Well & Wastewater System Maintenance & Responsibilities for Rural Residents/Land Owners

BECKY SCHUERMAN

DOMESTIC WATER/WASTEWATER MGT. PROGRAM

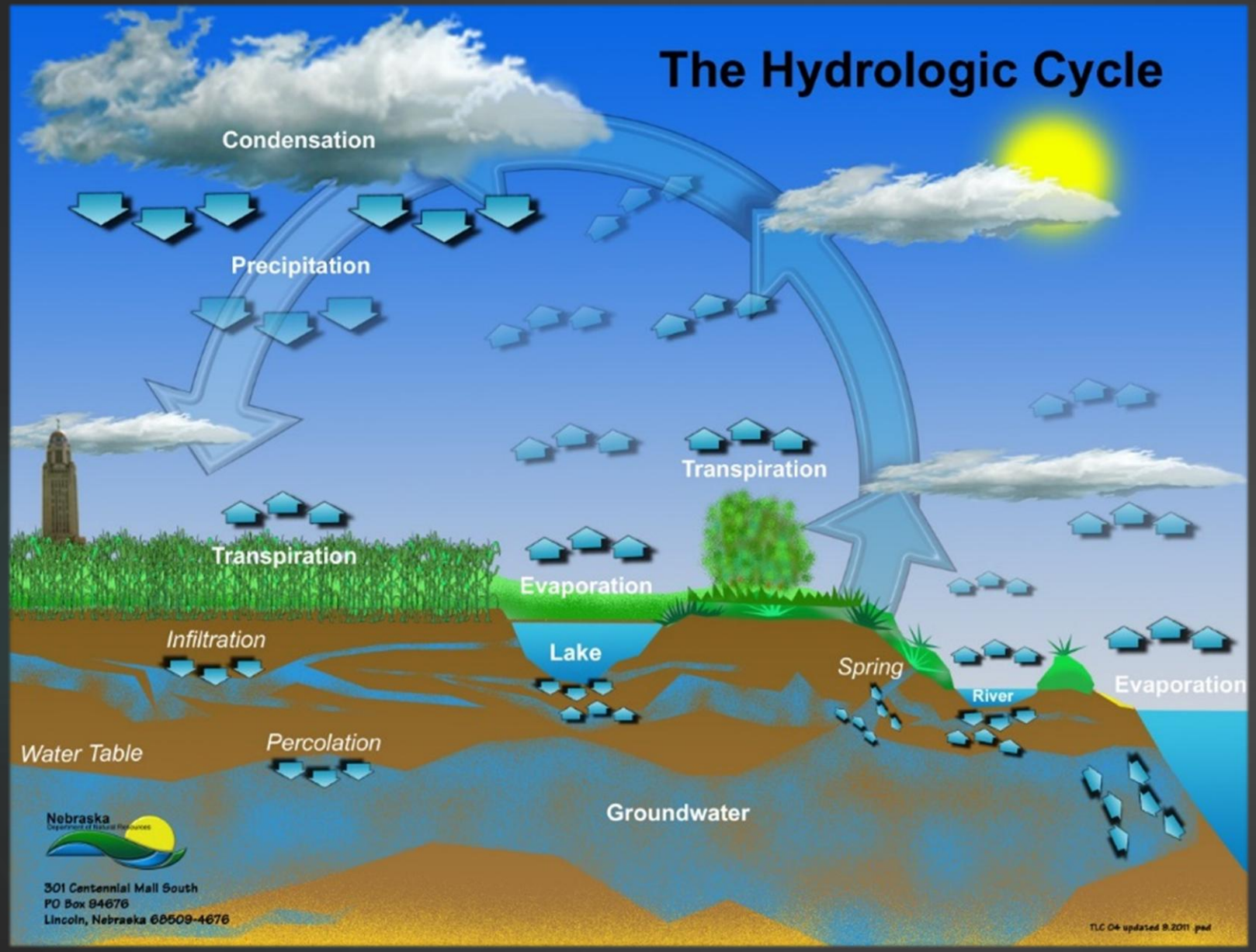
EXTENSION

Water & Wastewater Education 101…

- What is groundwater and where does it come from?
- What makes a good water well?
- What makes a good wastewater system?
- Components of a septic tank and drainfield.
- Components of a well & pumping system and how it operates.
- The importance of well & wastewater system records.
- Testing a well for contaminants.
- Abandoned Wells.
- Well & wastewater system maintenance.
- Chemical and Medication Use/Storage/Disposal.

N EXTENSION

Where does groundwater recharge come from?



There's No New Water!

- Nebraska's groundwater is predominantly recharged from precipitation and snowmelt.
- Limiting contamination and depletion are two of the highest concerns for the High Plains/Ogallala Aquifer.

N EXTENSION

Groundwater Basics

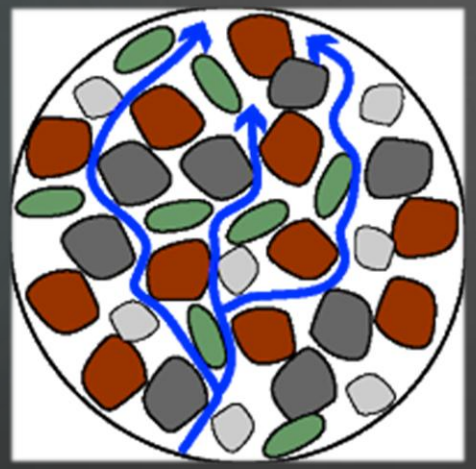
POROSITY:

The measure of the open space/voids between the solid material(s) – the space between grains, cracks, or cavities of a rock, sand, gravel, clay, etc.

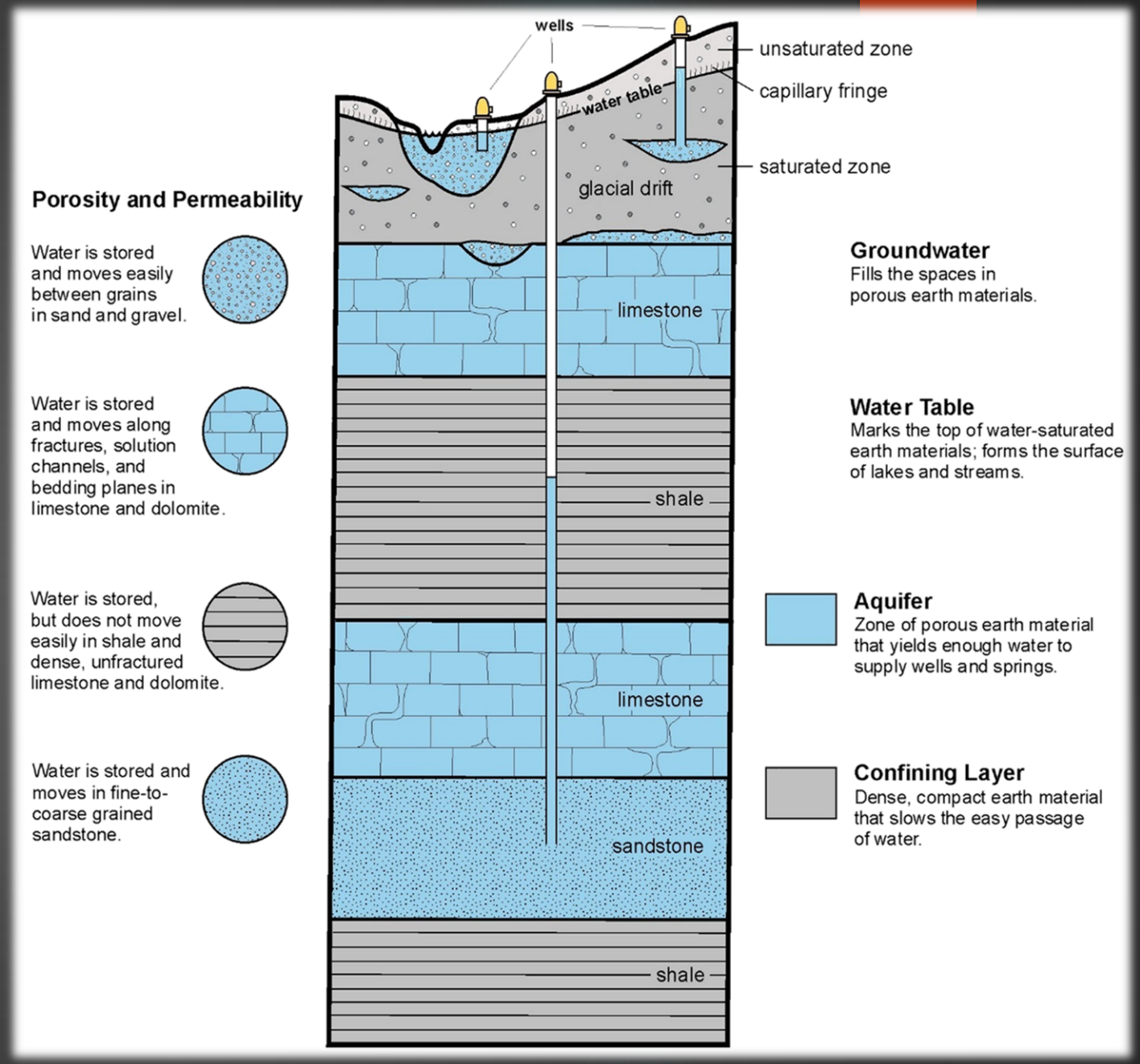
PERMABI LITY:

