

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

SPRING DEVELOPMENT

(No.)

CODE 574

DEFINITION

Collection of water from springs or seeps to provide water for a conservation need.

PURPOSE

Improve the quantity and/or quality of water for livestock, wildlife or other agricultural uses.

CONDITIONS WHERE PRACTICE APPLIES

In areas where a spring or seep will provide a dependable supply of suitable water for the planned use.

CRITERIA

General Criteria Applicable to All Purposes

Spring developments shall be planned, designed, and constructed in compliance with federal, state and local laws and regulations.

Laws and regulations of particular concern include those involving water rights, land use, pollution control, property easements, wetlands, preservation of cultural resources, and endangered species.

On sites within 0.6 miles of sage-grouse leks, activities associated with this practice will not be conducted from March 15 to June 30 in compliance with the Governor's Executive Order 2010-4,

An investigation of site conditions shall be made, including:

- a. Soil borings
- b. Water quality for the intended purpose
- c. Water quantity for the intended purpose

- d. Suitability of the spring location for the intended purpose
- e. A determination that the farmer has the appropriate water rights or permits to develop the spring
- f. An assessment to determine existing ecological functions and potential losses from the spring development
- g. A certified wetland determination (When covered by a US Army Corps of Engineers - COE - Nation Wide Permit that does not require COE notification or a wetland delineation, and when practice installation will not enable increased agricultural commodity production, the certified wetland determination may be done either by personnel with Reg. IV Job Approval Authority or by personnel with Off-Site determination Job Approval Authority that are very familiar with the site.)
- h. An assessment of the cultural resource associated with the spring.

Develop springs by removing obstructions to the flow, collecting the water flow and storing the water, if flow from the spring is not sufficient to meet the peak demand of the intended use.

Remove obstructions to spring flow such as fine-grained sediments, rock, slope-wash materials, vegetation, and clean and enlarge joints or fractures as needed to allow the spring to flow freely. Design the development of the spring to prevent obstructions from reoccurring.

The type of collection system used for the spring development is dependent upon the type of spring and site geology. Design the collection system to collect sufficient water for the intended purpose of the spring. Collection systems generally consist of a restrictive

barrier that forces water to collect in a perforated pipe or a gravel filled ditch that flows to an outlet. Include measures in the collection system to prevent sediment from entering the system and/or provisions to trap and remove sediment that does enter the system. The collection works shall be constructed an adequate distance below the elevation of the spring (openings) to permit free discharge.

Include a spring box, if necessary, to allow sediment to settle out of the spring flow or to provide storage to meet peak demands on the water from the spring. Locate the spring box to allow water to flow by gravity from the spring to the spring box. Construct the spring box of a durable material such as concrete, plastic, galvanized steel or naturally rot resistant wood.

The spring box shall be of sufficient size to provide for the storage of sediment and any required storage of water. The cross-sectional area of the spring box shall be large enough to allow access for periodic cleaning. The box shall have a minimum cross-sectional area of 1-1/2 feet². Provide the spring box with a tight fitting cover to prevent trash and surface runoff from entering. To prevent freezing, bury the spring box in the soil.

The spring development shall have an outlet pipe that carries the water to its intended use. Design the outlet pipe according to Conservation Practice Standard Pipelines, 516, Pipeline. If the outlet is from a spring box, the outlet pipe shall be a minimum of 6 inches off the floor to allow for sediment collection.

The outlet pipe must have positive grade away from the spring box or collection system unless vent pipe(s) are added to prevent air locks. The outlet pipe shall be a minimum 1-1/4 inches (3-cm) diameter.

In lieu of site-specific spring flow and pipe vent calculations, the outlet pipe shall have the following minimum size based on line grades:

1. 1-1/4 inches inside diameter for line grades greater than 1.0 percent.
2. 1-1/2 inches inside diameter for line grades greater than or equal to 0.5 percent but less than or equal to 1.0 percent.

3. 2 inches inside diameter for lines grades less than 0.5 percent.

A pump will be needed if gravity will not carry water from the spring to where the water will be used. Base the type and size of the pump upon available power sources and the water delivery needs.

When flow from the spring, whether intermittent or continuous, will exceed the capacity of the collection system, an overflow is required. Size the overflow to carry the maximum flow expected from the spring during periods of wet weather. The overflow, if needed, shall meet the requirements found in Conservation Practice Standard 614-Watering Facility. Manage the overflow so that it does not create a resource problem.

Design the spring development so that it is protected from damage by freezing, flooding, livestock, excess sediment, vehicular traffic and water quality contamination.

Restrict livestock access to the spring development with wildlife friendly or buck and pole fencing.

Design the spring to maintain the hydrologic conditions that support the moist soil habitats associated with springs. For example, incorporate a float valve that shuts off flow to the tank and maintains some flow at the spring site to support wetland/riparian plants.

Follow Conservation Practice Standard 614, Watering Facility to design facilities to provide access for livestock and wildlife to water from the developed spring.

Regrade areas disturbed by construction of the spring development to keep surface flow out of the spring. Revegetate disturbed areas as soon as possible after construction. Establishing vegetation on disturbed areas shall be in accordance with Conservation Practice Standard 342-Critical Area Planting.

Until completely re-vegetated, annually monitor disturbed areas to enable early detection and control of invasive plants.

Measures shall be included to protect appurtenances from damage by freezing, flooding, sedimentation, contamination, vehicular traffic, and livestock.

CONSIDERATIONS

A shutoff valve and vent system on the spring outlet pipe should be considered for winter shutdown, flow control and maintenance.

Native vegetation adapted to wet conditions should be considered on wet sites as an alternative to introduced grasses to stabilize areas after construction.

Consider how other conservation practices properly applied on the spring recharge area may increase infiltration of precipitation in order to conserve the spring's flows.

Consider how diversion of water from spring developments affects stream flows in the watershed.

Springs are sources of water for fish and wildlife. Maintain fish and wildlife access to water from the spring development where possible.

Brush removal, excavation, clean out and withdrawal of water are manipulations that may affect wildlife habitat and wetland functions and values. However, selective removal of undesirable brush and management for desirable native plants may reduce evaporative losses and conserve biodiversity.

PLANS AND SPECIFICATIONS

Plans and specifications shall provide details of planned location, materials and construction requirements for the installation of the practice to meet its intended purpose.

OPERATION AND MAINTENANCE

The O&M plan shall contain a schedule for the periodic monitoring of the following items:

- Sediment buildup in the spring box
- Clogging of outlet and overflow pipes
- Diversion of surface water from the collection area and spring box
- Erosion from overflow pipes
- Rodent damage

Any problems discovered shall be immediately repaired.

REFERENCES

Groundwater & Wells, Fletcher Driscoll, Johnson Division.

National Engineering Handbook - Part 650, Engineering Field Handbook, Chapter 12, Springs and Wells.

National Engineering Manual, Part 531 Geology 531.31, USDA, Natural Resources Conservation Service,

State of Wyoming, Governor's Executive Order 2010-4 and Attachments. Greater Sage-Grouse Core Area Protection. August 18, 2010

The Restoration & Management of Small Wetlands of the Mountains & Piedmont in the Southeast. Somers, A. B. et al. USDA, Natural Resources Conservation Service, Watershed Science Institute. November 2000.

Water Supply Paper 2220, Basic Groundwater Hydrology, US Geological Survey.