

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**WATERING FACILITY**

(No.)

**CODE 614**

**DEFINITION**

A permanent or portable device to provide an adequate amount and quality of drinking water for livestock and or wildlife.

**PURPOSE**

To provide access to drinking water for livestock and/or wildlife in order to:

- Meet daily water requirements
- Improve animal distribution

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and/or wildlife.

**CRITERIA**

**General Criteria Applicable To All Purposes**

Design watering facilities with adequate capacity and supply to meet the daily water requirements of the livestock and/or wildlife planned to use the facility. Include the storage volume necessary to provide water between periods of replenishment. Refer to the National Range and Pasture Handbook for guidance on livestock water quantity and quality requirements. Virginia Engineering Design Note #642 – Water Well also lists livestock water requirements. For wildlife, base water quantity and quality requirements on targeted species needs. Virginia Engineering Design Note #614 – Watering Systems contains information on the design of watering systems.

Locate facilities to promote even grazing distribution and reduce grazing pressure on sensitive areas.

Design the watering facility to provide adequate access to the animals planned to use the facility. Incorporate escape features into the watering facility design where local knowledge and experience indicate that wildlife may be at risk of drowning.

Include design elements, such as storage reservoirs, to meet the specific needs of the animals that are planned to use the watering facility, both livestock and wildlife.

Protect areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns. Use criteria in Virginia Conservation Practice Standard *Heavy Use Area Protection (Code 561)* to design the protection.

Install permanent watering facilities on a firm, level, foundation that will not settle differentially. Examples of suitable foundation materials are bedrock, compacted gravel and stable, well compacted soils.

The site should be well-drained; if not, drainage measures will be provided.

Design and install watering facilities to prevent overturning by wind and animals.

Design watering facilities and all valves and controls to withstand or be protected from damage by livestock, wildlife, and freezing.

Construct watering facilities from durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Follow appropriate NRCS design procedures for the material being used or industry standards

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#), or download it from the [electronic Field Office Technical Guide](#).

where NRCS standards do not exist.

The following minimum guidelines for materials shall be used:

Concrete	3000 psi compressive strength
Galvanized Steel	20 gauge thickness
Plastic	Ultraviolet resistance or durable coating to protect against sunlight
Fiberglass	Ultraviolet resistance or durable coating to protect against sunlight

Use the criteria in Virginia Conservation Practice Standard *Pipeline (Code 516)* to design piping associated with the watering facility. Include backflow prevention devices on facilities connected to wells, domestic or municipal water systems.

#### **Additional Criteria for Livestock Watering Ramps**

**General.** In a stream, a portion of the ramp shall be depressed at or below the average stream bottom elevation when needed to keep base flows or low flows concentrated.

Cutoff walls shall be provided at the upstream and downstream edges of livestock watering ramps when needed to protect against undercutting.

The finished top surface of the livestock watering ramp in the bottom of a stream shall be no higher than the original stream bottom at the upstream edge of the ramp. If the downstream edge of the ramp is above the original stream bottom, the ramp shall be stabilized in accordance with Virginia Conservation Practice Standard *Stream Channel Stabilization (Code 584)*.

Where rock is used for livestock watering ramps, use a hoof contact zone or alternative surfacing method over the surfacing rock.

**Armor.** Where a livestock watering ramp is installed in a pond or in a stream with a soft bottom, the bed shall be excavated to the

necessary width and depth and covered with geotextile material. The geotextile shall be installed on the excavated surfaces of the ramp. The geotextile material shall be covered with at least six inches of crushed rock of a size and thickness that will withstand the anticipated velocities.

If the stream bottom is composed of stable coarse rock material or solid bedrock, no geotextile is required on the stream bottom.

**Width.** The minimum width of the watering ramp shall be the width needed to accommodate the expected usage but shall not be less than 12 feet wide.

**Length.** The watering ramp shall extend into the water far enough that the animals will have access to the water during the driest times of the year.

**Approaches.** Approaches to the watering ramp shall blend with existing site conditions, where possible, and shall not be steeper than 6 horizontal to 1 vertical. Unless the foundation geology is otherwise acceptable, the approach shall be stable, have a gradual descent grade, and be underlain with suitable material, as necessary, to withstand repeated and long-term use.

**Side Slopes.** All cuts and fills for the watering ramp shall have side slopes that are stable for the soil involved. Side slopes of earth cuts or fills shall be no steeper than 2 horizontal to 1 vertical. Rock cuts or fills shall be no steeper than 1.5 horizontal to 1 vertical.

**Surface Runoff.** Surface runoff shall be diverted around the approach to prevent erosion of the approach.

**Fencing.** Areas adjacent to the watering ramp shall be permanently fenced or otherwise managed as needed to manage livestock access to the watering ramp. All fencing shall be designed and constructed in accordance with Virginia Conservation Practice Standard *Fence (Code 382)*. Electric fencing shall not be used immediately adjacent to the water.

**Vegetation.** All areas to be vegetated shall be planted as soon practical after construction. When necessary, use of Virginia Conservation Practice Standard *Critical Area Planting (Code 342)* shall be considered.

In areas where vegetation may not survive, the Virginia Conservation Practice Standard *Heavy Use Area Protection (Code 561)* shall be used to protect the soil from erosion.

**Permits.** *Clean Water Act.* If a stream crossing is installed according to this standard and conditions a, b and c below apply, an exemption to the requirements of the Clean Water Act (on file at the State Office) allows construction and no further permits are required. If one or more of these conditions do not apply, an individual local-state-federal joint permit is required. The landowner is responsible for acquiring all needed permits and for all agency contacts.