The measure of the ease that water flows through a porous material – rock, sand, gravel, clay, etc.

*A rock maybe very porous, but if the spaces/voids are not interconnected, it is not permeable.



Groundwatergeek.com/groundwater/porosity



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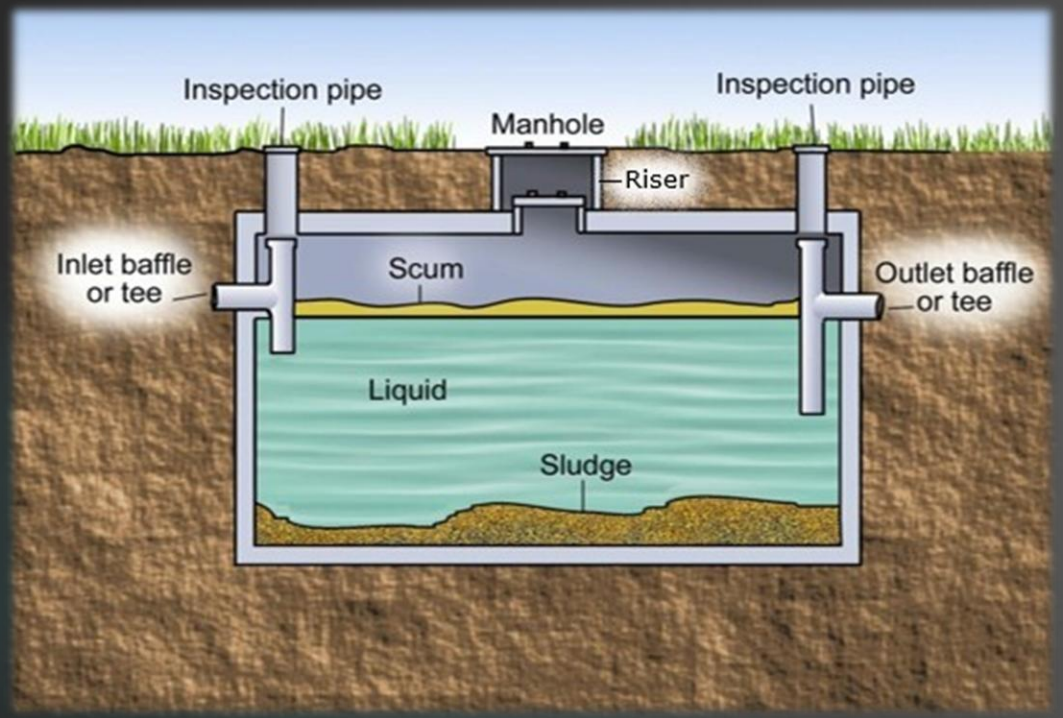
What makes a "Good Septic System?"

- Protection of surface water and groundwater quality in the immediate vicinity of the proposed onsite wastewater system site.
- Onsite septic systems installed on or after the effective date of the most current set of regulations, 06/27/2022 must meet or surpass the state regulations, Title 124, Rules & Regulations for the Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems.

Septic Tanks

- **Nebraska Title 124 regulations** require that a dwelling with three or fewer bedrooms must have at least a 1,000-gallon tank, with an additional 250 gallons for each additional bedroom. For example, a four-bedroom home would require at least a 1,250-gallon tank.
- Only a Nebraska certified installer, registered environmental health specialist, professional engineer, or someone under their direct supervision may install a septic tank.

How a Septic Tank Works



- Wastewater flows from the building sewer line to the septic tank where both heavy and light solids separate from the wastewater.
- Solids that are heavier than water settle out forming a sludge layer on the bottom of the septic tank.
- Solids lighter than water float to the top of the wastewater forming a scum layer.
- A liquid layer of water with suspended solids, nutrients, microorganisms and other pollutants separates the sludge and scum.
- Anaerobic bacteria — those that can live without oxygen — begin to break down waste in the septic tank.

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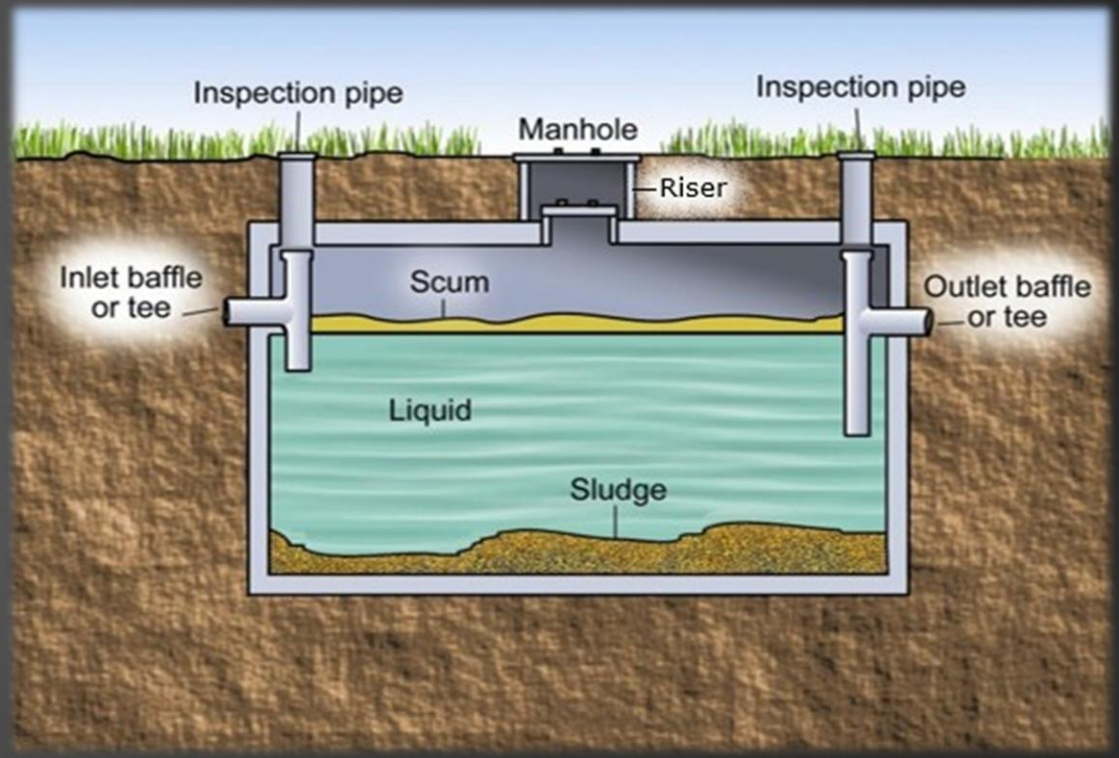
How a Septic Tank Works Cont.

