



Natural Resources Conservation Service
CONSERVATION PRACTICE STANDARD
CONTROLLING EXISTING FLOWING WELL
CODE 352

(no)

DEFINITION

The capping and controlling of an existing flowing artesian well at the wellhead to stop or reduce water discharge from within the well casing.

PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Prevent surface and groundwater depletion.
- Protect shallow ground water resources from organic and inorganic contamination.
- Prevent flooding or ponding.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to:

Agricultural land with an existing well intended for agricultural water supply that has uncontrolled water discharge.

This practice is intended for a site where no unidentified or potentially hazardous waste is observed or expected per Natural Resource Conservation Service (NRCS) National Engineering Manual (NEM) (Title 210), Part 503, Subpart E, "Prohibited Technical Assistance."

This practice standard does not apply to:

- Well decommissioning. See NRCS Conservation Practice Standard (CPS), Well Decommissioning, Code 351.
- A well where the casing is not structurally sound and/or the annulus seal is not adequate.
- Spring developments. See NRCS CPS Spring Development, Code 574.

CRITERIA

General Criteria Applicable to All

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at <https://www.nrcs.usda.gov/> and type FOTG in the search field.

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Purposes Laws and Regulations

Planned work must comply with all applicable governmental regulations, laws, permits, licenses, and registrations.

Roles and Responsibilities

NRCS staff with appropriate Job Approval Authority or licensed water well contractor must complete a well evaluation before work can commence to control the existing flowing well.

A licensed water well contractor is required onsite during the evaluation to determine if controlling the flow is practical and which methods could be used to control the flow. A licensed water well contractor must perform all work on an existing flowing well.

Well Evaluation Requirement

Collect and review all available data related to the well, including as-built construction and maintenance records to determine if the well is adequate for agricultural use:

- Evaluate well casing and annulus condition using a downhole camera and/or geophysical logging. Determine if well casing is intact and is installed according to industry standards and state law.
- If the well casing is not defective and replacement, repair, decommissioning, or a new well is not needed, evaluate water quality and quantity.
- Test water quality according to CPS Groundwater Testing, Code 355.
- Evaluate well production. Refer to Title 210, National Engineering Handbook, (NEH) Part 631, Chapter 31, "Groundwater Investigations" Section 631.3112, "Aquifer Testing" for guidance on conducting, recording, and analyzing aquifer tests.
- If the well is necessary but the evaluation shows the well is not suitable, refer to CPS 642 Water Well.

Seal the well according to CPS Water Well Decommissioning, Code 351 if:

- The casing is not structurally sound and repairs are not practical.
- The water quality is unsuitable for the intended purpose and there is no feasible treatment option.
- The well production is inadequate for the intended purpose.
- The well is not needed.

Well Head Design

If there is potential serviceability, install a watertight and frost proof control valve at the top of the well after the well evaluation.

Design wellhead to:

- Contain aquifer pressures at the surface.
- Shut off flow when water is not used.
- Withstand cold temperatures and freezing and prevent frost damage.
- Produce the available water supply when used.
- Accommodate any flammable, toxic, or asphyxiating gas the aquifer may produce.
- Protect from damage by animals and vehicles.

Disinfection

Flowing artesian wells generally do not require disinfection unless a well tests positive for bacteria. To disinfect a flowing artesian well, install a temporary casing extension above the potentiometric level to stop the flow and increase chlorine contact time. Alternatively, secure a tight well or seal and pump the chlorine into the well through the cap.

Disinfect the well with a minimum chlorine solution concentration of 50 mg/L (50 ppm), or the minimum chlorine solution concentration specified by the regulating authority, whichever is greater. After adding the chlorine solution, agitate the well water to distribute the solution, and keep the well undisturbed for a minimum of 12 hours to allow for disinfection.

When the casing extension or cap is removed, discharge will flush chlorine from the well. If discharged chlorinated water has the potential to harm the environment, use a neutralizing agent, such as Vitamin C, to inactivate the chlorine. Add to sump or discharged chlorinated water.

