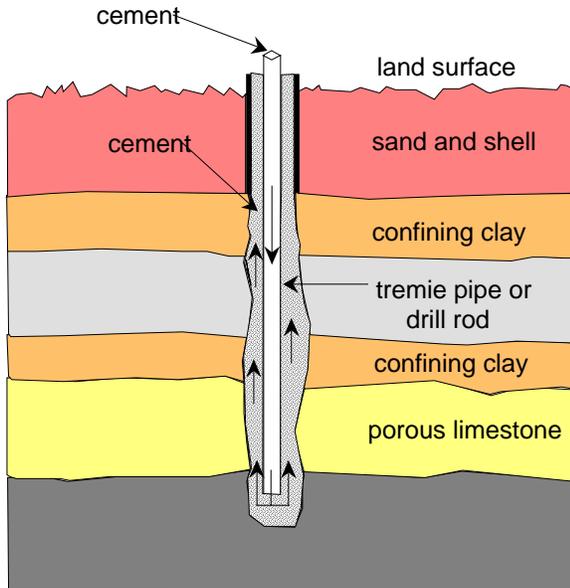


NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

WELL DECOMMISSIONING

(NO.)
Code 351



DEFINITION

The sealing and permanent closure of a water well no longer in use.

PURPOSES

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- Prevent entry of vermin, debris, or other foreign substances into the well or well bore hole;
- Eliminate the physical hazard of an open hole to people, animals, and farm machinery;
- Prevent entry of contaminated surface water into well and migration of contaminants into unsaturated (vadose) zone or saturated zone;
- Prevent the commingling of chemically or physically different ground waters between separate water bearing zones.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to any drilled, cored, bored, washed, driven, dug, jetted or otherwise constructed vertical water well determined to have no further beneficial use.

This practice does not apply to wells that were used for waste disposal, or if evidence of contamination exists. This practice does not apply to wells that contain contaminant levels that exceed state or Federal water quality standards. Treatment of contamination source(s) is required before a well is decommissioned.

CRITERIA

General criteria for design parameters, acceptable installation processes, or minimum performance requirements applicable to all purposes named above.

Planned work shall comply with all Federal, state, and local laws and regulations. Plans to plug a water well must be permitted by the appropriate Water Management District (WMD) and comply with this standard, Florida Department of Environmental Protection (FDEP) Chapter 62-532 Florida Administrative Code (F.A.C.), Water Well Permitting and Construction Requirements, and the appropriate WMD Chapter 40-3 F.A.C., Regulation of Wells.

Data collection. All available data for the well shall be collected and reviewed from as-built construction and maintenance records; i.e., well log, the materials schedule, length, and diameter of casing, total well depth, type of liners and

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screens, and related information. The existing conditions of the well shall be documented as shown in the "Plans and Specifications" section.

Well preparation. The well shall be cleared of all obstructions (e.g., pumping equipment, valves, pipelines, casing liners, debris, and other foreign material) prior to decommissioning the well unless an alternate plan is approved by the permitting authority.

Casing. The well casing should be removed if possible. Where the well casing cannot be removed, and an open annular space exists between the outside of the casing and the well bore, then the annular space must be sealed, using sealing materials described in this standard. As an alternative the casing may be ripped or perforated to ensure that sealing materials completely fill the casing and any annular space. Also see "Surface Seal" section of this standard.

Disinfection. If required by the permitting authority, the well water shall be brought to a 100 ppm chlorine concentration or other solution specified in the permit, prior to sealing.

Sealing materials. The well bore shall be filled from the bottom to the land surface with neat cement grout. Alternate methods providing equivalent protection shall be approved by the FDEP or the permitting authority. All materials used for sealing any portion of the well shall have a hydraulic conductivity equivalent to or less than that of the lowest hydraulic conductivity of the geologic materials being sealed. Properties of sealing materials shall conform to characteristics listed in ASTM D 5299, Part 6.3 Plugging Materials.

Fill materials. When allowed by state regulations, fill materials, such as sand, pea gravel, sand-gravel mix or crushed stone may be used to plug the well provided that zones of sealing materials (conforming to ASTM D 5299, Part 6.3) are placed no less than one foot thick each at intervals no greater than 10 feet within the column. Fill materials shall be clean and free of organic or other foreign matter. The gradation shall be such that bridging will not occur during placement. Approval for using fill materials must be obtained in writing from the FDEP or the permitting authority.

Placement of materials. All materials shall be

placed without bridging. For wells greater than 30 inches in diameter, backfill shall be placed in a manner that minimizes segregation and bulking in order to prevent surface subsidence.

Surface seal. The casing shall be completely removed from the well or cut off at a depth not less than 3 feet below ground surface or at the maximum depth of frost penetration, whichever is greater. Local frost heave and fracturing hazards shall be considered in the design of the surface seal. An interval not less than 3 feet below the cut-off casing shall be sealed with sealing materials. These materials may be an extension of the sealing materials used below this depth.

The interval between the ground surface and the top of the cut-off casing shall be filled with soil materials that achieve an in-place hydraulic conductivity equivalent to or less than the surface soil surrounding the well. The ground surface at the sealed well site shall be mounded and graded in a manner that prevents ponding of surface runoff.

Protection. All disturbed areas surrounding the well shall be vegetated according to NRCS conservation practice standard Critical Area Planting, Code 342.

Additional criteria to prevent commingling of ground waters between separate water bearing zones.

Wells with open annular space around the casing shall be treated in a manner that seals the voided annular space. Methods of treatment include (1) removing the casing or (2) grouting the casing in place.

Casing removal is acceptable when the entire casing can be removed from the well. Casings removed from a collapsing formation shall be grouted concurrent with removal such that the bottom of the casing remains submerged in the grout.

Casings grouted in place shall employ a grouting procedure that will fill the open space. Perforated or ripped casing shall provide sufficient apportioned open area to assure passage of the grout to the annular space. The casing may be required to be perforated or ripped throughout the entire length of a confining layer if required by the permitting authority.

CONSIDERATIONS

This practice may be part of a ground water protection system that includes water and chemical management practices.

To the extent practicable, an abandoned well should be decommissioned in a manner that restores the original hydrogeologic conditions of the well site and does not preclude the use of the site from future land management practices.

Decommissioning requires special consideration of specific geological, biological, physical, and climatic conditions, the chemical composition of the surrounding soil, rock, and ground water at the well site, and the well's construction practices. All procedures, fill and sealing materials need to be selected according to these considerations.

PLANS AND SPECIFICATIONS

Plans and specifications for decommissioning abandoned water wells shall be consistent with this standard and shall describe the requirements for applying the practice to achieve its intended purposes. A record of the installation of this practice shall be made and shall include the following information:

- Location of the decommissioned well by latitude/longitude, township/range, section, quarter-quarter, or other georeference convention, of such precision that it can be readily located in the field, if required, in the future.

- Date of well decommissioning.
- Name of landowner.
- Total depth of well.
- Inside diameter of well bore or casing.
- Casing material type or schedule (e.g., standard weight steel, or PVC Schedule-80).
- Static water level measured from ground surface.
- Types of materials used for filling and sealing, quantities used, and depth intervals for emplacement of each type.

All construction must be performed by a Florida licensed water well contractor except for wells exempted under WMD Chapter 40-3 F.A.C.

OPERATION AND MAINTENANCE

The well 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

ASTM D 5299
 FDEP Chapter 62-532
 NRCS Conservation Practice Standard, Critical Area Planting, Code 342
 WMD Chapter 40-3 F.A.C.