- In a properly designed, functioning and maintained septic tank, scum and sludge will not flow out with the effluent.
- While septic tank effluent may appear clear, microorganisms such as bacteria and viruses, nutrients such as nitrate and phosphorous, dissolved materials and very small particles of suspended solids are present.
- To protect the environment and human health, effluent must receive additional treatment, typically in the Drainfield, or an alternative effluent treatment component such as a Mounds System.
- As wastewater flows into the septic tank, an equal volume of the liquid layer, called effluent, flows out of the septic tank into the effluent treatment system.



Septic Tank Maintenance Responsibilities

Pump it regularly

- Ask for a record from the pumper on what was done/found during pumping.
- Pumping may need to happen annually, though every 2-3 years is common.
- No, Rid-X CANNOT replace septic tank pumping & WILL NOT solve your septic tank problems!

Tank integrity Inspection

- Inspect ports & manhole cover for damage.
- Inspect ground above & around for any depressions or areas retaining stagnate water.
- Have a professional inspect to assure baffles are not damaged – this can be requested at the time of pumping.

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Drainfield Management Responsibilities

Regardless if a Lateral System or Mounds System, the same rules apply:

- Vehicles and other heavy objects kept from drainfield;
- Animal confinement areas not located over drainfield;
- No sidewalks, drives, patios located over drainfield;
- No buildings located over drainfield; and
- Perennial grass cover maintained over drainfield.

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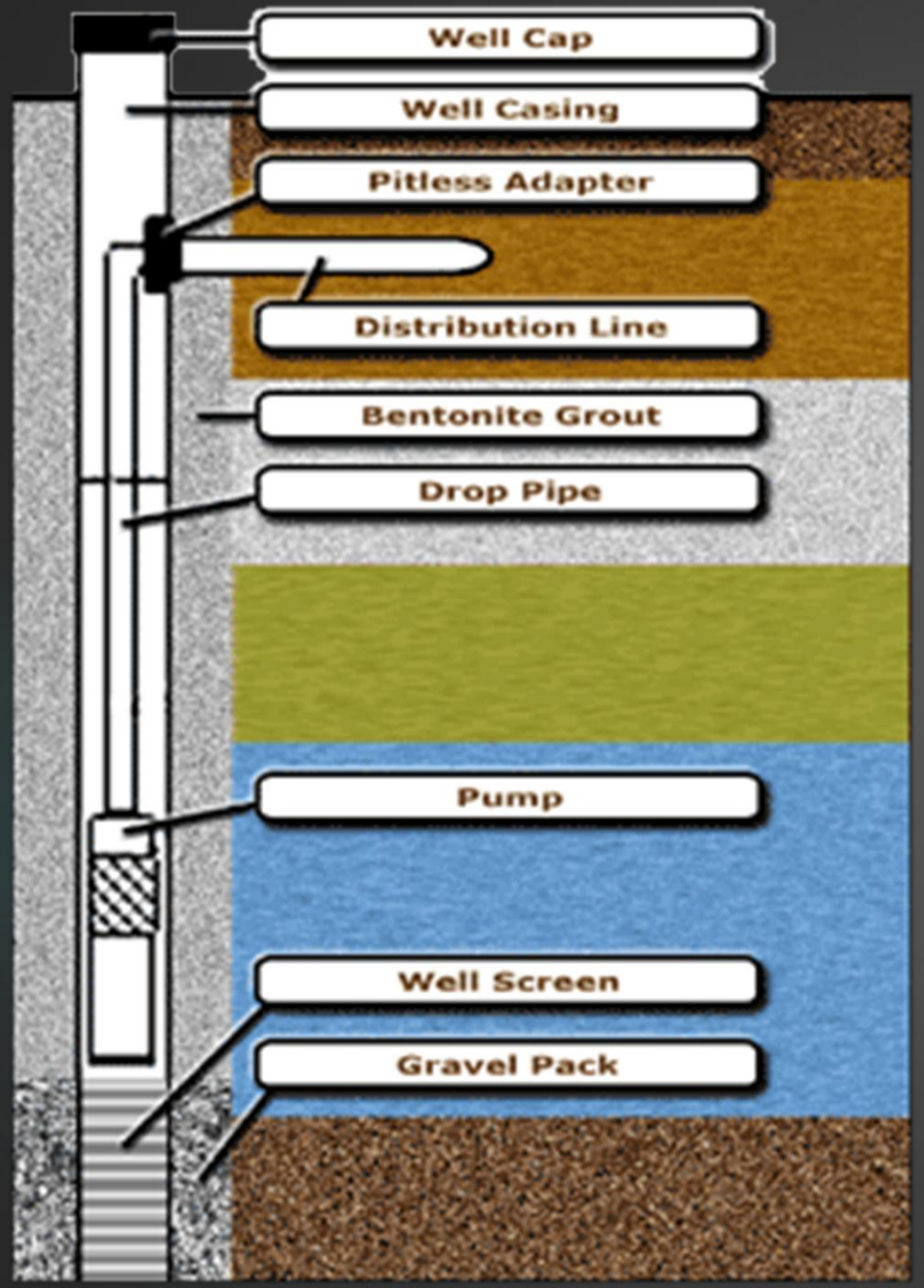
Lagoon Maintenance Responsibilities

- Keep fence around the lagoon intact and maintained;
- Keep grass on berm mowed;
- Don't allow trees to grow on the berm or in the lagoon; and
- Keep vegetation in lagoon managed to allow good airflow and sunlight to reach the water surface.

What makes a "Good Well?"

- The well must provide protection to the groundwater from surface contaminates and meet or surpass the state regulations, Title 178, NAC 12 – Water Well Construction, Pump Installation, and Water Well Decommissioning Standards.
- Well design must be sufficient for efficient use and deliver sand free water.
- The pump must be installed properly to protect the health and welfare of humans and animals consuming the water.



Components of a Drilled Water Well

- Bore hole
- Well Casing
- Well Screen
- Gravel Pack
- Annular Fill
- Primary & Surface Seals
- Well Cap (Sanitary Well Seal)

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Bore Hole

Designed to:

- Allow for the insertion and proper placement of the well casing.
- Provide the required annular space for effective seals, stabilizers, and annular fill to be placed.

Well Casing

Designed to:

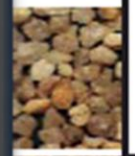
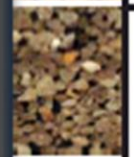
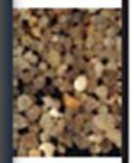
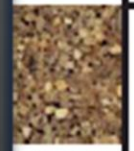
- Allow water to be pumped up from the screened aquifer to the surface;
- Support the pump and pumping equipment;
- Keep dirt, other debris, and contaminants out of the well;
- Resist corrosion and collapse;
- Provide connection to the well screen;
- Provide a water tight seal from the ground surface to the screened area entrance;
- Provide a structure for bore hole seals to adhere too and annular fill to sit up against; and
- Watertight casing must be constructed of steel, PVC, fiberglass, or Teflon and must be manufactured expressly for water well casing.

Title 178 NAC 12-003.04

Well Screen & Gravel Pack

Designed to:

- Well Screen allows water to enter into the casing;
- Gravel Pack must consist of clean sand 0r gravel of a selected size according to the portion of the aquifer to be screened.
- It stabilizes the aquifer material and filters out the debris from the water bearing formation, which in turn helps to protect the pumping equipment;
- The screen also provides access to the aquifer, giving the ability to clean the aquifer if necessary.

