wooden frames may also serve to protect filter surfaces. Where weather condition dictate, covers should be insulated. A space of 12 to 24 inches should be allowed between the insulated cover and sand surface. Free access filters may not be buried by soil or sod.

d. Loading The hydraulic loading free access sand filters should be from 2.0 to 5.0 gpd/sq. ft.

e. Number of Filters Dual filters each sized for the design flow are recommended for loading rates in excess of 3½ gpd/sq.ft. treating septic tank effluent.

5. Dosing. *Dosing for sand filters is strongly advised. Without dosing, the entire area of the sand filter is never effectively used. Dosing not only improves treatment effectiveness, but also decreases the chance of premature failure.

a. Pumps A pump shall be installed when adequate elevation is not available for the system to operate by gravity.

(1) The pump shall be of corrosion-resistant material.

(2) The pump shall be installed in a water tight pit.

(3) The dosing system shall be designed to flood the entire filter during the dosing cycle. A dosing frequency of greater than 2 times per day is recommended.

(4) A high water alarm shall be installed.

b. Dosing Siphons When a dosing siphon is used where elevations permit, such siphon shall be installed as follows:

(1) Dosing Siphons shall be installed between the septic tank and the first filter bed.

(2) Dosing siphons shall be installed with strict adherence to the manufacturer's instructions.

c. Dosing Tanks The dosing tank shall be of such size that the siphon will flood the entire filter during the dosing cycle. A dosing frequency of greater than 2 times per day is recommended.

3-1-19 CONSTRUCTED WETLANDS

1. General Site Design

a. Application Constructed wetlands shall only be used where soil percolation rates at the site exceed 120 minutes per inch. Because of the higher maintenance requirements of constructed wetland systems, preference should be given to sand filters, where conditions allow.

b. Effluent Treatment The effluent sampling of constructed wetland shall receive additional treatment through the use of intermittent sand filters of magnitude of alf that prescribed in Sec. 18.

c. Effluent Sampling The effluent sampling of constructed wetlands shall be performed twice a year or as directed by the administrative authority. Test shall be run on all parameters as required. (Sec. 6)

d. Specifications given in these rules for constructed wetlands are minimal and may not be sufficient for all applications. Technical specifications are changing with experience and research. Other design information beyond the scope of these rules may be necessary to properly design a constructed wetland system.

2. Wetland Design

a. Depth The wetland shall be of a subsurface flow construction with a rock depth of 18 inches and a liquid depth of 12 inches.

b. Materials Substrate shall be washed river gravel with a diameter of ¾ inch to 2½ inches. If crushed quarried stone is used, it must meet the criteria listed in 3-1-14 4, part a.

c. Sizing and Configuration Detention time shall be a minimum of 7 days.

(1) Dimensions This may be accomplished with trenches 16 to 18 inches deep(12 inches of liquid), 3 feet wide with 100 feet of length per bedroom. This may also be done with beds 16 to 18 inches deep with at least 300 square feet of surface area per bedroom. The bottom of each trench or bed must be level within ± ½ inch.

(2) Configuration Multiple trenches or beds in series should be used. Beds or trenches in series may be stepped down in elevation to fit a hillside application. If the systems is on one elevation, it should still be divided into units by earthen berms at about 50% to 75% of the total length.

(3) Unit Connections Each submit shall be connected to the next with an over-flow pipe(rigid sewer pipe) that maintains the water level in the first section. Protection from freezing may be necessary.

d. Liner Wetlands shall be lined with synthetic PVC or PE plastic liner 20 to 30 mils thick.

e. Inlet Pipe Effluent shall enter the wetland by a 4 inch pipe sealed into the liner. With beds, a header pipe shall be installed along the inlet side to distribute the waste.

f. Protective Berms Wetland systems sites shall be bermed to prevent surface water from entering the trenches or beds.

3. Vegetation

a. Setting Plants Vegetation shall be established on the wetlands at time of construction. 12 inches of rock is placed in each unit, the plants are set, than the final 4 to 6 inches of rock is placed.

b. Plant Species Only indigenous plant species shall be used, preferably collected within a 100 mile radius of the site. Multiple species in each system are recommended. Preferred species include, but are not limited to:

(1) Typha Latifola - Common Cattail
(2) Typha Angustifolia - Narrow Leaf Cattail
(3) Scirpus spp. - Bullrush
(4) Phragmites communis - Reed

c. Plant Establishment Transplant is the recommended method of vegetation establishment. For transplanting, the propagule should be transplanted, at a minimum, on a 2 foot grid. The transplants should be fertilized, preferably with a controlled release fertilizer such as Osmocote 18-5-11 for all fall and winter planting, 18-6-12 for spring planting, and 19-6-12 for summer planting. Trenches or beds should be filled with fresh water immediately.

d. Plant Management In the late fall the vegetation shall be mown and the detritus left on the wetland surface as a temperature mulch. In the early spring the mulch shall be removed and disposed of to allow for adequate bed aeration.

3-1-20 WASTE STABILIZATION PONDS

1. General Requirements

a. Waste stabilization ponds may be used if designed and constructed in accordance with the following criteria and provided the effluent is discharged in accordance with the requirements of general NPDES permit listed in rule Sec. 6. A septic tank sized according to Sec 13 shall precede the waste stabilization pond.

2. Location

*Waste stabilization ponds must meet the following separation distances:

a. 1,000 feet from the nearest inhabitable residence, commercial building, or other the owner of the proposed treatment facility, or there is written agreement with the owner of the building, this separation criterion shall not apply. Any such written agreement shall be filed with the county recorder and recorded for abstract of title purposes, and a copy submitted to the department.

b. 1,000 feet from public shallow wells.

c. 400 feet from public deep wells.

d. 400 feet from private wells.

e. 400 feet from lakes and public impoundment's.

f. 25 feet from property lines and right-of-way.

3. Size

   a. Dimensions Ponds shall have a length not exceeding 3 times the width.

   b. Capacity When domestic sewage from a septic tank is to be discharged to a waste stabilization pond, the capacity of the pond shall be equivalent to 180 times the average daily design flow.

   c. Depth The wastewater depth for a waste stabilization pond shall be uniform and 3 to 5 feet.

   d. Freeboard A minimum of 2 feet shall be maintained at all times.

4. Embankments

   a. Seal Embankments shall be constructed of impermeable materials and shall be compacted. The bottom of the waste stabilization pond shall be cleared and leveled to the required elevation and shall be lined with an impermeable natural or man-made material. Seepage loss through the sides and bottom shall be less than 1/16 inch per day.

   b. Slope Inside embankment slopes shall be 3 horizontal to 1 vertical. Outside embankments shall be at least 3:1.
   c. Berm Top Berm tops shall be at least 4 feet wide.

   d. Cover Embankments shall be seeded from the outside toe to the inside high water line. From the high water line down the embankment diagonally about 5 feet shall be rip-rapped for erosion and vegetation control.

5. Inlet and Outlet Structures

   a. Inlet The inlet shall be placed no higher than 12 inches above the bottom of the pond. It shall discharge near the middles of the pond at a point opposite the overflow structure and onto a concrete splash plate a least 2 feet square.

   b. Outlets The outlet pipe shall withdraw water from a submerged depth of at least 1 foot. The intake for the outlet pipe shall be 3 to 5 feet from the embankment.

   c. Separation The inlet and outlet should be separated to the maximum extent possible, ideally by a berm or baffle constructed in the lagoon to prevent short-circuiting.

6. Drainage

   a. All surface water shall be diverted away from the waste stabilization pond.

7. Discharge

   a. Controlled Discharge If the pond is designed for open discharge, it must be discharged under controlled conditions. The effluent must be tested before 25 mg/l of TSS. Another test must be taken during discharge with the same results. Pond discharge is permitted only in spring and fall when stream flows are highest.

   b. Continuous Discharge If the pond is to have an unlimited continuous discharge, the effluent shall receive additional treatment through the use of intermittent sand filters, mound systems, or subsurface absorption systems of a magnitude of half that prescribed in Sec. 14, Sec. 15, and Sec. 17. Under continuous discharge, effluent sampling shall be as required for constructed wetlands as outlined in Sec. 19 section 1 part c.

