NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

SPRING DEVELOPMENT

(NO.)

CODE 574

DEFINITION

Collection of water from springs or seeps to provide for livestock and wildlife.

PURPOSE

Improve the quantity and/or quality of water for livestock and wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where a spring or seep will provide a dependable supply of suitable water for the planned use.

CRITERIA

General Criteria Applicable to All Purposes

Design the spring development based on site conditions, to collect sufficient water for the intended purpose of the development while protecting ecological functions of the site.

- Identify and evaluate alternative water sources before considering the development of a spring.
- Document the need for spring development in either a grazing or wildlife management plan.

Spring development for livestock water may cause adverse impacts to fish and wildlife habitat. Develop only as much water as is needed to facilitate prescribed grazing.

- Conduct an evaluation of the site to determine:
- Water quantity for the intended purpose
- Water quality for the intended purpose
- Suitability of the spring location for the intended purpose
- Soil and geologic suitability
- Effects on existing ecological functions of the spring and potential losses from the development, including effects of the impoundment and/or diversion of spring water on local wildlife and wildlife habitat, and the effects of consumptive use on riparian health and function, stream flow, water temperature, and local aquifer recharge.
- If the site is determined to be a wetland, appropriate actions must be taken to avoid, minimize, or mitigate adverse impacts.

- Evaluate impacts to wetland function and value using Wildlife Habitat Evaluation Guides and/or functional assessment tools, where available.
- Design the spring development so that it is protected from damage by freezing, flooding, livestock, excess sediment, vehicular traffic and water quality contamination.

Source area. Design the spring development to preserve existing morphology of the spring as much as possible. Locate the collection site down slope of the point where the spring or seep emerges.

Exclude livestock from the source area.

Maintain fish and wildlife access to water from the spring development where applicable.

Develop the spring by removing obstructions to spring flow such as fine-grained sediments, rock, slope-wash materials and vegetation. Design the development of the spring to prevent obstructions from reoccurring.

Collection system. A collection system generally consists of tile, perforated pipe, or gravel collectors installed upstream of a cutoff wall. These collectors convey the spring flow to either a spring box or directly to a pipeline, which conveys the flow to the point of use.

The cutoff wall may be constructed of concrete, clay, masonry, plastic sheeting or sheet pile.

If the point of use is above the spring, base the type and size of the pump on available power sources and water delivery needs. The pump shall meet the criteria of Conservation Practice Standard 533, Pumping Plant.

Include measures as needed to prevent sediment from entering the collection system, and/or include a spring box to trap and remove accumulated sediment. A spring box may also be used to store water to meet peak water demands.

Spring box. Locate the spring box downhill from the source if possible. Protect the spring box from freezing by burying in the soil or other methods suitable for the site.

Size the spring box to provide sufficient storage of both sediment and any required water storage. Ensure that the cross-sectional area of the spring box is large enough to allow access for periodic cleaning. Use a minimum cross-sectional area of 1.5 ft^2.

Construct the spring box of a durable material such as concrete, rock, plastic, galvanized steel or wood that is untreated or rot resistant.

Provide the spring box with a tight fitting cover to prevent surface runoff, animals or trash from entering.

Locate the outlet pipe a minimum of 6 inches above the floor of the spring box to allow for sediment collection.

Outlet. Provide the spring development with a means to carry the water to its intended use. If a pipe is used, design the pipe according to Conservation Practice Standard 516, Livestock Pipeline. Alternative outlet structures shall meet the criteria of Conservation Practice Standard 587, Structure for Water Control.

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Facilities intended to provide access to water from the developed spring shall be designed according to Conservation Practice Standard 614, Watering Facility.

Spring flow management. 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. Locate the overflow so that it does not cause erosion, degrade water quality or create wet conditions near the watering facility.

To minimize potential adverse impacts to wetlands, one of the following measures should be implemented (listed in order of priority):

- Install a float valve on the tank/trough, if applicable, and leave all excess water in the spring.
- Direct overflow back as close to the source as possible to enhance existing wetlands.
- Create new wetland habitat that is capable of providing similar wetland functions as those being lost.

Smooth and grade areas disturbed by construction of the spring development as needed, to properly manage runoff from natural spring flow, collected water, and overflow.

Re-establish vegetation on disturbed areas after construction with native plant materials where possible. Where vegetation is difficult to re-establish, follow Conservation Practice Standard 342, Critical Area Planting.

CONSIDERATIONS

Springs often contain rare flora and fauna. Development should minimize disturbance to these species. Policy regarding impact to threatened, endangered, or special concern species must be followed.

A shutoff valve and vent system on the spring outlet pipe should be considered for winter shutdown, flow control and maintenance. Open pipe vents should be screened to prevent wildlife entrapment and potential water contamination.

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.

Prior to construction, identify and control any undesirable plant species that may be spread by seed or vegetatively.

Consider how other conservation practices applied within the spring recharge area may increase infiltration of precipitation or snowmelt to augment spring's flows.

To the degree possible, exclude livestock access to existing wet and constructed overflow areas to protect water quality and quantity.

Natural springs and seeps tended to attract prehistoric and historic settlements and activities, which correspondingly increases the likelihood that cultural resources are present in and around the spring.

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.
As a minimum the plans and specifications shall include:

- Location of the spring development
- Materials to be used including pipe diameter and class, collection system, etc.
- Elevations of pertinent components such as collection system, pipes, etc.

OPERATION AND MAINTENANCE

The Operation and Maintenance (O&M) shall be provided to, and reviewed with, the landowner. 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
- Vandalism and theft

Any problems discovered shall be immediately repaired. When cleaning out sediment from the spring box, place all sediments in the uplands away from the spring and associated wetlands.

REFERENCES

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APPROVAL AND CERTIFICATION

SPRING DEVELOPMENT

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PRACTICE STANDARD APPROVED:

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State Conservation Engineer

October 31, 2014
Date

NRCS, Texas

October 2014