Sand / Slot Size Gauge						
Gauge	Name	Natural Development Slot		Filter Pack	Filter Pack Slot	
		Inches	mm	sieve	Inches	mm
	Gravel	0.125	3.2	3/8" - 3/4"	0.250	6.4
	Sand - Coarse	0.100	2.5	4 - 3/8"	0.160	4
		0.080	2	3 - 6	.0120	3.0
	Sand - Medium	0.060	1.5	4 - 8	0.090	2.3
		0.040	1	6 - 12	0.070	1.8
	Sand - Fine	0.020	0.5	10 - 20	0.040	1.0
		0.007	0.2	20 - 40	0.018	0.45

Title 178 NAC 12-003.05

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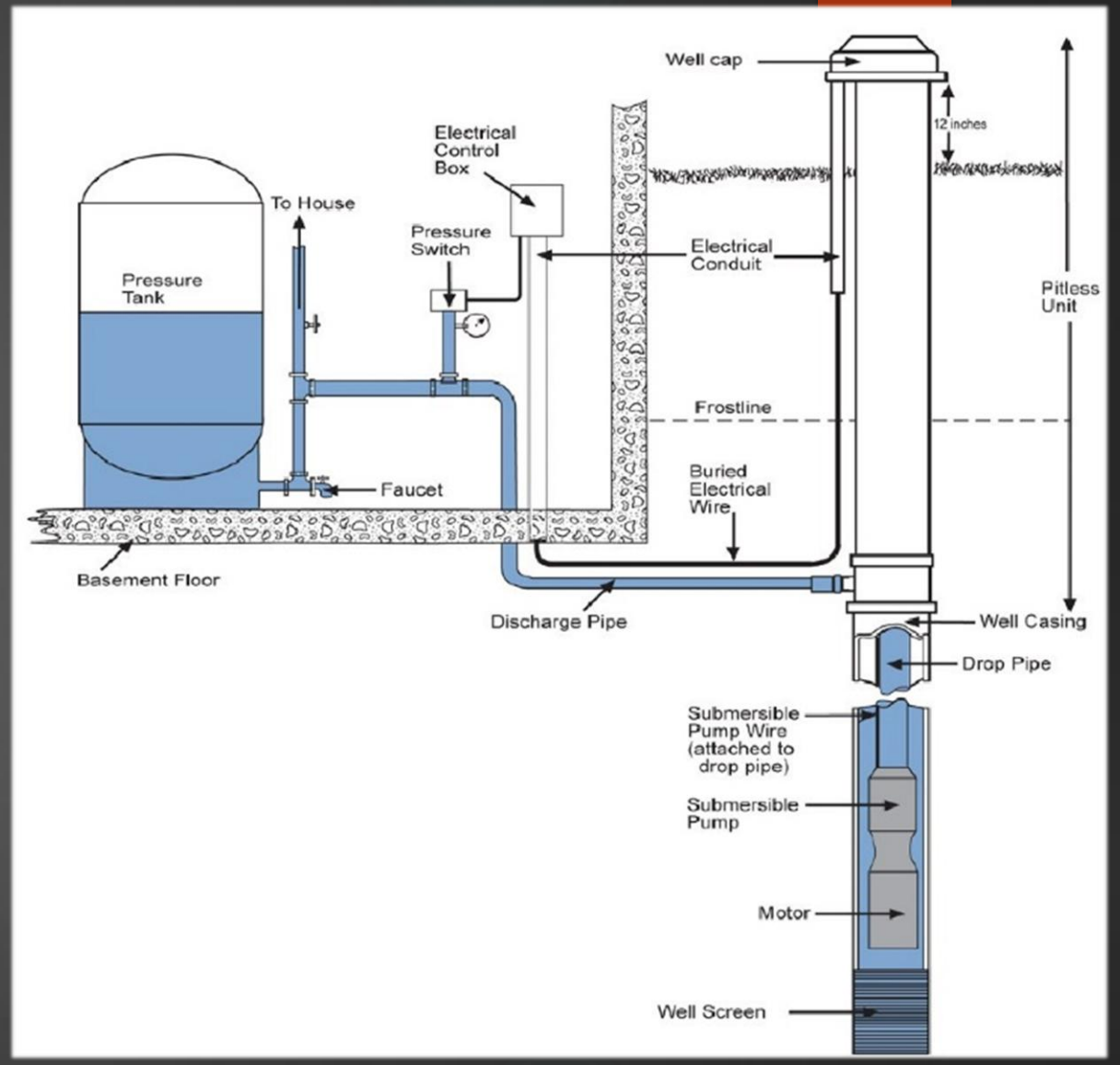
Annular Space – Annular Fill & Seals

- This is the area between the borehole wall and the well casing;
- In Nebraska, the annular space has to be 2" or more around the circumference of the well casing;
- Once filled, it provides support for the well casing;
- Is comprised of layers of non-slurry or high solids bentonite grout mixtures, sand and granular bentonite mixture, or cement based grouts in accordance with Title 178, NAC12.003.08B;
- Primary and Surface Seals within the annulus to protect the water bearing formations from contamination from surface runoff and subsurface contaminants.

Pump Components

Submersible Pumps:

- Higher capacity (up to 1000's of gpm);
- Higher pressure output;
- Mechanically pretty simple;
- Various seal options, including the most common, pitless unit;
- Since pushing water takes less energy, submersible pumps are often more efficient for use with deeper wells;
- Average life of a submersible pump is 20-25 years;
- A Variable Frequency Drive (VFD) controller adjusts the speed of the pump to depending household demand by adjusting water flow/pressure. Wear and tear on the pump & power consumption is also reduced.



Title 178 NAC 12-011.02B

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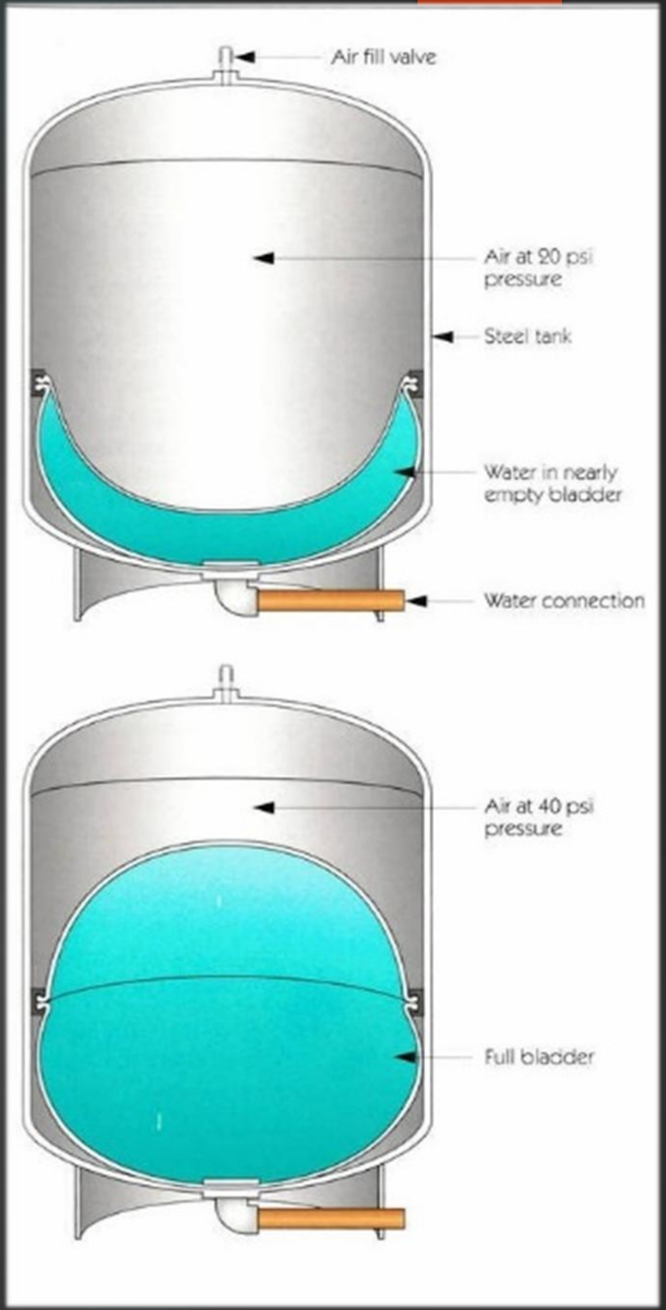
The Pressure Tank

