

NATURAL RESOURCES CONSERVATION SERVICE
Wyoming
CONSTRUCTION SPECIFICATIONS
FOR
WELL DECOMMISSIONING

(Owner/Operator)

(Project Title)

GENERAL

The well sealing procedure shall be in accordance with a plan approved by the responsible technician. Details of construction shown in the design and plan or described in the State of Wyoming State Engineer's Office "Regulations and In Structures", Part II, Groundwater but not included here shall be considered as a part of this specification. Construction activities shall be in accordance with applicable OSHA regulations.

WELL PREPARATION

Equipment/Debris Removal – Pumping equipment and any obstacles or debris shall be removed from the well before sanitation or sealing procedures begin.

Flushing – Unless otherwise specified the well shall be flushed by pumping in clean water or by use of an air compressor line.

SANITIZATION

The water in the well shall be brought to a 100PPM chlorine concentration before sealing:

A-100 PPM chlorine solution will require one of the following:

- 1 gallon 5 per cent chlorine bleach per 500 gallons of water,
- 1 pint 5 per cent chlorine bleach per 62 gallons of water,
- 1.3 pounds high-test calcium

hypochlorite tablets per 1000 gallons of water.

MATERIALS

The entire well depth shall be filled with Bentonite pellets, cement or grout. Sealing materials shall meet the requirements of ASTM D 5299, "Standard Guide for Decommissioning Ground Water Wells, Vadose Zone Monitoring Devices, Bore Holes, and Other Devices for Environmental Activities". Bentonite pellets shall not be installed in wells with standing water.

Bentonite Pellets – Commercially chipped or pelletized Bentonite in a granulated form, with a particle size of 1/4- to 3/4-inch. Powdered Bentonite is not suitable for dry placement in well sealing operations.

Cement Grout – A mixture of one bag (94 pounds) of Portland cement and 6 gallons of water which is fluid enough to be pumped through a small-diameter pipe. This mixture yields a volume of about 1.1 cubic foot. To obtain a better flowing mixture, 3 to 5 pounds of powdered Bentonite may be added per sack of cement and the water increased to not more than 6.5 gallons per sack of cement. Other cement grout mixes may be used. These mixes shall be mixed and installed in accordance with American Petroleum Institute Standards API Class A through H and ASTM D 5299.

Table 1 can be used to determine the minimum volume of materials required per foot of depth in the hole.

TABLE 1

<u>Hole diameter</u>	<u>Volume per foot of depth</u>	
<u>(inches)</u>	<u>gal/ft</u>	<u>cu.ft/ft</u>
4	0.7	0.1
6	1.5	0.2
8	2.6	0.3
10	4.1	0.5
12	5.9	0.8
14	8.0	1.1
16	10.5	1.4
20	16.4	2.2
24	23.6	3.1
36	53.0	7.1
48	94.2	12.6

SEALING PROCEDURE

Sealing materials shall be placed in the well to a point not more than 4 feet below the ground surface.

If there is free-standing water present in the well prior to filling, the water shall be pumped or bailed out, or its volume shall be determined and figured into the amount of water used to mix the sealing material.

If Bentonite pellets are used, they shall be screened to remove dust and fine particles. The Bentonite shall be added slowly at a rate no faster than one bag (50 lb.) per 3 minutes to prevent bridging. The Bentonite shall be saturated with water as it is placed in the well, and tamped into place to assure bridging has not occurred. Water shall be added at a rate of 8 gallons per 50-lb. bag.

If cement grout or concrete is used, the well shall be filled through a pipe (tremie), from the bottom of the well upward, in one continuous operation.

If possible without damaging, caving or blocking the drill hole bore, the casing and/or liner pipe shall be carefully removed from the well as sealing materials are placed. When the casing can not be removed it shall be ripped or perforated to ensure that sealing materials fill any annular space that may exist between the casing and the well bore.

After filling with sealing materials, the top 4feet of hole shall be dug out and if the casing was not removed prior to sealing, the well casing shall be cut off to a minimum of 4-feet below the original ground surface, unless otherwise shown on the drawings. The hole shall be filled with a 1- to 2-foot thick plug of sealing materials, and then covered with topsoil. The topsoil shall be tamped in place and the area shall be graded such that surface water is directed away from the abandoned well location and ponding of water is precluded.

Well Pits. If the abandoned well is located in a walled well pit, proceed with the sealing process as described above. Prior to placing the plug of sealing materials, knock down at least one wall of the pit, then fill with sealing materials and topsoil as outlined above, unless otherwise shown on the drawings.

OPERATION AND MAINTENANCE GUIDE

Once this practice is install the site needs to be periodically inspected to see if the decommissioned well surface seal and adjacent area has not settled or eroded to adversely affect the site. As needed the ground surface around the well site shall be graded to prevent water from ponding around the site.

ADDITIONAL SPECIFICATIONS