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

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.

h. An assessment of the cultural resource associated with the spring.

i. Risk of invasive species becoming established as a result of spring development.

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 and vegetation 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 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.

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. 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 the delivery point of 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.

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. Manage the overflow so that it does not create a resource problem.

Minimize the amount of flow diverted from the spring to that necessary to meet the purpose and redirect as much flow as possible to the original wetted area or watercourse.

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

Follow Conservation Practice Standard 382, Fence to protect the spring discharge point, adjacent wetland functions, and a buffer from livestock and human impacts as necessary. At a minimum, use buffer width recommendations in Conservation Practice Standard 393 Filter Strip. Springs are sources of water for fish and wildlife. Maintain fish and wildlife access to water from the spring development where possible.

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 sediment out of the spring. Follow Conservation Practice Standard 550 Range Planting to revegetate disturbed areas as soon as possible after construction to prevent soil erosion and colonization by invasive species.

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.

Aquatic habitat quality may be conserved when a spring is developed near surface waters, or on a floodplain, by incorporating a float valve or other appurtenance that shuts off flow to the tank, or returns overflow via a stable outlet to the same watershed where it was collected.

Springs may represent islands of unique habitat in the landscape, supporting plant and animal populations that only occur in an area of a high water table. Consider options for developing the spring or seep that preserve the conditions that support these unique habitats.

Work with the appropriate State and/or Federal wildlife agency to reintroduce native fish and/or amphibian species to the spring habitat where appropriate.

Document effects on the spring point of discharge and buffer area with photography taken before and after implementation.

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
- Invasive species

Any problems discovered shall be immediately repaired or controlled.

REFERENCE

Driscoll, Fletcher G. 1986. Groundwater and Wells. Reynolds Guyar Designs, Austin, Minnesota. 1089 pp.National Engineering Handbook - Part 650, Engineering Field Handbook, Chapter 12, Springs and Wells.

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.

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

U.S. Department of Interior. 2001. Riparian area management: A guide to managing, restoring, and conserving springs in the Western United States. Technical Reference 1737-17. Bureau of Land Management, Denver, Colorado. BLM/ST/ST-01/001+1737. 70 pp.

Water Supply Paper 2220, Basic Ground-water Hydrology, US Geological Survey.