8. Maintenance

   a. Fencing All waste stabilization ponds are to be fenced adequately to prevent entrance of livestock, and to discourage entrance by people into the area. Signs shall be posted warning of possible health and safety hazards.

   b. Vegetation. Vegetation on the top and sides of the berm shall be kept mown. No trees shall be allowed to become established.

3-1-21 REQUIREMENTS FOR IMPERVIOUS VAULT TOILETS

All impervious vault toilets hereafter constructed or required by the administrative authority to be reconstructed shall comply with the following requirements.

   a. Location Impervious vault toilets shall be located in accordance with the distances given in Table I, (Sec. 10), for the closed portion of the treatment system.

   b. Construction The vault shall be constructed of reinforced, impervious concrete at least 4 inches thick. The superstructure including floor slab, seat, seat cover, riser, and building shall comply with good design and construction practices to provide permanent safe, sanitary facilities. The vault shall be provided with a clean-out opening fitted with a fly-tight cover.

   c. Disposal Wastewater from the impervious vault toilets shall be disposed of at a public sewage treatment facility.

3-1-22 REQUIREMENTS FOR PORTABLE TOILETS

All portable toilets shall be designed to receive and retain the wastes deposited in them and shall be located and maintained in a manner that will prevent the creation of any nuisance condition. Disposal of waste from portable toilets shall be at a public sewage treatment facility.

3-1-23 REQUIREMENTS FOR CHEMICAL TOILETS

1. General Requirements

    a. Tank Chemical toilets for use in isolated residences shall have a receptacle of smooth, impervious material that is resistant to chemical and easily cleanable.

    b. Vent When vents are required for chemical toilets, they shall be of durable corrosion-resistant material installed in a professional manner.

    c. Mixing and Chemical Charge The fixture shall be equipped with a mixing device and shall be charged with the proper concentration of bactericidal chemical or chemicals. Chemical recharges shall be added and mixed with the contents when necessary to maintain sufficient solution strength and to suppress odors.

    d. Toilet Rooms Chemical toilets shall be located in toilet rooms which are well lighted, ventilated, and maintained in a nuisance free condition.

    e. Final Disposal of Receptacle Contents The receptacle contents shall be disposed of in accordance with the requirements of 567--Chapter 68. The recommended method of disposal is discharging to a municipal sewage treatment facility.

3-1-24 OTHER METHODS OF WASTEWATER DISPOSAL

Other methods or types of private wastewater treatment and disposal systems shall be installed only after plans and specifications for each project have been approved by the administrative authority.

3-1-25 DISPOSAL OF SEPTAGE FROM ON-SITE WASTEWATER TREATMENT AND DISPOSAL SYSTEMS

The collection, storage, transportation, and disposal of all septage shall be carried out in accordance with the requirements in 567--Chapter 68.

1. Methods of Septage Discharge

   a. Discharge(with owner approval) to a municipal or other permitted wastewater treatment system.

   b. Discharge (with owner approval) to permitted sludge lagoons or sludge drying beds.

2. Land application in accordance with the following requirements:

   a. The maximum application rate is 30,000 gallons of septage per 365 day period per acre of cropland.

   b. The following site restrictions shall be met when septage is applied to land.

      1. Septage shall not be applied to a lawn or a home garden.

      2. The septage shall be applied only to soils classified as acceptable throughout the top 5 feet of soil profile. The septage shall not be applied to soils profile. The septage shall not be applied to soils classified as sand, loamy sand, and silt. The acceptability of a soil shall be determined using the USDA soil classifications.

      3. Land application sites shall have soil pH maintained above 6.0, unless crops prefer soils with a lower pH conditions. If the soil pH is below 6.0, it is acceptable to use agricultural lime to increase the pH to an acceptable level.

      4. If septage is applied to land on which the soil exceeds the soil loss limits established by the county soil conservation district, the septage shall be injected on the contour, or shall be applied to the surface and mechanically incorporated into soil within 48 hours of application. The septage shall not be applied to ground having greater than 9% slope.

      5 Septage application on frozen or snow-covered ground should be avoided, unless special precautions are taken to avoid runoff. If application on frozen or snow covered ground is necessary, it shall be limited to land areas of less than a 5% slope.

      6. Septage shall not be applied to land that is 35 feet or less from an open waterway. If septage is applied within 200 feet of a stream, lake, ink hole, or tile line surface intake located down gradient of land application site, it shall be injected or applied to the surface and mechanically incorporated into the soil within 48 hours of application.

7. If the septage is applied to land subject to flooding more frequently than once in 10 years, the septage shall be injected or shall be applied to the surface and mechanically incorporated into the soil within 48 hours. Information on which land is subject to flooding more than once in 10 years is available from the Zoning Department.

8. Septage shall not be applied within 200 feet of an occupied residence or within 500 feet of a well.

9. Food crops shall not be harvested for 38 hours after application of septage.

10. Animals shall not be allowed to graze on the land for 30 days after application of septage.

c. One of the following vector attraction reduction, and pathogen reduction requirements shall be met when septage is applied to land.

1. Septage shall be injected below the surface of the land. No significant amount of septage shall be present on the land surface within 1 hour after the septage is injected.

2. Septage applied to the land surface shall be incorporated into the soil within 6 hours of application to or placement of the land.

3. The septage shall be stabilized by adding and thoroughly mixing sufficient lime to produce a mixture with a pH of 12. Provided a minimum of 2 hours of contact time after mixing the lime with the septage prior to applying to land. Each container of septage shall be monitored for compliance.

4. The septage shall be stabilized by adding and thoroughly mixing 50 pounds of lime with each 1,000 gallons of septage.

d. When septage is applied to land, the person who applies the septage shall develop the following information and shall retain the information for 5 years:

1. The location, by either street name or latitude and longitude, of each site on which septage is applied.

2. The number of acres in each site on which septage is applied.

3. The date and time septage is applied to each site.

4. The rate, in gallons per acre per 365 day period, at which septage is applied to each site.

5. A description of how the vector attraction reduction requirements are met.

6. The following certification statement shall be provided with the records when the records are requested by the administrative authority: " I certify, under penalty of law, that the pathogen requirements and the vector attraction reduction requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.

e. Other methods of stabilization may be acceptable if shown to be equivalent to Sec. 25, 3-3

3. Discharge(with owner approval) to permitted sanitary landfill in accordance with 567--Chapter 102 and 103 and the following:

(1) Stabilize the septage by adding and thoroughly mixing sufficient lime to produce a mixture with a pH of 12.

(2) Provide a minimum of 2 hours of contact time after mixing the lime with the septage prior to applying to the landfill.

(3) Dewater the septage.

(4) Obtain a special waste authorization permit from the department.

4. Commercial Septic Tank Cleaners

a. Individual administrative authorities shall enforce the licensing program for commercial septic tank cleaners in accordance with the requirements of 567--Chapter 68

3-1-26 ALTERNATIVE OR INNOVATIVE ON-SITE WASTEWATER TREATMENT AND DISPOSAL SYSTEMS

1. Design Requirements

a. Alternative or innovative systems are to be designed and operated in accordance with approved standards and operating procedures established by the administrative authority.

b. Plans and specifications, meeting all applicable rule requirements, should be prepared and submitted to the administrative authority by a licensed professional engineer. Included with the engineering submittal should be adequate supporting data relating to the effectiveness of the proposed system.

c. For systems designed to discharge treated effluent into water of the state, it will be necessary to obtain a Notice of Intent to fall under the requirements of NPDES General Permit #4. The administrative authority is responsible for determining that the requirements of the permit are met including the monitoring program.

d. Administrative authority should prepare for signature an enforceable agreement to be placed on record which would require that present and future system owners meet all applicable rule requirements. In the event of noncompliance, the administrative authority shall require that adequate steps be taken by the system owner to bring the system into compliance.

e. Wastewater management districts may be formed for the purpose of providing specialized control of on-site wastewater treatment and disposal systems located in certain problem areas or in intensive development areas. Formation of such wastewater management districts shall be coordinated under the guidance of the administrative authority and shall meet all applicable rule requirements.