- Stores water under pressure so that the pump doesn't have to run every time water is needed.
- Water is contained in a vinyl or neoprene bladder, separated from the air in the tank.
- The tank is pressurized by an air fill valve on the top, just like the air valve stem on a tire.
- In the pictured example: by pre-pressurizing the tank to 20 psi and setting the pressure switch of the pump to 20-40 psi, the volume per pump cycle can be maximized at roughly half the volume of the tank.

Info & graphic from "A Guide to Well Water in Southern Connecticut"



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Well Development

Development is critical to removing blockage from the drilling process.

- Helps to remove fines and drilling additives from the drilling process that remain in the bore hole that could create blockages. Thus improving the porosity and maximizing well yield.
- It optimizes the filter capacity of the gravel pack around the screen.
- Safe water quality.
- Over pumping and surging are two of the most common ways to develop a domestic well.

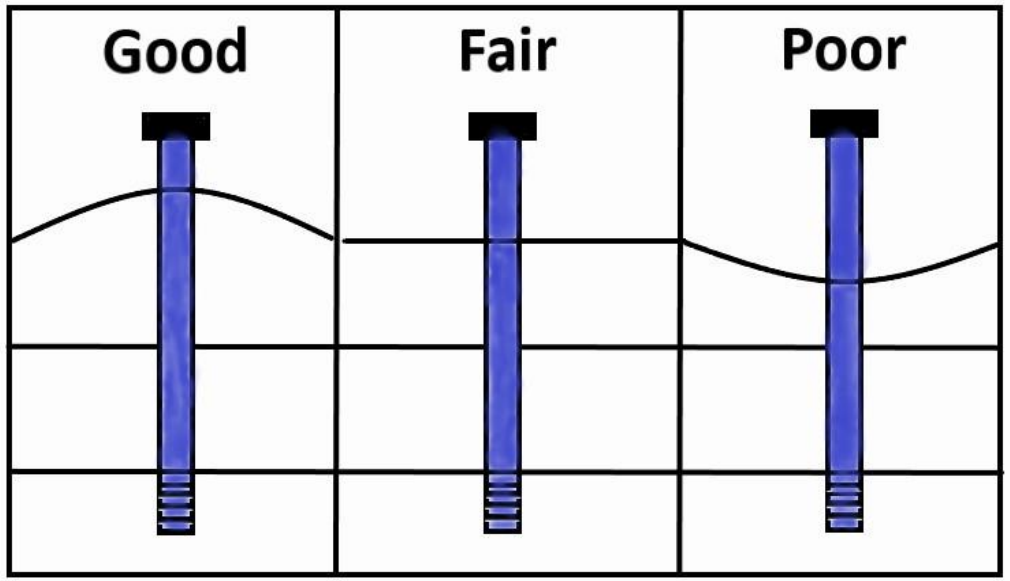
Water Well Secure Cover

- A cover on the top of a well casing that will prevent debris, bugs, critters, or any contamination from getting into the well.
- In Nebraska this means a welded, solvent welded, treaded, or bolted watertight cover that is secured as to prevent the removal without using tools.

N EXTENSION

Above ground finish of well head

- Well head is at least 12" above grade.
- Ground is sloped away from well head.
- Well head is not vulnerable to flooding or contamination.



What to Test Private Wells for?

Private well owners should always test for:

1. Bacteria (Coliform by Quantitray)
2. Nitrate

- Use tables from "Drinking Water Treatment, an Overview" NebGuide to identify other possible water quality parameters to test for; and
- Check with your local NRD or Health Department for any contaminants of concern in your area.
- Follow all sample kit instructions carefully and fill out paperwork completely.

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Where to have water tested…

Drinking water from private wells is just as important as water from Public Water Systems. For this reason it is recommended that drinking water samples from private wells be tested at an Certified Laboratory:

Central District Health Department: *Total Coliform/E.coli*

Enviro Services Inc.: *Total Coliform/E.coli*

Metropolitan Utilities Districts: *Total Coliform/E.coli*

Midwest Laboratories: *Total Coliform/E.coli, Nitrate, Nitrite, Copper, Lead, VOCs, Fluoride*

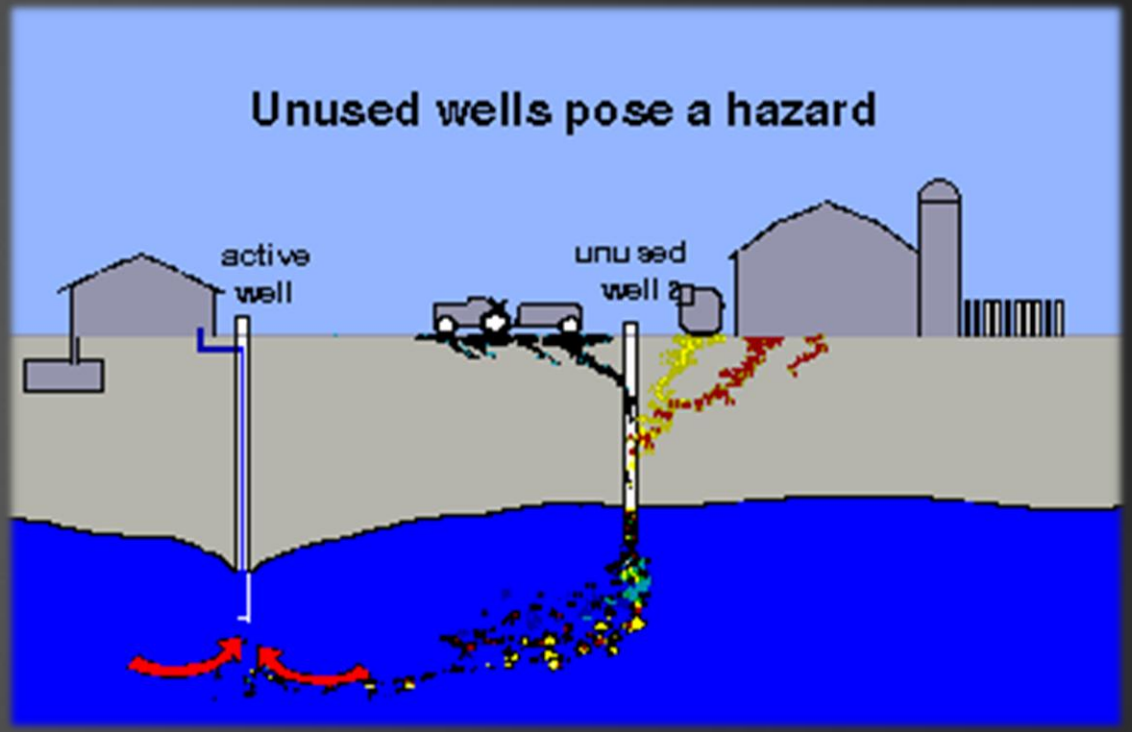
American Agricultural Laboratory: *Total Coliform/E.coli, Nitrate/Nitrite*

NDHHS Public Health Environmental Lab: All of the above + many more ~ *Nebraska's Accrediting Laboratory*

N EXTENSION

Abandoned Wells

- Abandoned wells are a potential liability and can be a direct conduit to the aquifer below.
- Many of the NRDs throughout Nebraska offer a cost-share program for decommissioning water wells. It is worthwhile checking with your local NRD to find out more about their decommissioning cost share program.
- A Nebraska licensed Water Well Contractor should be hired to properly decommission any water well in accordance with Nebraska State Regulations, Title 178 NAC 12.



