

NATURAL RESOURCES CONSERVATION SERVICE
VIRGINIA CONSERVATION PRACTICE STANDARD

WATER WELL DECOMMISSIONING

(No.)

CODE 351

DEFINITION

The sealing and permanent closure of an inactive, abandoned, or unusable water well.

PURPOSE

- Eliminate physical hazard to people, animals, and farm machinery; and to prevent entry of animals, debris, or other foreign substances
- Prevent contamination of groundwater by surface water inflow
- Restore the natural hydrogeologic conditions, to the extent possible, by preventing vertical cross-contamination or co-mingling of groundwater between separate water bearing zones
- Eliminate the possibility of the water well being used for any other purpose
- Allow future alternative use or management of the site

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to any vertical water well that is to be decommissioned.

This practice does not apply to water wells that were used for waste disposal.

CRITERIA

Unless otherwise directed by Virginia Department of Health Private Well Regulations (VDH PWR), criteria for all purposes shall conform to decommissioning procedures presented in ASTM D5299, "Decommissioning of Groundwater Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities."

Decommissioning shall be compatible with all applicable local, State, Tribal, and Federal requirements.

Data collection. As-built construction documents, maintenance records, and other available data for the water well shall be collected and reviewed. Existing conditions shall be documented as defined in Plans and Specifications.

Well preparation. The well shall be cleared of all pumping equipment, valves, pipelines, grease, oil, scum, debris, and other foreign material. Casings, liners, and screens shall also be removed, unless impracticable.

Disinfection. Water wells shall be disinfected as an integral part of the decommissioning process. Before sealing, the entire column of well water shall be brought to an available chlorine concentration of 100 mg/l solution of chlorine at the dosage rates specified in Design Note #4 - Wells. After being agitated in the well water, the solution shall remain for no less than 24 hours to assure complete disinfection.

Plugging the well. The well shall be plugged by using suitable fill materials, with layers of sealing material emplaced to restrict movement of water vertically in the well.

Sealing materials. Sealing materials used in water well decommissioning shall be of sufficiently low hydraulic conductivity to prevent groundwater flow vertically in the well. The Virginia Department of Health has a list of approved materials. This list can be found at www.vdh.state.va.us/EnvironmentalHealth/ONSITE/gmp. Sealing materials do not require disinfection.

Water to be mixed with sealing materials shall be of a quality that conforms to criteria provided in ASTM D5299, part 7.3.3.

Fill material. Fill material shall be clean and free of organic or other foreign matter. The fill material will be graded so that bridging will not occur during placement.

Plugging procedures. Sealing and fill materials shall be placed in the well only after the well water has been disinfected.

All material shall be placed from the bottom of the well upward by methods that avoid segregation, dilution, or bridging of the material.

For wells greater than 30 inches in diameter, clean backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence.

Removal of well casing. If possible, the casing shall be completely removed from the well by either pulling or overdrilling (over-reaming) as explained in ASTM D5299, part 7.3.1 and 7.3.8. Casing that cannot be removed completely shall be cut off at a depth of five feet.

Casings grouted in place. Casings to be grouted in place shall employ a pressurized grouting procedure that will completely fill and seal any open space around the casing. Grout may consist of cement, sand, bentonite, an approved combination of these constituents, or other approved sealing materials.

Casings to be removed from a collapsing formation shall be grouted concurrently with removal, so that the bottom of the casing remains submerged in the grout.

Well-head seal. After the casing has been grouted, place a one-foot thick plug in the hole. The top of the plug shall be located a minimum of five feet from the ground surface and shall completely fill the bore void space that is present upon removal of the casing.

The interval between the ground surface and the top of the cut-off casing shall be sealed with materials that conform to the sealing requirements of VDH PWR.

The ground surface at the sealed well-head shall be mounded a minimum of one foot above the ground surface and graded in a manner that prevents ponding of surface runoff. This mound shall be clearly marked so that future activities in the area will not cause damage to the seal.

Control of artesian pressure. If a well is under artesian pressure (flowing or not flowing), the grout pressure must be maintained to counteract the artesian pressure until initial grout set occurs. Procedures for balancing pressures during grouting operations shall conform to ASTM D5299, part 7.3.7.

Safety. In order to remove the upper section of the casing, it may be necessary to dig a pit around the casing. The side slopes of the excavation shall be 1:1 or flatter. The excavation shall comply with OSHA Trench Safety requirements.

CONSIDERATIONS

If feasible, consider adding a metal "target" to the top 3 inches of well-head seal so that the decommissioned well may be easily located with a metal detector.

PLANS AND SPECIFICATIONS

Plans and specifications for decommissioning a water well shall be consistent with this standard and shall describe the requirements for applying the practice to achieve its intended purposes. The VDH PWR require the use of the Commonwealth of Virginia Uniform Water Well Completion Report. This document contains both the Well Data and the Abandonment Information. Additional information that shall be collected includes:

- Location of the decommissioned well by Global Positioning System, latitude/longitude, township/range, or other georeferencing convention, of such precision that it can be readily re-located.
- Date of completion of well decommissioning
- Name, title, and address of person responsible for well decommissioning

- Photographs before and after decommissioning
- Detailed documentation of all other pertinent information based on site conditions and any other problems encountered during decommissioning

OPERATION AND MAINTENANCE

The practice site shall be inspected periodically to ensure that the decommissioned well and the adjacent area have not settled or eroded, or are

otherwise adversely disturbed. The well site and adjacent ground surfaces shall be maintained in a manner that prevents ponding of surface runoff on the site.

REFERENCES

Virginia Department of Health. Private Well Regulations (12 VAC 5-630).

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