3-1-27 VARIANCES

Variances to these rules may be granted by the department of natural resources, or the administrative authority provided sufficient information is submitted to substantiate the need and propriety for such action. Applications for variances and justifications shall be in writing, and copies filed with the department.

3-1-29 INSPECTIONS

Whenever the public health sanitarian or designated representative of the Board, has reasonable ground to believe a violation of this ordinance exists, such employee shall ask permission of the owner or occupant to enter upon and make an inspection of such premises, dwelling or other buildings, and to gather other necessary information, including water samples or other necessary specimens for the purpose of laboratory analysis, or to introduce into the system necessary testing materials for tracing the source of any apparent sewage discharge to the surface of the ground. The provisions of this section shall apply to all premises, buildings, dwellings, vacant or occupied. The public health sanitarian, or designated representative of the Board, may make as many additional inspections of such premises as are necessary, and for which that person shall have permission.

3-1-30 REFUSAL OF ADMITTANCE

In the event the public health sanitarian, in proceeding to enter any premises for the purpose of making an inspection to carry out the provisions of this ordinance, is refused entry to all or part of the structure, a complaint may be made under oath to any magistrate of the county, and said magistrate may thereupon issue a warrant directed to some peace officer of the county commanding that officer between the hours of sunrise and sunset ,

accompanied by the public health sanitarian, or designed representative of the board, to enter upon such premises and to make such inspection, and to obtain such samples as may be required to carry out the provisions of this ordinance, which order shall be executed by said officer in accordance with the request of the public health sanitarian.

3-1-31 NOTICES

1. Whenever the public health sanitarian determines that there are reasonable grounds to believe that there has been a violation of any provision of this ordinance, that employee shall give notice of such alleged violation to the persons responsible therefore, as hereinafter provided. Such notice shall:

   a. Be in writing.

   b. Include a statement of the reasons why it is being issued and the section or sections being violated.

   c. Request compliance with this ordinance.

   d. Allow a reasonable time for the performance of any act it requires.

   e. Be served upon the owner, or agent of, or the occupant, as the case may require; provided that such notice shall be deemed to be properly served upon such personally, or if a copy thereof is sent by certified mail to the last known address; or if a copy thereof is posted in a conspicuous place in or about the premises affected by the notice,, and notice is published in accordance with the Rules of Civil Procedure, or if serviced with such notice by any other method authorized or required under the laws of this state.

   f. Such notice may contain an outline of remedial action ,which if taken, will effect compliance with the provision of this ordinance.

3-1-32 HEARINGS

In the event any person is aggrieved by any action taken by the public health sanitarian, such person may within 20 days of the date of such action appeal to the local board, and such action appeal shall be in writing delivered to the Bremer County Health Department, and shall state the reason for requesting such action be rescinded or modified. If in said appeal a hearing before the local board is requested, such hearing shall be granted on or before the next regularly scheduled local board meeting. If the request for the hearing is served within more than thirty(30) days after service of the request. If no request is made for a hearing, the right of hearing shall be deemed waived. The local board shall review the action of public health sanitarian, and if reasonable grounds exist, shall modify, withdraw, or order compliance with the said action.

3-1-33 JURISDICTION

The provision of this ordinance shall apply throughout Bremer County, Iowa, including cities and towns therein.

3-1-34 ENFORCEMENT

It shall be the duty of the Bremer County Board of Health to enforce the provisions of this ordinance, and this duty may be delegated to an authorized representative.

3-1-35 PENALTY

Any person violating this ordinance or any provision thereof after an order of the public health sanitarian, or local board, and after the time for the appeal has expired, or who interferes, or obstruction the local board or public health sanitarian in the conduct of official duties, shall be guilty of a misdemeanor, and upon conviction thereof may be fined not more than $500.00, or imprisoned in jail for a period not to exceed 30 days. Each day that a violation exists constitutes a separate offense.

3-1-36 SUPPLEMENTAL AUTHORITY

No section, clause or provision of this ordinance shall limit the authority of the public health sanitarian, or local board to obtain injunctive, or other relief, or to enforce public health laws, or regulations, or standard in any other lawful manner.

3-1-37 REPEALER

All ordinances or parts of this ordinances in conflict with the provisions of this ordinance are hereby repealed.

3-1-38 SEVERABILITY CLAUSE

If any such, provision or part of this ordinance shall be adjudged invalid or unconstitutional, such adjudication shall not affect the validity of the ordinance as a whole or any section, provision, or part thereof not adjudged invalid or unconstitutional.

TITLE III PUBLIC WORKS

CHAPTER 2 PRIVATE WATER WELL CONSTRUCTION PERMITS

3-2-1 TITLE

The title of this ordinance is Private Water Well Construction Permits.

3-2-2 PURPOSE

The purpose of this ordinance is to protect the public health by protecting groundwater supplies from contamination by establishing uniform minimum standards and methods for well construction and reconstruction for nonpublic water supply wells.

3-2-3 DEFINITIONS

1. Abandoned Well Means a well whose use has been permanently discontinued. A well shall be considered abandoned when its condition is such that continued use is impractical, or no longer desired.

2. Administrative Authority mean the Bremer County Board of Health.

3. Anaerobic Lagoon means an impoundment, the primary function of which is to store and stabilize organic wastes. The impoundment is designed to receive wastes on a regular basis, and the design waste loading rates are such that the predominant biological activity in the impoundment will be anaerobic. An anaerobic lagoon does not include:

   (a) A runoff control basin which collects and stores only precipitation-induced runoff from an open feedlot feeding operation; or

   (b) A waste slurry storage basin which receives waste discharge from confinement feeding operations, and which is designed for the complete removal of accumulated wastes from the basin at least semiannually; or

   (c) Any anaerobic treatment system which includes collection and treatment facilities for all off gases.

2. Annular Space means the open space between the well hole excavation and the well casing.

5. Cesspool means a covered excavation, lined or unlined, into which wastes from toilets or urinals are discharged for disposal. Cesspools are not an approved method of sewage disposal.

6. Compensation for Well Interference means payment to the owner of a non-regulated well for damages caused by a lowered water level in the well due to the withdrawal of water for a permitted use.

7. Confinement Building means a building used in conjunction with a confinement feeding operation to house animals.

8. Conforming Well means a well that complies with the standards of this ordinance, including wells properly plugged according to 567--Chapter 39.

9. Deep Well means a well located and constructed in such a manner that there is a continuous layer of low permeability soil or rock at least 5 feet thick located at least 25 feet below the normal ground surface, and above the aquifer from which water is to be drawn.

10. Earthen Manure Storage Basin means an earthen cavity, either covered or uncovered, which, on a regular basis, receives waste discharged from a confinement feeding operation if accumulated wastes from the basin are completely removed at least once each year.

11. Established Grade means the permanent point of contact of the ground to artificial surface with the casing or curbing of the well.

12. Formed Manure Storage Structure means a structure, either covered or uncovered, used to store manure from a confinement feeding operation, which has walls and a floor constructed of concrete, concrete block, wood, steel, or similar materials. Similar materials may include, but are not limited to plastic, rubber, fiberglass, or other synthetic materials. Materials used in a formed manure structure shall have the structure integrity to withstand expected internal and external load pressures.

13. Grout means a material used to seal the annular space between the casing and the borehole, and shall consist of neat cement, concrete, high solids bentonite slurry, or hydrated bentonite chips.

14. Health-Related Problem means well water that contains any contaminant at a level that exceeds MCLs(maximum contaminant levels), or HALs(health advisory levels) as adopted by the Department of Natural Resources.

15. Heavy Drilling Fluid means water used for drilling which because of the natural clay content of the borehole, or by the addition of bentonite grout has a solids density of at least 10% by weight or a mud weight of at least 9.25 lb/gal.

16. Low Permeability Materials means a geological unit of consolidated material (usually clay or till), or bedrock (usually shale) that is all or partially saturated, and having permeability low enough (10^-7 cm/sec.) to give water in the aquifer artesian head.

17. Nonpublic Water Supply Well means a well that does not supply a public water supply system.

18. Nonregulated Well means a well used to supply water for a non regulated use(a use of water less than 25,000 gallons per day which is not required to have a water use permit).

19. Open Feedlot means an unroofed or partially roofed animal feeding operation in which no crop, vegetation, or forage growth or residue cover is maintained during the period that animals are confined in the operation.