Responsibilities of Private Well Owners

- All private wells, regardless of type need to have contamination kept away from the wellhead area;
- Ground around your wellhead needs to be sloped away from it to aid in shedding water and potential contaminants away; and
- Inspect your well head annually, making sure everything is intact. If anything appears to be broken or cracked, contact your licensed water well contractor to investigate to be sure no other damage exists and to make the necessary repairs.
- Make sure landscaping is not sloped toward your wellhead. You want to keep any runoff that may come from landscaping and/or house/building roofs away from your wellhead.

Conserving Our Groundwater Resources…

Conservation practices can have a big impact on our groundwater resources as well as savings for the consumer in the way of lower utility bill(s):

- Check & maintain all faucets, taps and water using appliances inside & outside your home;
- Fix any leaks or valves that won't shut off completely;
- Install water wise appliances such as low-flow shower heads, toilets, dish washers, clothes washers and sprinkler heads;
- Mulch plants, water lawns/gardens in the early-mid morning hours & only water when root zone moisture is needed; and
- Choose landscape plants and lawn/turf options that are drought tolerant. Native plants are great choices and are usually very drought and cold hardy.

N EXTENSION

Chemicals and Medication: Use, Storage, & Disposal

- Always follow manufacturers application/use directions;
- Store according to manufacturers instructions; and
- Dispose of excess or outdated products at a local Hazardous Waste Center or Medicine Disposal site.

Keep Nebraska Beautiful:
https://www.knb.ort/waste-programs/household-hazardous-waste

Nebraska MEDS Coalition:
https://nebraskameds.org

5 Simple Tips on Well and/or Onsite System Maintenance and Responsibilities

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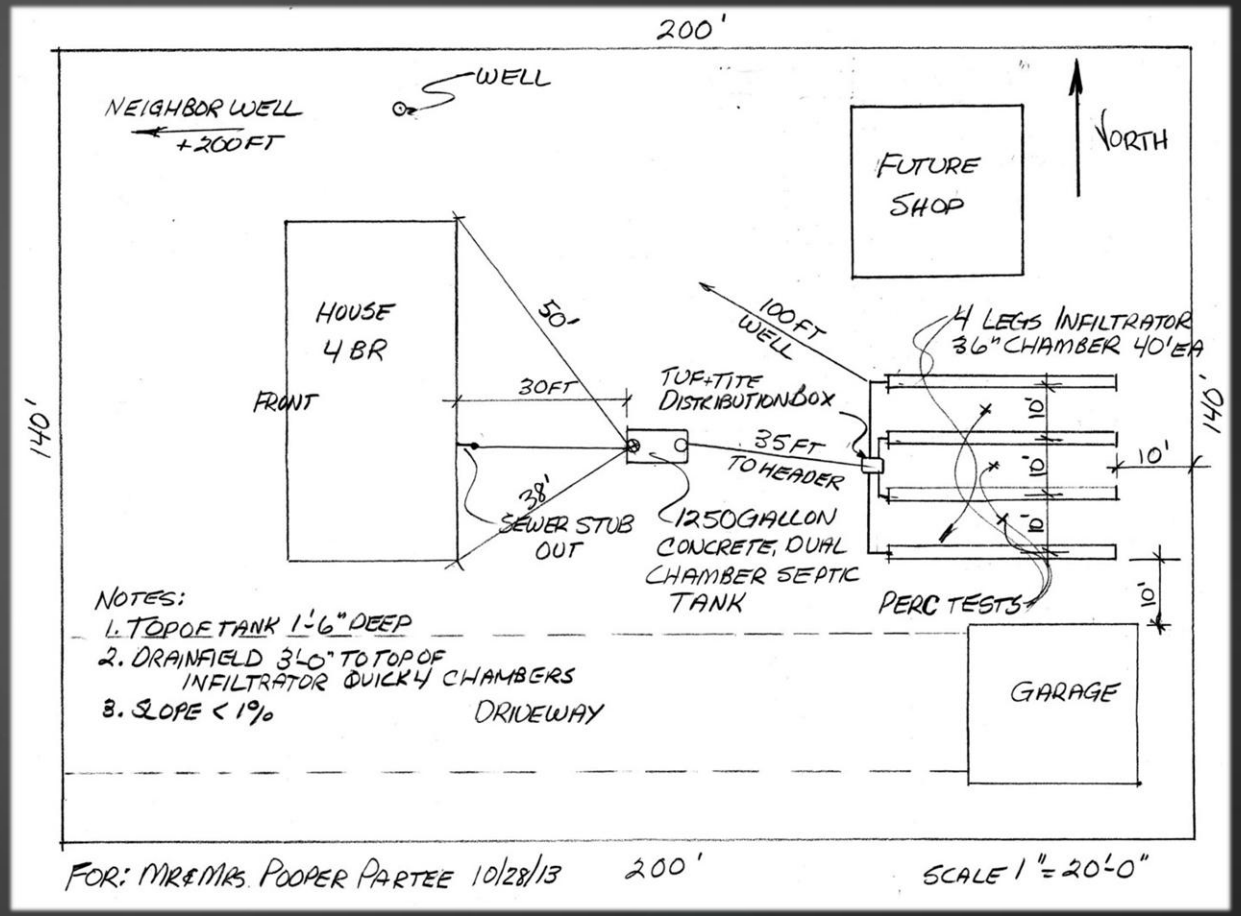
1. Create a map of the property marking the house, property lines, well, septic tank, drainfield, out buildings, and distances between said points.

This is important for:

- Tank and drainfield location for system inspection, pumping, or repair;
- Future addition of a structure or permanent feature such as a pool to the existing property;
- Running new water or septic lines;
- Well replacement;
- Landscaping; and
- Property sale.

