DEPARTMENT OF PUBLIC HEALTH
219 East Market Street P.O. Box 1503 Lima, Ohio 45802-1503
Phone (419) 228-4457 Fax (419) 224-4161
www.allencountyhealthdepartment.org
Info Line (419)228 - INFO (4636)

Public Health
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PRIVATE WATER SYSTEM RULES CHAPTER 3701-28-07
ABANDONMENT OF WELLS, TEST HOLES, & CISTERNS

A. Upon completion of testing, a test hole shall either be permanently abandoned, or converted into a well, construction of which shall comply with all applicable requirements of this chapter.

B. All wells that are not in service shall either be sealed in accordance with this rule…or maintained in strict compliance with all applicable requirements of this chapter.

C. All dry holes shall be sealed in accordance with the provisions of this rule.

D. All cisterns and hauled water storage tanks that are permanently out of service shall be emptied of all accumulated water. At least one wall of the cistern or hauled water storage tank shall be removed to prevent the accumulation of water. All entrances and drains into the cistern or hauled water storage tank shall be disconnected and sealed. The cistern or hauled water storage tank shall be completely filled with an inert solid material to prevent collapse, except when the cistern is beneath a dwelling or a part of a dwelling foundation, or is to be converted to a room intended to be used as part of the dwelling.

All wells, dry holes, test holes and boreholes shall be sealed in accordance with the following requirements, as applicable:

1. Remove all equipment such as pumps, pitless adapters, drop pipes, suction lines, trash or other debris. Pumps that cannot be removed shall be pushed to the bottom of the well, if possible, or left in place if it is not possible to push it to the bottom of the well.
2. If possible, the casing and/or liner should be removed, ripped or perforated to allow for sealing of the annular space.
3. The well must be disinfected with a chlorine concentration of 1000 ppm. Where the well is dry, a minimum of 10 gallons of chlorine solution at 1000 ppm shall be prepared and the sides of the casing or borehole shall be rinsed.
4. Grout should be placed from the bottom of the well upwards in one continuous operation using a grout pump and tremie pipe. This prevents premature bridging of the sealing agent, which occurs when pouring the sealing agent into the borehole by gravity.
    a. Cement grouts must be pressure grouted. Cement based grouts may be gravity pouted into a dry hole where no water is present in the well or borehole.
        i. Type I, II, IV and V cement - add 6 gallons of water per 94-pound bag of cement.
        ii. Type III cement – add 6.3 to 7 gallons of water per 94-pound bag of cement.
        iii. Concrete - add 94 pounds of cement, an equal amount of sand, and no more than 6 gallons of water.
    b. Bentonite grout slurries must be pressure grouted.
        i. Bentonite based grout slurries shall be mixed according to manufacturers' recommendations to achieve a minimum density of 9.25 to 9.4 pounds per gallon, and a solids content of 25-30% bentonite by weight of water. Synthetic organic polymers that meet ANSI/NSF Standard 60 may be added to bentonite slurries to suppress hydration of the bentonite particles and shall be mixed according to the manufacturer's recommendations.

c. When using course grade or pelletized bentonite, the following requirements must be met:

   i. The total volume of sealing materials must be within 5% of the total volume of the well or dry hole.
   ii. The bentonite shall be poured slowly into the top of the well or dry hole to prevent bridging in the casing or borehole by:

      (a) Pouring over a wire mesh screen to keep the fine bentonite powder from entering the well or dry hole. DO NOT DUMP THE BAG OF BENTONITE DIRECTLY DOWN THE WELL CASING.
      (b) Pouring at a continuous rate no faster than 3 minutes per 50-pounds.
      (c) Using a tamping device where possible to break any bridges that may form; and, lowering a weighted tape measure into the well to determine the top of the sealing products.

5. When the well casing cannot be removed, it must be cut off a minimum of two feet below the finished grade. The well casing must be completely filled with the sealing agent to the point at which the casing is cut off below the ground. After the sealing agent has set up, the excavated hole shall be backfilled with clean soil and mounded to ensure that water drains away from the sealed well. Do not backfill with stone, gravel, or sand.

6. Complete and distribute the enclosed ODNR Water Well Sealing Report. Return the green copy to the Allen County Health Department.

Table Comparing Volumes of Different Well Sealing Materials Required to Seal a 100-Foot Well

Hole Diameter Inches	Gallons Per Foot	Gallons to be Plugged in 100' well	Bags Required to Plug a 100' Well*			Hole Volume Cu Ft/Ft Depth	Feet Filled by One Bag of Holeplug	Bags of Holeplug to Fill a 100' Well	Cu Ft of #8 Aggregate to Fill a 100' Well
			Benseal	Enviroplug	Neat Cement				
2	0.17	17	1	1	2	0.022	31.30	4	2.2
3	0.38	38	2	2	4	0.049	14.30	7	4.9
4	0.67	67	3	3	7	0.087	7.90	13	8.7
5	1.00	100	4	5	11	0.136	5.10	20	13.6
6	1.51	151	5	7	16	0.196	3.50	29	19.6
7	2.05	205	7	10	22	0.267	2.60	39	26.7
8	2.70	270	9	13	28	0.349	2.00	51	34.9
9	3.40	340	11	16	35	0.442	1.60	64	44.2
10	4.20	420	13	19	44	0.545	1.30	79	54.5
11	5.00	500	16	23	52	0.660	1.10	95	66.0
12	6.00	600	19	27	62	0.785	0.89	113	78.5
15	9.50	950	30	43	98	1.227	0.57	177	122.7
18	13.60	1360	42	61	140	1.767	0.39	255	176.7
20	16.80	1680	52	75	173	2.181	0.32	315	218.1
25	26.00	2600	80	117	267	3.409	0.20	491	340.9
30	38.00	3800	117	170	390	4.909	0.14	707	490.9
60	152.00	15200	468	679	1559	20.322	0.04	2500	2032.2

* Number of bags has been rounded up to the next whole bag.

Yield Calculations:

Neat Cement – one 94 lb bag plus 6 gallons of water equals 9.75 gallons of grout.
Benseal – one 50 lb bag plus 10 oz of E-Z Mud plus 30 gallons of water equals 32.5 gallons of grout.
Enviroplug – one 50 lb bag plus 2.5 lb of activator plus 20 gallons of water equals 22.4 gallons of grout.

Holeplug is a granular bentonite product, 3/8"-3/4" in size that is poured, not pumped, into a well.

Table based on product information published by NL Baroid, Wyo-Ben Inc., and Chemgrout, Inc.

The following types of wells and dry holes shall be sealed in accordance with the requirements of OAC 3701-28-071:

1. Dug or bucket-drilled wells or dry holes;
2. Wells and dry holes drilled through single consolidated and unconsolidated aquifers; confined or unconfined unconsolidated aquifers that are not flowing at the surface;
3. Wells and dry holes drilled through multiple consolidated and unconsolidated aquifers;
4. Wells that are flowing; and,
5. Wells and dry holes drilled through fractured or cavernous formations or mine shafts.