20. Permitted Use means a use of water in excess of 25,000 gallons per day which requires a water use permit pursuant to 567-- Chapters 50 -52 and Iowa Code Chapter 455B, division III, part 4.

21. Pitless Adapter means a device designed for the attachment to one or more openi through a well casing. It shall be constructed so as to prevent the entrance of

contaminants into the well through such openings, conduct water from the well, protect the water from freezing extreme temperature, and provide access to water system parts within the well.

22. Pitless Unit means an assembly which extends the upper end of the well casing to above grade. It shall be constructed so as to prevent the entrance of contaminants into the well, conduct water from the well, and to protect the water from freezing or extremes of temperature, and shall provide access to the well and to water system parts within the well. It shall provide a pitless well cap for the top terminal of the well.

23. Public Water Supply means a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. The term includes

    (1) any collection, treatment, storage, and distribution facilities under control of the supplier of water and used primarily in connection with the system; and

    (2) any collection (including wells) or pretreatment storage facilities not under the control of the supplier which are used primarily in connection with the system. Pumps and pumping equipment or materials, including seals, tanks, fittings and controls utilized or intended for use in withdrawing or obtaining water for any use.

24. Rehabilitation or Reconstruction means modifying the original construction of a well. Rehabilitation or reconstruction includes, but is not limited to, deepening the well, installing a liner, installing or replacing a screen with one of a different diameter or length, installing a pitless adapter, extending the casing, or hydro-fracturing a well. Replacing a screen with one of identical diameter and length, replacing a pitless adapter, or acidizing a well would be considered repair, not rehabilitation or reconstruction.

25. Runoff Control Basin means an impoundment designed and operated to collect and store runoff from an open feedlot.

26. Shallow Well means a well located and constructed in such a manner that there is not a continuos layer of low permeability soil or rock (or equivalent retarding mechanism acceptable to the department) at least 5 feet thick, the top of which is located at least 25 feet below the normal ground surface and above the aquifer from which water is to be drawn.

27. Stuffing Box means an approved receptacle in which packing may be compressed to form a watertight or airtight junction between 2 objects.

28. Well means any excavation that is drilled, cored, driven, dug, bored, augured, jetted, washed, or is other wise constructed for the purpose of exploring groundwater, monitoring groundwater, utilizing the geothermal properties of the ground, or extracting water from or injecting water into the aquifer. "Well" doesn't include an open ditch, drain tiles, an excavation made for obtaining or prospecting for oil, natural gas, minerals, or products mined or quarried, lateral geothermal heat exchange systems less than 20 feet deep, nor temporary de-watering wells such as those used during the construction of sub-surface facilities only for the duration of the construction.

29. Well Liner means a pipe used to line the inside of a well hole, but not designed to hold hydraulic or structural loading. Liners must be installed within a casing or in an ungrouted open bore hole.

30. Well Seal means a device used to cover or seal a well that establishes or maintains a junction between the casing of the well and the piping, electric conduit or equipment installed, so as to prevent water or other foreign material from entering the well at the uppermost terminal.

(a) Well cap means a snug-fitting, watertight device used above the flood level that excludes dust and vermin, and allows for screened venting.

(b) Sanitary seal means a watertight fitting which uses mechanical compression that is installed on wells that terminated in a well house.

30. Well Services means new well construction, well reconstruction, installation of pitless equipment, or well plugging.

3-2-4 APPLICABILITY

The provisions contained herein apply to all nonpublic water supply wells, constructed for the purpose of domestic, livestock, irrigation, recreation, and commercial or industrial use, that are completed after the effective date of these rules. They shall also apply to existing water wells undergoing rehabilitation or reconstruction.

Ponds and surface water supplies are not covered by these standards. Information regarding use of these sources of water should be sought from the administrative authority prior to the development of the sources.

1. Nonconforming Installations Certified well contractors shall ensure that the rehabilitation or reconstruction of nonconforming well adheres to all applicable provisions of this chapter, or to comparable construction, or installation requirements approved administrative authority. When any construction or reconstruction is done on a nonconforming feature of a well, that feature shall be upgraded and brought into compliance with the material and installation standards contained in this ordinance.

2. Exemptions This ordinance shall not apply to public water supply wells, horizontal heat pump installations, elevator shafts, underground storage tank monitoring wells as covered under 567-- Chapter 135, or monitoring well for solid waste disposal facilities as cavered in 567--Chapter 110.

3. In the event of a difference between the provisions of this ordinance and those contained in Chapter 567- 38 & 49, Iowa Administrative Code - Environmental Health the most stringent standards will prevail.

3-2-5 GENERAL

The administrative authority shall have the authority to visit well sites during any phase of the work without prior notice. No well services shall be initiated until a permit has been issued by the proper authority. The administrative authority may also require posting of performance bonds and collection and submission of other data. The issuance of permits is covered in Sec. 21 and shall be coordinated with the water withdrawal permits issued by the Iowa Department of Natural Resources as covered in 567-- Chapters 51 & 52. All well services shall be performed by a certified well contractor, or the property owner as specified in 567-- Chapter 82.

It shall be the responsibility of the certified well contractor to ensure that a well construction permit has been issued prior to initiation of well services. It shall also be the responsibility of the certified well contractor to ensure that all well services are performed in accordance with the provisions of this ordinance.

3-2-6 VARIANCES

Variances to these rules may be granted by the administrative authority if sufficient information is provided to substantiate equal protection, and the need for such action. Variance requests and reasoning shall be in writing. Variance approvals or rejections shall also be in writing.

3-2-7 LOCATION OF WELLS

Wells shall be located with consideration given to the lot size, contour, porosity and absorbency of the soil, local groundwater conditions, flooding, and other factors necessary to implement the rules. The lack of specific distances to other possible sources of contamination, such as refuse disposal sites and high-pressure gas lines, does not minimize their potential hazard. These must be evaluated in each particular situation and a distance arrived at that is based on pertinent facts. The well contractor shall consult administrative authority for assistance in determining a proper distance in such cases.

1. Minimum distances The following minimum lateral distances shall apply for the common sources of contamination listed in the following table.

Sources of Contamination	Minimum Lateral Distance(feet)	
	Shallow Well	Deep Well
Formed Manure storage structure, confinement building, feedlot solids settling facility, open feedlot	200	100
Public water supply well	400	200
	All Wells	
Earthen manure storage basin, runoff control basins and anaerobic lagoons(see subrule Sec. 7 #2)	1000	
Domestic wastewater lagoon	400	
Sanitary landfills	1000	
Preparation or storage area for spray materials, commercial fertilizers, or chemicals that may result in groundwater contamination	100	
Drainage wells	1000	
Conforming wells	10	
Nonconforming wells	100	
Soil absorption field, any sewage treatment system with an open discharge, pit privy, or septic tank discharge line (not conforming to 567--Chapter 69)	100	
Septic tank, concrete vault privy, sewer of tightly joined tile or equivalent material, sewer-connected foundation drain, or sewers under pressure	50	
Sewer of cast iron with leaded mechanical joints, sewer of plastic pipe with glued or compression joints, independent clear water drains, cisterns, well pits, or pump house floor drains	10	
Hydrants	10	
Property lines (unless a mutual easement is signed and recorded by both parties)	4	

Liquid hydrocarbon storage tanks	100
Ditches, streams, ponds, or lakes	25

2. Exception to minimum lateral distances The minimum separation distance between a well and an anaerobic lagoon, earthen manure slurry storage basin, earthen manure storage basin, or runoff control basin shall be 400 feet if the lagoon or basin was permitted by the department after January 1, 1989, or if the applicant demonstrates through percolation testing that the seepage loss through the lagoon or basin does not exceed 1/16 in/day (0.0625 in/day). The percolation test shall meet the requirements of ASTM-1587 and 567- -subrule 65.15(11).

3. Relation to Buildings The well shall be located so that no building interferes with reasonable access for cleaning, treatment, repair, testing, inspection, and other maintenance. Wells shall not be located in basements.

4. Easements No well shall be located on a property not owned by the well owner unless an easement allowing such placement is reviewed and approved by the administrative authority and the easement is legally recorded.