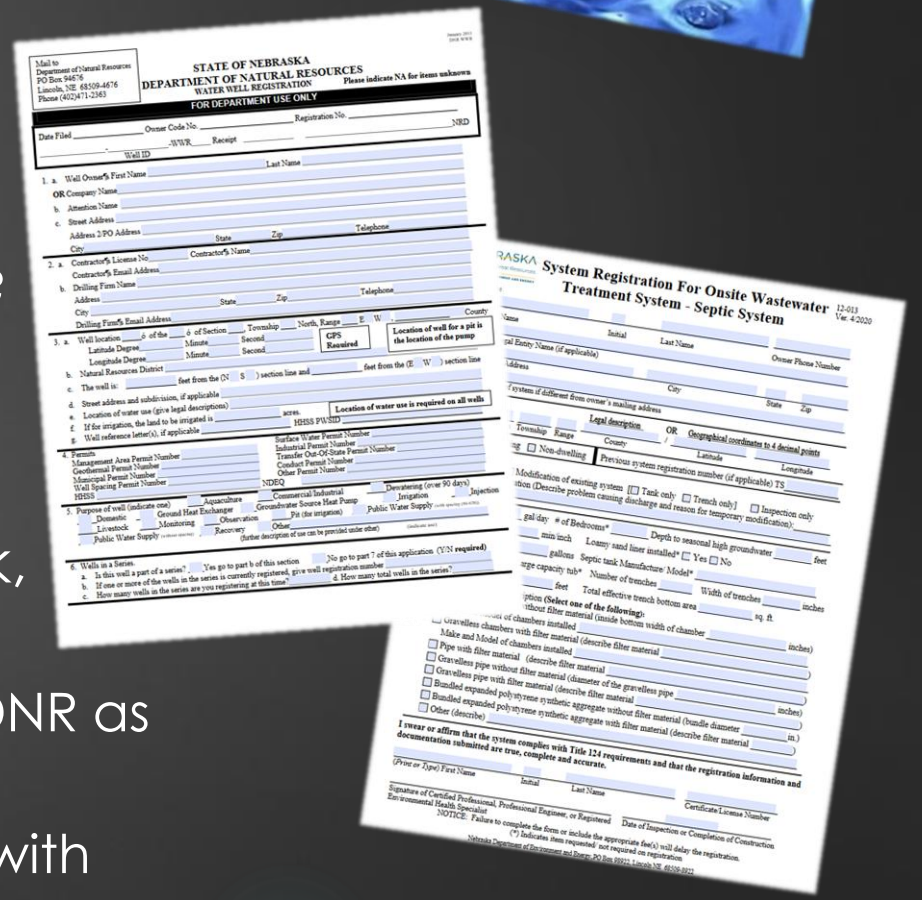


2. Well Drilling and Onsite Installation Contractors info:

- Business /Contractor's name.
- Contact information – address, phone number, email, website, etc.

3. Permit and/or Registration information:

- Who was the original permit/registration issued to?
- The date it was permitted/registered.
- Legal description of the property.
- GPS of the well location and onsite location – tank, laterals, etc.
- All wells must be registered & updates made with the DNR as of 9/01/1993.
- All onsite systems must be registered & updates made with NDEE as of 1/01/2004.



4. Well & Onsite Records

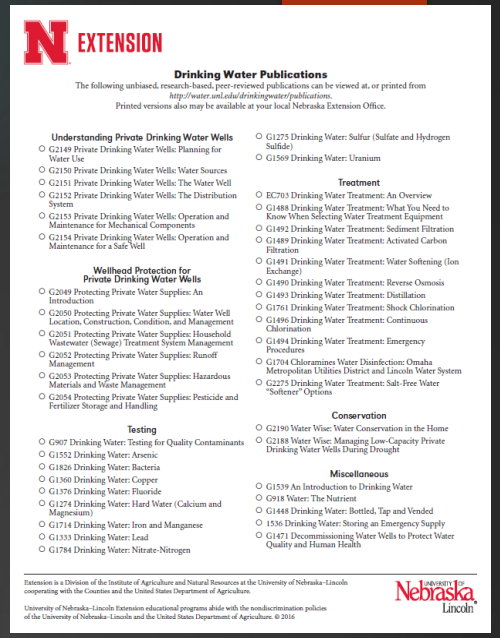
- Copy of the well/onsite registration, and any manuals & receipts of repair should be kept together in a safe place.
- If the property is sold, a change of ownership of the well must be filed with the DNR within 60 days of the sale. All well records should be given to the new owner.
- Any well on a property that is decommissioned must be reported to DNR regardless of date of construction.
- https://dnr.nebraska.gov
- If there's an Effluent Dispersal System/Drainfield, the following should be in your records:
  - Lateral lines (length and location)
  - Distribution or drop box location
  - motors/electrical components
  - Engineered system – include engineer contact info

N EXTENSION

5. Educative resources:

Go to water.unl.edu

- Click on the header titled: *Residential Water Use*, here you will find sections on *Drinking Water* and *Water Wells* and *Wastewater*.
- You will also find sections on *Lawns, Gardens & Landscapes* and *Stormwater Management*.
- The NebGuides on all of the topics are available to use/print ***free of charge*** from Nebraska Extension and the College of Agriculture & Natural Resources.



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Drinking Water Publications

The following unbiased, research-based, peer-reviewed publications can be viewed at, or printed from *http://water.unl.edu/drinkingwater/publications*.
Printed versions also may be available at your local Nebraska Extension Office.

Understanding Private Drinking Water Wells
- G2149 Private Drinking Water Wells: Planning for Water Use
- G2150 Private Drinking Water Wells: Water Sources
- G2151 Private Drinking Water Wells: The Water Well
- G2152 Private Drinking Water Wells: The Distribution System
- G2153 Private Drinking Water Wells: Operation and Maintenance for Mechanical Components
- G2154 Private Drinking Water Wells: Operation and Maintenance for a Safe Well

Wellhead Protection for Private Drinking Water Wells
- G2049 Protecting Private Water Supplies: An Introduction
- G2050 Protecting Private Water Supplies: Water Well Location, Construction, Condition, and Management
- G2051 Protecting Private Water Supplies: Household Wastewater (Sewage) Treatment System Management
- G2052 Protecting Private Water Supplies: Runoff Management
- G2053 Protecting Private Water Supplies: Hazardous Materials and Waste Management
- G2054 Protecting Private Water Supplies: Pesticide and Fertilizer Storage and Handling

Testing
- G907 Drinking Water: Testing for Quality Contaminants
- G1552 Drinking Water: Arsenic
- G1826 Drinking Water: Bacteria
- G1360 Drinking Water: Copper
- G1376 Drinking Water: Fluoride
- G1274 Drinking Water: Hard Water (Calcium and Magnesium)
- G1714 Drinking Water: Iron and Manganese
- G1333 Drinking Water: Lead
- G1784 Drinking Water: Nitrate-Nitrogen
- G1275 Drinking Water: Sulfur (Sulfate and Hydrogen Sulfide)
- G1569 Drinking Water: Uranium

Treatment
- EC703 Drinking Water Treatment: An Overview
- G1488 Drinking Water Treatment: What You Need to Know When Selecting Water Treatment Equipment
- G1492 Drinking Water Treatment: Sediment Filtration
- G1489 Drinking Water Treatment: Activated Carbon Filtration
- G1491 Drinking Water Treatment: Water Softening (Ion Exchange)
- G1490 Drinking Water Treatment: Reverse Osmosis
- G1493 Drinking Water Treatment: Distillation
- G1761 Drinking Water Treatment: Shock Chlorination
- G1496 Drinking Water Treatment: Continuous Chlorination
- G1494 Drinking Water Treatment: Emergency Procedures
- G1704 Chloramines Water Disinfection: Omaha Metropolitan Utilities District and Lincoln Water System
- G2275 Drinking Water Treatment: Salt-Free Water "Softener" Options

Conservation
- G2190 Water Wise: Water Conservation in the Home
- G2188 Water Wise: Managing Low-Capacity Private Drinking Water Wells During Drought

Miscellaneous
- G1539 An Introduction to Drinking Water
- G918 Water: The Nutrient
- G1448 Drinking Water: Bottled, Tap and Vended
- 1536 Drinking Water: Storing an Emergency Supply
- G1471 Decommissioning Water Wells to Protect Water Quality and Human Health

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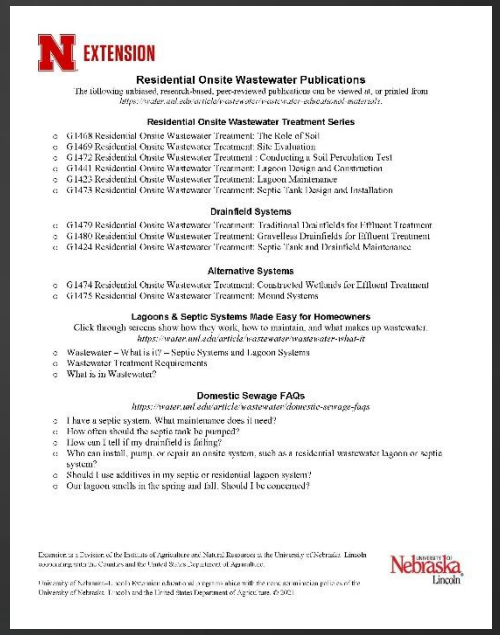

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Residential Onsite Wastewater Publications

The following unbiased, research-based, peer-reviewed publications can be viewed at, or printed from *https://water.unl.edu/article/wastewater/residential-wastewater-educational-materials*.