Protection

Divert all surface runoff, precipitation, and drainage away from the wellhead. Compact, mound, and slope earth material away from the wellhead. Protect the wellhead and associated appurtenances from contamination or damage by wildlife, livestock, farm machinery, vehicle parking, or other harmful human activity. When needed, vegetate disturbed areas surrounding the wellhead according to NRCS CPS Critical Area Planting, Code 342.

CONSIDERATIONS

This practice may be part of a groundwater protection system that includes water quality management practices.

Consider rehabilitating costs against well decommissioning and drilling a new well designed to perform the same purpose.

To the extent practicable, rehabilitate the well in a manner that does not impair the current land use near the well or the installation of future land management practices.

Consider all relevant geological, biological, physical, and climatic conditions of the soil, rock, groundwater and topography in determining the best methods to control the discharge of the existing flowing well.

Consider water treatment options. Refer to Title 210, NEH Part 631, Chapter 31, "Groundwater Investigations", Section 631.3108 "Groundwater Quality" for guidance on treatment options.

Consider potential impacts associated with discharging artesian flows, such as erosion and ground instability (e.g., sink holes and subsidence) and hazards (e.g., pooled water or ice).

PLANS AND SPECIFICATIONS

Prepare plans and specifications for controlling flows in a well that describes requirements for applying the practice to achieve its intended purpose(s). If not already specified in state required documentation, ensure the following information is recorded in the installation record:

- Location of water well by Global Positioning System (GPS) coordinates or in a sufficiently detailed narrative description to readily locate the well.

- Date of completion of controlling flowing well.
- Well owner name and address.
- Name and address of water well contractor responsible for the installation of the work.
- Length and inside diameter of all casing and screen set including gage (slot size) of casing screen.
- Type of schedule casing material (e.g., standard weight steel, PVC Schedule 80).
- Packer type and depth(s), if used.
- Record flow rate and pressure.
- Driller's well log.
- Artesian formation name and depth.
- Type of capping materials or valve used to control artesian flow at the wellhead.
- Aquifer testing result, including test type (e.g., step drawdown or constant rate), test length, stability of water level, pumping rate, and specific capacity after water level is stable.
- Detailed documentation of all pertinent information to the site conditions and other problems encountered during controlling flows.
- Presence of natural hazardous gasses, such as carbon dioxide, methane, or hydrogen sulfide, as applicable.
- If water quality tests were performed, record the parameters, test method and results, sampling date, name of person who took sample, and name of laboratory that conducted testing.

OPERATION AND MAINTENANCE

Prepare a plan for operation and maintenance of the water well and improvements installed. The owner is responsible for keeping and maintaining well construction records with the maintenance plan. The owner must ensure periodic inspection of the well to confirm it is properly functioning and producing acceptable water quality. The inspection must include conditions that affect well performance as designed for the water use. As a minimum, these conditions include:

Declines in discharge, static potentiometric surface (well head pressure), and maximum pumping level, that are outside of acceptable limits for proper functioning as well as the following:

- Appearance of sediment that may damage the well, pump, or appurtenances.
- Changes in water quality including odor, color, taste, and chemistry.
- Bacteria presence.
- Evidence of leaking casing or valves or other damage to the well.

Include in the maintenance plan statements describing identified problems, corrective action taken and date, and specific capacity of well before and after corrective action was taken. The owner must remedy unacceptable well construction conditions in a timely manner.

REFERENCES

USDA NRCS. 2017. National Engineering Manual (NEM) (Title 210), Part 503, Subpart E, "Prohibited Technical Assistance".

USDA NRCS. 2021. National Engineering Handbook (NEH)(Title 210), Part 650, Chapter 12, Section 650.1205, "Wells" and Section 650.1202 "Water Supply Source".

USDA NRCS. 2022. National Engineering Handbook (Title 210), Part 631, Chapter 31, Section 631.3112, "Groundwater Aquifer Testing".