3-2-8 STANDARDS FOR WELL CONSTRUCTION

1. General construction requirements Wells shall be planned and constructed to adapt to the geologic and groundwater conditions of the proposed well site to ensure reasonable utilization of every natural protection against contamination of the water-bearing formation(s) and the exclusion of possible sources of contamination, to attempt to produce bacterially safe water which is free of health-related problems.

2. Water used in construction Water used in the construction process shall be obtained from a potable water source that will not result in contamination of the well. Water use for drilling shall be treated with 3 pints of 5.25% sodium hypochlorite solution per 100 gallons of water or 0.24 pounds of 65% calcium hypochlorite per 100 gallon of water or other additives to produce an equivalent concentration of chlorine residual (50 ppm).

3. Wellhead The upper terminal casing of all wells shall extend at least 12 inches above established grade or pump house floor, or the 100 year flood level, whichever is higher. A well cap or sanitary seal shall be installed immediately following well completion. A well cap shall be used on an exposed well, a sanitary seal only on a well terminating within a well house. Any openings in the cap or seal, such as for the pump wiring or water depth measurement, shall be properly grouted or sealed except properly screened and oriented vent openings. The ground water surface immediately adjacent to the well casing shall be compacted and graded so that surface water is diverted away from the casing. Well platforms are not recommended

other than those used as pump house floors as indicated in Sec.13 subrule #2.

5. Criteria for well interference protection 567-- Chapter 54 provides an administrative process for owner of non-regulated wells to receive compensation for well interference caused by permitted uses. To be eligible for compensation due to interference, non-regulated wells constructed after July 1, 1986, must be constructed to allow for some potential well interference. Allowances for potential well interference is accomplished by constructing a non-regulated well to anticipate a lowering of the static head of the well which may be caused by interference from a nearby permitted use well.

   (a) The well must be drilled deep enough to allow for setting the pump at least 10 feet, or half the normal pumping draw down, whichever is greater, below the initial recommended setting depth.

   (b) If the well draws from an unconfined aquifer, the static water level may drop to half the saturated thickness of the aquifer before well interference is considered, if the calculation in "a" above should indicate a Shallower depth. Shallow aquifers that are only slightly confined may be classified as unconfined aquifers for this purpose.

   (c) Where a well penetrates a confined aquifer, the static water level is protected only to the top of the aquifer if the calculation in "a" above should indicate a deeper level.

   (c) Protected levels for flowing well will be considered the top of the confined aquifer or 100 feet below the surface, whichever is higher. Flowing wells must be constructed to accommodate a pump capable of supplying a sufficient water supply at protected levels.

   The well design also needs to consider drought and reduced well efficiency. (Additional information is contained in 567-- Chapter 54)

   A well that is used to withdraw more than 25,000 gallons of water per day requires a water use permit from the Iowa Department of Natural Resources. Upon obtaining such a permit, the well is called a permitted use. If a permitted use exists prior to the construction of a well without a water use permit, no compensation for well interference will be allowed unless a significant change in the permitted use occurs. A physical change to withdrawal facilities may be considered a significant change to a permitted use(e.g. moving the withdrawal location, installing a new well, or installing a higher capacity pump). A person desiring to construct a well not requiring a water use permit should first obtain information concerning nearby permitted use wells. The Department of Natural Resources will provide information on permitted use wells upon request.

6. Access port for measurement of water levels Permitted use wells shall be equipped

with an access port having a minimum diameter of ¾ inch. The access port shall be fitted with a threaded cap or plug, and be located to allow insertion of a steel tape or electric probe into the well for measurement of water levels. When a spool type of pitless adapter is used which obstructs clear access to the water, a ¾ inch pipe shall be attached to the spool and brought to the surface below the well cap to allow water level measurements. Wells not requiring a water use permit should be constructed with an access port for water level measurement for possible future well interference concerns.

7. Interconnection of aquifers There may be local confining beds that serve an important protective function. Permitted use wells shall use casing and grouting to maintain a hydraulic separation between distinct aquifers separated by confining intervals. Extreme caution should be exercised in the construction of non-permitted use wells if allowing the well to connect aquifers across confining intervals, particularly in areas where that would open the aquifer to surficial contamination, i.e., in areas where the upper rock unit is un-confined or contains less than 40 feet of unconsolidated materials, The administrative authority shall be consulted for possible local regulations when interconnection of aquifers across confining intervals is anticipated.

3-2-9 TYPES OF WELL CONSTRUCTION

1. Drilled wells

   a. Drilled wells in unconsolidated materials

      (1) Depth: In no case shall less than 20 feet of permanent casing be installed in wells drilled in unconsolidated materials. If the alluvial aquifer where the water is to be drawn from is covered by less than 40 feet of low permeability materials, the well screen shall be set at the bottom of the water-bearing aquifer or at least 60 feet from the surface. (Deeper depths may be required if nitrate contamination is excessive.) If more than 40 feet of low permeability materials are present above the aquifer, the casing shall extend down at least to the top of the aquifer.

      (2) Grouting: Grout shall be placed to a minimum depth of 40 feet or along the full length of the casing where less than 40 feet of casing is set. Grouting the full length of the casing below 40 feet may be necessary to isolate any contaminated water lenses or aquifers. If a layer of low permeability material at least 5 feet thick is encountered less than 40 feet from the surface, the grout may be terminated no less than 5 feet below the top of this low permeability material, but in no case less than 20 feet from the ground surface. Grout must be placed in accordance with Sec.10 subrule #6 except when driving casing. When driving casing a #8 mesh bentonite or bentonite grout must be maintained around the outside of the casing. The bottom of driven casing must be equipped with a drive shoe.

(3) Annular Space: The diameter of the borehole shall be at least 3 inches greater that the outside diameter of the well casing to the minimum grouting depth. When steel well casing pipe is installed using percussion methods, the annular space shall be at least 5 inches greater than the outside diameter of the well casing to a minimum depth of 25 feet.

(4) If the depth of casing is greater than 40 feet, the annular space below 40 feet may be filled with heavy drilling fluid taken from the borehole as long as the top 40

b. Drilled wells in consolidated material.

(1) Minimum casing depth: Casing shall extend to a depth of at least 40 feet and be dolomite that does not produce water, the casing shall extend through the creviced formation, be seated in firm rock and be properly grouted.

(2) Grouting: For bedrock wells, full-length grouting of the casing is strongly hammer/rotary drilling. When driving casing #8 mesh bentonite, or bentonite grout must be maintained around the outside of the casing. The bottom of driven casing must be equipped with a drive shoe. If a layer of low permeability material at least 5 feet thick is encountered less than 40 feet from the surface, the grout may be warrant, the administrative authority may require more extensive grouting to

(3) Annular Space: The bore hole shall be at least 3 inches greater than the outside diameter of the well casing for the upper 40 feet or the minimum grouting depth. When steel casing pipe is installed using percussion, or casing-hammer/rotary methods, the annular space shall be at least 5 inches greater than the outside diameter of the well casing to a minimum depth of 25 feet. When bedrock wells are full-length pressure-grouted through the casing, the bore hole diameter shall be 3-inches larger than the outside diameter of the casing for the minimum depth of at least 25 feet.

(4) If the depth of the casing is greater than 40 feet, the annular space below 40 below 40 feet shall be kept as small as possible to avoid settling.

(5) In fractured rock, where circulation of slurry cannot be maintained, grouting may be done with bentonite chips. The chips shall be hydrated with 1 gallon of water per bag of bentonite.

2. <u>Bored and augured wells in unconsolidated materials</u> For bored or augured wells with concrete or clay tile casing at least 18 inches in diameter, buried-slab construction is required.

a. Casing: The concrete or vitrified clay pipe casing shall be terminated not less than 10 feet below ground surface and extend to a minimum depth of 20 feet. The casing shall be fitted with a reinforced concrete or steel plate into which a water tight steel or thermoplastic casing is firmly imbedded in or connected to a pipe cast or welded into the plate. This casing shall be at least 5 inches in diameter and shall extend from the plate to not less than 12 inches above the established grade or the 100 year flood level, whichever is higher. A pitless adapter shall be installed below frost depth on the newly installed plastic or steel casing.

c. Backfilling annular space: A 12 inch grout seal shall be poured over and around the plate. The annular space between the steel or thermoplastic casing and the borehole shall be backfield with clean compacted soil free of debris or large organic material. During the back filling process, the earth shall be thoroughly tamped to minimize settling. Grading around the well shall be accomplished in accordance with Sec 8 subrule #3.