Residential Onsite Wastewater Treatment Series
- G1468 Residential Onsite Wastewater Treatment: The Role of Soil
- G1469 Residential Onsite Wastewater Treatment: Site Evaluation
- G1472 Residential Onsite Wastewater Treatment : Conducting a Soil Percolation Test
- G1441 Residential Onsite Wastewater Treatment: Lagoon Design and Construction
- G1423 Residential Onsite Wastewater Treatment: Lagoon Maintenance
- G1473 Residential Onsite Wastewater Treatment: Septic Tank Design and Installation

Drainfield Systems
- G1479 Residential Onsite Wastewater Treatment: Traditional Drainfields for Effluent Treatment
- G1480 Residential Onsite Wastewater Treatment: Gravelless Drainfields for Effluent Treatment
- G1424 Residential Onsite Wastewater Treatment: Septic Tank and Drainfield Maintenance

Alternative Systems
- G1474 Residential Onsite Wastewater Treatment: Constructed Wetlands for Effluent Treatment
- G1475 Residential Onsite Wastewater Treatment: Mound Systems

Lagoons & Septic Systems Made Easy for Homeowners

Click through screens show how they work, how to maintain, and what makes up wastewater.
https://water.unl.edu/article/wastewater/wastewater-what-it
- Wastewater – What is it? – Septic Systems and Lagoon Systems
- Wastewater Treatment Requirements
- What is in Wastewater?

Domestic Sewage FAQs

https://water.unl.edu/article/wastewater/domestic-sewage-faqs
- I have a septic system. What maintenance does it need?
- How often should the septic tank be pumped?
- How can I tell if my drainfield is failing?
- Who can install, pump, or repair an onsite system, such as a residential wastewater lagoon or septic system?
- Should I use additives in my septic or residential lagoon system?
- Our lagoon smells in the spring and fall. Should I be concerned?

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Well & Septic Owner's Check List

- Inspect your wellhead and area around it in the spring and fall. Perform maintenance as necessary:
  - ☐ Keep sources of contamination away from it.
  - ☐ Make sure your wellhead is at least 12" above grade and the ground around it is sloped away with no depressions where water can sit stagnant.
  - ☐ Keep tree plantings away from your well and water line locations.
  - ☐ Check all hydrants, faucets, and water pipes to make sure none are leaking, busted from being frozen over the winter or run ove.
  - ☐ Properly fix, and if necessary, winterize in the fall.
- At the same time, inspect your onsite septic system. If a Lateral System or Mounds System, the same rules apply:
  - ☐ Vehicles and other heavy objects kept from drainfield;
  - ☐ Animal confinement areas not located over drainfield;
  - ☐ No sidewalks, drives, patios located over drainfield;
  - ☐ No buildings located over drainfield; and
  - ☐ Perennial grass cover maintained over drainfield.
- If a lagoon system:
  - ☐ Keep fence around the lagoon intact and maintained;
  - ☐ Keep grass on berm mowed;
  - ☐ Don't allow trees to grow on the berm or in the lagoon; and
  - ☐ Keep vegetation in lagoon managed to allow good airflow and sunlight to reach the water surface.
- Inspect water treatment systems making sure they are not leaking and operating properly.
- Review recommended maintenance procedures and filter/media replacement for water equipment according to the manufacturer's specifications. This includes water softeners, filtration systems, and water heaters. Water heaters should be drained/flushed annually.
- Test for Nitrates & Coliform bacteria annually.
- Be aware of other possible contaminants of concern in your area. Your local NRD, health department, or nearby community water supply can be great sources for this information.
- If in doubt about issues, contact your licensed water well contractor or certified onsite wastewater professional to make the necessary repairs.

Compliments of the Domestic Water/Wastewater Management Program
Becky Schuerman / 402-441-7180 / bschuerman3@unl.edu

N EXTENSION

Rev. 6/2025

N EXTENSION

Transfer of Ownership Upon the Sale of a Property or the Death of an Owner

Onsite Wastewater Treatment System Permits

Title 124 – Rules and Regulations for the Design, Operation and Maintenance of Onsite Wastewater Treatment Systems:

Chapter 3, allows transfer of ownership of an onsite wastewater treatment system automatically, but obligates the new owner to operate under the existing permit with the same obligations and conditions that applied to the previous owner.

Verbiage from Regulation:

008 Transferability of Permits and Coverage under General Permits 008.01 Any transfer of ownership of a permitted system or system covered under a general permit will automatically authorize the new owner to operate under the existing permit or general permit.

008.02 A subsequent owner is under the same obligations and conditions of the permit or general permit as was the original or previous owner.

N EXTENSION

Transfer of Ownership of a Well

This goes for any type of water well – domestic, livestock, irrigation, and monitoring/observation.

Go to: https://dnr.nebraska.gov/groundwater/forms

- Changes of ownership is to occur within 60 days of the property transfer.

- If a previous or several previous owners didn't update the ownership the previous landowner does not need to complete Section 3 of the form.

Here's how to proceed:

- Section 1: New Owner Information
  The new owner (individual or entity such as a business, LLC, or Trust) must list their name as it appears on the county assessor's site or the warranty deed. This should be the legal name of the owner or entity. This also includes address.
- Other Sections
  Section 3 can be left blank. Complete the rest of the form as required. This may include additional information about the property and well.

N EXTENSION

Reporting the Decommissioning of a Well

12-012.10 Reporting Decommissioning:

A notice of decommissioning for all water wells except test holes must be submitted to the Director of the Department of Natural Resources on the Notice of Decommissioning form supplied by the Department of Natural Resources within 60 days of the decommissioning of the water well as required in Neb. Rev. Stat. § 46-602 as follows:

1. The pump installation contractor or water well contractor must submit written notice of the decommissioning of a water well to the Department of Natural Resources.
2. If both a water well contractor and a pump installation contractor are involved in the decommissioning of a water well, the pump installation contractor must submit the notice of decommissioning to the Department of Natural Resources.
3. If a landowner decommissions a driven sandpoint water well on land owned by him/her and used by him/her for farming, ranching, or agricultural purposes or as his/her place of abode, the landowner must report the decommissioning to the Department of Natural Resources.

Livestock Waste Permits

Title 130 – Livestock Waste Control Regulations

Chapter 6 authorizes the transfer of a construction and operating permit, construction approval, operating permit or NPDES permit issued under Title 130. Title 130-issued permits require submission of a completed Applicant Disclosure form (Appendix C), completed by the new owner or operator, and a Transfer Request form (Appendix D), signed and dated by the current authorized representative, and the authorized representative for the proposed owner or operator at least 30 days prior to the proposed transfer. The transfer is effective only upon written approval by the NDEE Director.

Verbiage from Regulation:

003 A construction and operating permit, construction approval, operating permit or NPDES permit may be transferred to another person. A completed transfer request form shall be submitted to the Department at least 30 days prior to the proposed transfer. The transfer is complete only upon written approval by the Director.

The transfer request shall include the following:

003.01 A completed transfer form (see Appendix D), signed and dated by the current authorized representative and the authorized representative for the proposed owner or operator.

003.02 An applicant disclosure form, (see Appendix C), completed by the new owner or operator.

N EXTENSION

Livestock Waste Control Program Contact Information:

Agriculture Section	Lincoln:	(402) 471-4239
Field Offices:	Holdrege:	(308) 991-1780
	North Platte:	(308) 530-0874
	Scottsbluff:	(308) 765-9293

https://dee.nebraska.gov/land-waste/agriculture/livestock-waste-control-program


We forget that the water cycle
and the life cycle are one
JACQUES YVES COUSTEAU

EXTENSION

Any Thoughts or Questions?

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