#### **Conditions**

- a. The watershed area is less than five square miles.
- b. There are no special environmental concerns identified in the Environmental Evaluation (Form VA-1).
- c. Where a ramp will be installed in trout water, the Virginia Department of Game and Inland Fisheries (VDGIF) will be notified of the proposed work and site locations. If a site visit is requested by VDGIF, this visit will be conducted prior to construction.

*COE Nationwide Permit 18.* Under this permit, dredging below the plane of the ordinary high water mark shall not exceed 25 cubic yards. If installation of the stream crossing will require removal of more than 25 cubic yards of material, an individual permit is required.

#### **CONSIDERATIONS**

Design fences associated with the watering facilities to allow safe access and exit for area wildlife species. To protect bats and other species that access water by skimming across the surface, fencing material should not extend across the water surface. If fencing across the water is necessary, it should be made highly visible by avoiding the use of single wire fences and using fencing materials such as woven wire or by adding streamers or coverings on the fence.

For watering facilities that will be accessible to wildlife, give consideration to the effects the location of the facility will have on target and non-target species. Also consider the effect of introducing a new water source within the ecosystem in the vicinity of the facility. This should include things such as the concentration of grazing, predation, entrapment, drowning, disease transmission, hunting and expansion of the wildlife populations beyond the carrying capacity of available habitat.

Where water is supplied continuously or under pressure to the watering facility, consider the use of automatic water level controls to control the flow of water to the facility and to prevent unnecessary overflows.

Watering facilities often collect debris and algae and should be cleaned on a regular basis. Consider increasing the pipe sizes for inlets and outlets to reduce the chances of clogging. Maintenance of a watering facility can be made easier by providing a method to completely drain the watering facility.

Steep slopes leading to watering facilities can cause erosion problems from overuse by animals as well as problems with piping and valves from excess pressure. Choose the location of watering facilities to minimize these problems from steep topography.

#### **PLANS AND SPECIFICATIONS**

Plans and specifications for watering facilities shall provide the information necessary to install the facility.

Record all required information in an engineer field book, on a plan sheet or design computation sheet, or in another appropriate location.

#### **DESIGN DATA**

1. Completed Environmental Evaluation (Form VA-EE-1) and subsequent requirements.
2. Soils investigation.
3. Survey and plot data: profile, cross-sections, as needed.

4. Design computations, including purpose of practice and references used.
5. Plan view of site with existing and planned features, including dimensions, distances, etc.
6. Detail drawings showing the facility, necessary appurtenances (such as foundations, pipes and valves) and stabilization of any areas disturbed by the installation of the facility.
7. Standard Cover Sheet (VA-SO-100A).
8. Materials and quantities needed. Identify borrow material and/or spoil area, as needed.
9. Vegetation and/or ground cover requirements.
10. Identification of needed Erosion & Sediment Control measures.
11. Supplemental practices required.
12. Virginia Conservation Practice Specifications (700 Series).
13. Operation and Maintenance Plan

#### CHECK DATA

1. As-built survey.
2. As-built plans including dimensions, types and quantities of materials installed, and variations from design. Include justification for variations.
3. Locations of appurtenant practices.
4. Adequacy of vegetation and/or ground cover.
5. Complete as-built section of Cover Sheet.

#### OPERATION AND MAINTENANCE

Provide an O&M plan specific to the type of watering facility. to the landowner. As a minimum include the following items in the plan:

- a monitoring schedule to ensure maintenance of adequate inflow and outflow;

- checking for leaks and repair as necessary;
- if present, checking the automatic water level device to ensure proper operation;
- checking to ensure that adjacent areas are protected against erosion;
- if present, checking to ensure the outlet pipe is freely operating and not causing erosion problems;
- a schedule for periodic cleaning of the facility.

#### REFERENCES

Brigham, William and Stevenson, Craig. 1997. Wildlife water catchment construction in Nevada. Technical Note 397.

National Research Council, 1996 Nutrient Requirements of Domestic Animals, National Academy Press.

Tsukamoto, George and Stiver, San Juan. 1990. Wildlife Water Development, Proceedings of the Wildlife Water Development Symposium, Las Vegas, NV, USDI Bureau of Land Management.

USDA-Natural Resources Conservation Service. National Engineering Handbook – Part 650, Engineering Field Handbook, Chapters 5, 11 & 12.

USDA-Natural Resources Conservation Service. National Range and Pasture Handbook, Chapter 6, Page 6-12, Table 6-7 & 6-8.

USDA-Natural Resources Conservation Service. Virginia Electronic Field Office Technical Guide (eFOTG), Section IV. [On-line]. Available at <http://www.nrcs.usda.gov/technical/eFOTG>.

USDA-Natural Resources Conservation Service. Virginia Engineering Design Note #614 – Watering Facility and #642 – Water Well [On-line]. Available at <http://www.nrcs.usda.gov/technical/eFOTG>.

USDA-Natural Resources Conservation Service. Virginia 700 Series Construction Specifications. [On-line]. Available at <http://www.nrcs.usda.gov/technical/eFOTG>.

USDA-Natural Resources Conservation Service. Virginia Standard Drawings [On-line]. Available at [http://www.va.nrcs.usda.gov/technical/standard\\_drawings.html](http://www.va.nrcs.usda.gov/technical/standard_drawings.html).

Yoakum, J. and W.P. Dasmann. 1971. Habitat manipulation practices. Ch. 14 in Wildlife Management Techniques, Third Edition. Ed. Robert H. Giles, Jr. Pub. The Wildlife Society. 633 pp.

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