3. Driven and direct push wells Sandpoint wells are typically constructed in sandy areas with a high water table. Groundwater in these areas is often susceptible to contamination. This type of construction is not recommended for potable water supply. Sand point wells shall meet the requirements of this ordinance except for casing depth and grouting requirements.

4. Flowing artesian wells Drilling operations shall extend into but not through the formation confining the water. The casing shall then be installed and the annular space full-length pressure-grouted and allowed to set. After allowing the grout to set, the drill hole shall be extended into the confined water-bearing formation. Flow control from the well shall be provided by valued pipe connections or a receiving tank set at an altitude corresponding to that of the artesian head. Under no circumstances shall the water flow uncontrolled to waste. A direct connection between the discharge pipe and receiving tank, sewer, or other source of contamination is prohibited.

3-2-10 MATERIAL STANDARDS

All materials utilized in well water construction shall conform to the standards of the American Water Works Association (AWWA), the American Petroleum Institue (API), the American Society for Testing and Materials (ASTM), and the National Ground Water Association (NGWA) except as modified by these standards.

1. Water well casing

a. Steel well casing and couplings

(1) Steel well casing pipe shall have the dimensions and weights specified in Table 10 – 4.
Well casing pipe shall be new steel pipe meeting one of the following standards:

1. ASTM A 53-96
2. ASTM A 106-95
3. ASTM A 589-95a - Type I, II, or III
4. API 5CT (5th edition, 4/1/95)
   API 5D (3rs edition, 8/1/92)
   API 5L (41st edition, 4/1/95)

(Copies of these standards are available for inspection at the Des Moines office of from the American Society for Testing and Materials, 100 Barr Habor Drive, West Conshohocken, Pennsylvania 19428-2959, or the American Petroleum Institute, 1220 L Street Nw, Washington DC 20005.)

2. Each length of casing shall be legibly marked in accordance with API or ASTM marking specifications showing the manufacturer's or processor's name or trademark, size in inches,weight in pounds per foot, whether seamless or welded (type of weld) and the API or ASTM specifications or trade monogram.

3. All casing pipe joints shall be watertight welded construction or threaded couplings.

4. Minimum casing pipe and coupling weights and dimensions are as follows:

Table 10 – 4

Minimum casing pipe and coupling weights and dimensions

b. Thermoplastic casing and couplings

(1) Materials: Thermoplastic well casing pipe and couplings shall be new polyvinyl chloride (PVC) or acrylonitrile-butadiene-styrene (ABS) material produced to and meeting the ASTM F 480 standard and shall have a standard dimension ratio (SDR) of 21, 17, or 13.5, a dimension ratio (DR) of 18 or 14, or a schedule 40 or 80 rating depending upon the specifications. Styrenerubber thermoplastic well casing pipe, including ASTM F 480, may not be used.

(2) Potable water standards: The thermoplastic well casing pipe, pipe couplings, Standard #14 as they relate to well casing pipe, or an approved equivalent. organization.

(3) Markings: Each length of casing shall be legibly marked showing the manufacturer’s or trade manufacturer's or trade monogram. monogram.

(4) Casing joints: The thermoplastic pipe shall be assembled with either flush- specifications in ASTM F 480.

(5) Hydraulic collapse pressure for plastic casing: The following table provides specifications for maximum hydraulic collapse pressure (in feet of water head) to which PVC well casing of different strengths can be installed

Table Sec. 10, 4, b (5)
PVC WELL CASING
Maximum Hydraulic Loading (in feet water head)

	ASTM F 480 or ASTM 2241			C-900		ASTM 1785	
Size	SDR 21	SDR 17	SDR 13.5	DR 18	DR 14	SCH. 40	SCH. 80
4"	257`	496`	1,024`	--	--	353`	1,055`
4½"	257`	496`	1,024`	--	--	---	------
5"	257`	496`	1,024`	--	--	236`	758`
6"	257`	496`	1,024`	490`	956`	177`	678`
8"	257`	496`	1,024`	490`	956`	121`	471`
10"	257`	496`	1,024`	490`	956`	90`	404`
12"	257`	496`	1,024`	490`	956`	74`	376`
16"	257`	496`	1,024`	490`	956`	70`	350`

(1) Determine by formulae in ASTM F 480 with Poisson's Ratio of .38

(6) When cement grout is used with thermoplastic casing, the manufacturer's specifications

(7) Thermoplastic pipe extending above ground shall be protected from ultraviolet light exposure.

(8) Under no circumstances shall thermoplastic water well casing de driven.

5. Grouting guides Casing that is to be grouted shall have a minimum of 2 sets of centering guides attached to the casing so as to permit the unobstructed flow and deposition of grout.

6. Gouting Materials and procedures for grouting shall be as follows:

a. cement, sand aggregate and water, in the proportion of one bag cement (94lbs) and an Standard C 494-92. Concrete grout may be used with permission of the administrative authority where large void spaces need to be filled.

b. Neat cement grout: The mixture shall consist of 1bag of cement (94lbs) to not more than 6 gallons of clean water. Admixtures to reduce permeability or control setting time must meet ASTM Standard C 494-92.

c. Bentonite grout: This is a mixture of water and commercial sodium-bentonite clay manufactured for the purpose of water well grouting. Mixing shall be per manufacturer's polymers used in grout mixtures must meet NSF Standard 60.

d. Exclusion: Drilling fluids and cutting may not be used as grouting material to satisfy the minimum grouting requirements.

e. Application: Grouting shall be performed by pumping the mixture into the annular space from the bottom upward through the casing or through alternate pipe until the annular space is filled. Grouting shall be done in one continuous operation, if possible. The bottom of the termie pipe must remain submerged in grout while grouting.

f. Exceptions: The exceptions to this method of application are the use of buried-slab, percussion, or casing-hammer/rotary methods to construct a well. The proper grouting methods for these types of wells are specified in Sec. 9 subrules 1 & 2. Another exception is where dry bentonite is required because circulation cannot be maintained as described in Sec. 9 subrule 1 part b, section 5.

7. Pitless Adapters & Pitless Units

a. Pitless adapters and pitless units conforming to Pitless Adapter Standard - 97 as Department of Natural Resources records center or may be obtained for the personal use from the Pitless Adapter Division, Water Systems Council, 800 Roosevelt Road, Bldg. C, Suite 20, Glen Ellyn, Illinois 60137.

c. A pitless subsurface pipe connection to a well casing pipe shall be made with a weld-on, clamp-on, or bolt-on pitless adapter, weld-on ,or threaded pitless unit. Above-ground discharge pitless adapters are prohibited.

d. Grouting pitless adapters and pitless units: After connecting a pitless adapter or unit, the area surrounding the unit must be uniformly filled with dry bentonite.

e. If the pitless adapter is gasketed, the opening in the casing shall be sawed to the diameter recommended by the manufacturer, with a hole saw and not cut with a torch. The pitless adapter used shall have the correct curvature to fir the diameter of the casing.

3-2-11 REHABILITATION OR RECONSTRUCTION

All well rehabilitation or reconstruction must meet the requirements of this ordinance. If the well feature needing rehabilitation/reconstruction cannot be brought into compliance with these rules, the well must be properly plugged.

1. Installing a liner If the rehabilitation/reconstruction will involve the placement of a liner, the certified well contractor must then determine whether the proposed rehabilitation/reconstruction is to be done to correct a health-related problem. The work to be performed must then be done in accordance with paragraph "a" or "b" below.

a. Standards for installation of a liner to correct a health-related problem.
(1) The liner shall have a minimum of 2 sets of centering guides to allow the proper placement of grout. In no case shall the liner be driven into place.

The liner shall extend to the ground surface or top of the pitless adapter.

The annular space between the old casing and the liner shall be pressure- grouted in place throughout its entire length using an approved grout.

b. Standards for the installation of a liner to correct a problem that is not health related.

(1) The liner shall extend at least10 feet above the static water level, or if a caving zone is present, shall extend above this region.

(2) The liner may be pressure grouted in place if there is a sufficient annular space for proper application of the grout.

c. Liner material standards: Liners must meet well casing standards as defined in Sec. 10 Plastic liners must have a standard dimension ratio of 26 or less or a schedule ratio of SCH 40 or SCH 80. If the installation does not meet the definition of a liner, the casing material shall be used.

3-2-12 DISPOSAL OF DRILLING MUD

Drilling fluid and mud remaining after construction of a well shall not be disposed of in a steam of storm sewer nor shall these materials be discharge into a sanitary sewer without permission of the land owner and operator of the wastewater treatment facility.

3-2-13 WATER DISTRIBUTION SYSTEMS

1. Pumphouse appurtenances When pump houses are utilized, they shall be constructed above established grade permitting access to the well and pump for maintenance and repair. The pump room shall be provided with an independent floor drain that discharges to ground surfaces. The outside opening of this drain line shall be fitted with a brass, bronze, or copper 16 mesh screen to exclude the entrance of pests.

2. Pump house floors The top of the well casing shall terminate at least 12 inches above the pump house floor. The pump house floor shall be constructed of concrete that is not less than 4 inches in thickness and is sloped away from the casing. A watertight seal to provide resiliency shall be provided between the casing and the pump house floor.

3. Frost pits Wells are not permitted to be located within frost pits. Frost pits that do not contain wells within are permitted for the purpose of housing pressure tanks and valves, for example, provided they are not located closer than 10 feet from any well. Frost pits shall be constructed so as to be weatherproof and vermin-proof and an independent floor drain or a sump pump shall be provided.

4. Pumps and pumping equipment

    a. General pump installation requirements: The installation of pumps shall be planned and carried out so the pump will be:

        (1) Installed so that it and its surroundings are in a sanitary condition;

        (2) Properly sized so ass to provide the volume of water necessary, where obtainable, for an adequate water supply;

        (3) Designed to meet the well characteristics and not exceed the yield of the well except when the available aquifer is low producing;

        (4) Installed for operation without priming or breaking suction;

        (5) Installed in such a manner as to provide adequate protection against contamination of the water supply from any surface or subsurface sources;

        (6) Installed in a manner so that it is accessible for maintenance, repair, and removal.

    b. Lubrication: Pump motor lubrication or coolant oil shall be USDA or FDA approved food contact grade formulation.

    c. Well/Pump discharge: Every pump shall be installed with an above-ground discharge, an approved subsurface pitless adapter unit, or an approved subsurface well casing pipe connection.

d. Other power pumps: Other power pumps located over the well shall be mechanically the well, and the pump delivery or suction pipe emerges from the top. I these units are located in a basement, all suction lines shall be elevated at least 12 inches above the floor and shall be encased in a protective galvanized steel pipe.

e. Hand pumps or similar devices: A hand pump, hand pump head, stand, or similar device must have a closed and screened spout, directed downward. The pump must have a concrete slab at least 4 inches thick extending horizontally at least 1 foot in every direction from the well casing and sloped to divert water away from the casing. A watertight seal must be provided between the casing and the slab. A reciprocating pump rod must operate through a stuffing box.

f. Well disinfection after pump installation or repair: Wells must be properly disinfected by the pump installer as decribed in Sec.14 after pump installation or repair of pumps.

g. Interconnections and cross connections. No connection between a well or boring and another well, boring, water supply system, or contamination source is allowed unless the connection is:

(1) Protected by an air gap

(2) Protected by a backflow prevention device; or

(3) Between wells or borings that meet the construction standards of this ordinance, are used for the same purpose, and have equivalent quality water supply.

5. Hydropneumatic(pressure) tanks Pressure tanks should be sized by pump capacity and expected usage. They must be installed in accordance with manufacturers' directions and shall maintain a pressure of at least 15lbs at the highest point of usage under normal demand.

6. Filters and water treatment equipment Filters and water treatment equipment shall be installed and operated in accordance with manufacturers' directions.

3-2-14 WELL DISINFECTION

All new, repaired, or rehabilitated wells shall be pumped to waste until the water is free of drilling mud, drill cuttings and sand, and the water is reasonably clear. Wells shall be disinfected by the contractor following of construction and whenever the well seal or cap is removed and work is done within the casing. A chlorine solution such as a sodium or calcium hypochlorite shall be used. Chlorine compounds having special additives shall not be used.

1. The disinfectant shall be dispersed throughout the entire water column in the well. The disinfectant shall also be brought into contact with the inside of the well casing pipe above the static water level.

2. The disinfectant shall remain in the well for a minimum of 2 hours if a concentration of at least 100 mg/l chlorine is achieved, or a minimum of 24 hours if at least 50 mg/l is achieved.

3. For emergency situations, a contact time of a minimum of 30 minutes shall be provided at a chlorine concentration of at least 200 mg/l.

4. The amount of HTH or household bleach required for a chlorine concentration of 200 mg/l is given in the following table:

Table Sec.13 sub-rule #4

Amount of chlorine disinfectant required for every 25 feet of water in a well

Well Casing Diameter (in inches)	4"	6"	8"	12"	18"	24"	30"	36"
Amount of HTH (in ounces containing ~ 70% Ca(OCl)2)	0.7	1.5	2.6	5.6	13	23	26	52
Amount of Chlorine Bleach (in pints containing 5.25% NaOCl)	0.5	1.2	2.1	4.7	10.6	18.8	29.3	42.2

5. The disinfectant shall be introduced into the well in a solution of disinfectant and water. In no case shall pressed pellets of disinfectant, when used for shock chlorination, be introduced directly into the well without first being dissolved.

3-2-15 WATER SAMPLING AND ANALYSIS

1. In all pressure water systems, provisions shall be made for collection of water samples directly from the well by installation of a sampling faucet before the pressure tank, and prior to encountering any water treatment equipment. The sampling faucet shall be installed at least 12 inches above the floor, have a down turned spout and be in an accessible location. All sample faucets shall be metal and have a smooth (non-threaded) outlet.

2. The owner of a new, repaired, or rehabilitated well shall be responsible for contacting the administrative authority who will take a water sample and submit it to a certified laboratory for coliform bacteria and nitrate analysis. The water sample shall be collected at least 10 days and not more than 30 days after a well is put into service following the construction, repair, or rehabilitation.

3. If the water sample analysis detects presence of bacteria, the disinfection procedure decribed in rule Sec. 13 shall be repeated.

3-2-16 ABANDONMENT OF WELLS

Abandoned wells are a contamination hazard to the water bearing formation as well as a physical hazard for people.

1. Plugging rules: Abandoned wells shall be properly plugged as required in 567--Chapter 39.

2. Waste disposal prohibition: Under no circumstances shall abandoned wells be used for the disposal of debris, solid waste, septic tank sludge, or effluents, or for any other type of unauthorized disposal of waste materials, or as a receptacle for field tile drain field.

3-2-17 CLOSED CIRCUIT VERTICAL HEAT EXCHANGERS

These provisions apply to closed circuit vertical heat exchanger construction

1. Piping used must be 160 psi pressure rated high density polyethylene or polybutylene.

2. Connection to piping must use socket fusion or butt fusion joining methods.

3. Piping must be pressure tested with air or portable water for 15 minutes at a pressure of 1.5 times the system operating pressure after installation in the bore hole.

4. The annular space between the vertical heat exchanger piping and the bore hole must be grouted as required in Sec. 10 sub-rule #3 using an approved grouting method and material. Grout shall be placed at least in the top 40 feet. Any confining layers between aquifers shall be replaced with grout. Grouting must be performed within 24 hours of completion of the bore-hole.

5. Only food grade or USP grade propylene glycol or calcium chloride may be used as heat transfer fluid. Any other materials or additives must be NSF approved for drinking water

6. A flow measurement device must be installed on each system.

7. Water make-up lines to the vertical heat exchanger must be protected with a backflow prevention device.

3-2-18 PERMIT REQUIREMENT

1. When a permit is required A landowner or landowner's agent shall not drill or construct a new private water well without first obtaining a well construction permit. Examples of private water wells requiring well construction permits include, but are not limited to: domestic wells, livestock wells, irrigation wells, recreational use wells, monitoring wells, heat pump wells, industrial wells and de-watering wells, except that de-watering wells shall be exempt from the construction standards of this

ordinance.

2. Exemptions The following types of excavations do not need private water well construction permits; soil borings, percolation test holes, sand and gravel and limestone explorations holes, excavations for storing and extracting natural gas or other products, gravel pits and quarries and all monitoring wells required as part of a permit or a construction approval issued by the department. Test holes, used to determine the availability, quality, or depth of the groundwater are also exempt provided all the following conditions are met.

   a. The use of the test hole is limited to the conduct of the test only.

   b. The duration of the test is not more than 7 consecutive days.

   c. The test hole is properly closed immediately after the test is completed in accordance

3. Caveat Nothing in these rules shall be constructed as exempting public water supply wells from the construction permit and water withdrawal permit provisions of the environmental protection commission rules, 567 - Iowa Administrative Code.

3-2-19 FORM OF APPLICATION

Applications shall be made on forms supplied by the Board of Health. Each application shall list all wells, including abandoned wells, on the applicant's property contiguous to the well site described in the application and shall describe the location of each well site. The location shall be given in the form of a legal description (section, township, and range) to the nearest quarter of a quarter of a quarter section and noted on a map or aerial photograph. The list of wells to be registered shall include but is not limited to abandoned well, inactive wells, agricultural drainage wells, irrigation wells, domestic wells, and livestock wells.

3-2-20 FEES

The fee schedule shall be as adopted by resolution of the Board of Supervisors.

3-2-21 WELL MAINTENANCE AND RECONSTRUCTION

A private well construction permit is required for all replacement wells. A private well construction permit is required for the repair, maintenance, rehabilitation, or reconstruction of an existing well. Changes in physical dimensions include, but are not limited to: deepening of the well and changing the diameter of the casing or the screen.

3-2-22 PERMIT ISSUANCE AND CONDITIONS

1. When issued Upon receipt of a complete application, the administrative authority shall issue a permit to the landowner or landowner's agent except as provided in

2. Not withdrawal permit Each permit shall include notification that a private well construction permit is not a water withdrawal permit and does not eliminate the necessity of obtaining any water withdrawal permits required in 567--Chapters 51 & 52, Iowa Admin. Code. A water withdrawal permit is required before an applicant can withdraw more than 25,000 gallons of water per day from any source or combination of sources in the state of Iowa.

2. Construction by a registered well driller Each well construction permit shall require that each well shall be constructed by a registered well driller in compliance with Iowa Admin. Code 567-- Chapters 37 & 49. However, temporary de-watering wells at construction sites shall be exempt from the construction standards of Chapter 49.

3-2-23 EXPIRATION OF A PERMIT

A private well construction permit shall expire one calendar year from the date of issuance. If construction of the proposed well is not started prior to the expiration date, a new application plus a new non-refundable fee must be filed with the Board of Health.

3-2-24 DENIAL OF A PERMIT

The administrative authority may deny a private well construction permit if granting the permit would lead to the violation of state law, would result in ground-water contamination, would lead to withdrawal from a protected source; or it is determined that the well would threaten public health or environment.

3-2-25 TRANSFERABILITY

A private well construction permit is not transferable.

3-2-26 PRIVATE SYSTEMS CONTRACTOR'S INSURANCE

Any person, firm, or corporation desiring to construct, alter or repair any private water system within Bremer County, Iowa shall first file with the Bremer County Board of Health a Certificate of Insurance with $100,000 minimum liability limits except where a person, firm, or corporation desires to construct alter or repair any private water system of which he or they are owner or owners of record, such work may be done by a member of his or their immediate family, household, firm, or corporation without requiring such Insurance.

3-2-27 INSPECTIONS

Whenever the Health Official has reasonable grounds to believe that a violation of this ordinance exists, they may enter and make an inspection of such premises, dwelling, or other building, and to gather other necessary information, including water samples or

other necessary specimens for the purpose of laboratory analysis. The owner, or occupant of such premises shall permit the health officer to enter such premises and to make such inspection, and to obtain such samples, at the request of the health officer. Such inspection, shall be made between the hours of 8:00 a.m. and 4:30 p.m., as necessary , or in the case of emergency. The provisions of this Section shall apply to all premises, buildings, or dwellings, vacant or occupied. The health officer may make as many additional inspections of such premises as are deemed necessary. Every occupant of a dwelling or dwelling unit shall give the owner thereof, or his agent or employee access to any part of such a dwelling or dwelling unit, or its premises, at all reasonable times for the purpose of making such repairs or alterations as are necessary to effect compliance with the provisions of this ordinance or with any lawful Regulation adopted or any lawful order issued pursuant to the provisions of this ordinance.

3-2-28 REFUSAL OF ADMITTANCE

In the event the health officer, in proceeding to enter any premises for the purpose of making an inspection to carry out the provisions of this ordinance, shall be refused entry, a complaint may be made under oath to any magistrate of the county and said magistrate shall thereupon issue his warrant directed to some peace officer of the county commanding him between the hours of sunrise and sunset, accompanied by the health officer, to enter upon such premises and to make such inspection, and to obtain such samples as may be required to carry out the provisions of this ordinance, which shall be executed by said officer under direction of the administrative authority.

3-2-29 NOTICE

1. Whenever the health officer determines that there are reasonable grounds to believe that there has been a violation of any provisions of this ordinance or any regulation pursuant thereto, he shall give notice of such allege violation to the person or persons responsible therefore, as hereinafter provided, Such notice shall:

    a. Be in writing.

    b. Include a statement of the reasons why it is being issued.

    c. Allow a reasonable time for this performance of any act it requires.

    d. Be served upon the owner or his agent or the occupant, as the case may require; provided that such notice shall be deemed to be properly served upon such owner or agent, or upon such occupant, if a copy therefore is served upon him personally; or if a copy thereof is sent by certified mail to his last known address; or if a copy thereof is posted in a conspicuous place in or about the premises affected by the notice; or if he is served with such notice by any other method authorized or required under the laws of this State.

2. Such notice may contain an of remedial action which, if taken, will effect compliance with the provisions of this ordinance and with other pertinent regulations of the administrative authority.

3-2-30 HEARINGS

In the event any person is aggrieved by any action taken by the health officer, such person may within 20 days of the date of such action appeal to the local board, and such action appeal shall be in writing delivered to the Bremer County Health Department, and shall state the reason for requesting such action be rescinded or modified. If in said appeal a hearing before the local board is requested, such hearing shall be granted on or before the next regularly scheduled local board meeting. If the request for the hearing is served within more than thirty (30) days after service of the request. If no request is made for a hearing, the right of hearing shall be deemed waived. The local board shall review the action of health officer, and if reasonable grounds exist, shall modify, withdraw, or order compliance with the said action.

3-2-31 JURISDICTION

The provision of this ordinance shall apply throughout Bremer County, Iowa, including cities and towns therein.

3-2-32 ENFORCEMENT

It shall be the duty of the Bremer County Board of Health to enforce the provisions of this ordinance, and this duty may be delegated to an authorized representative.

3-2-33 PENALTY

Any person violating this ordinance or any provision thereof after an order of the public health sanitarian, or local board, and after the time for the appeal has expired, or who interferes, or obstruction the local board or public health sanitarian in the conduct of official duties, shall be guilty of a misdemeanor, and upon conviction thereof may be fined not more than $500.00, or imprisoned in jail for a period not to exceed 30 days. Each day that a violation exists constitutes a separate offense.

3-2-34 SEVERABILITY CLAUSE

If any such, provision or part of this ordinance shall be adjudged invalid or unconstitutional, such adjudication shall not affect the validity of the ordinance as a whole or any section, provision, or part thereof not adjudged invalid or unconstitutional.

3-2-35 SUPPLEMENTAL AUTHORITY

No section, clause or provision of this ordinance shall limit the authority of the public health sanitarian, or local board to obtain injunctive, or other relief, or to enforce public health laws, or regulations, or standard in any other lawful manner.

3-2-36 REPEALER

All ordinances or parts of this ordinances in conflict with the provisions of this ordinance are hereby repealed.