

NATURAL RESOURCES  
CONSERVATION SERVICE  
MARYLAND

CONSERVATION PRACTICE  
STANDARD

**WATERING FACILITY**

CODE 614  
(Reported by No.)

**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:

1. Meet daily water requirements;
2. 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.

**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.

Steep slopes leading to watering facilities can cause erosion problems from over use 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.

**CRITERIA**

**Design**

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

Provide fencing as necessary to exclude livestock from protected areas, and encourage use of facility.

Locate as far away from streams and drainage ways as practical.

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.

**Sanitary protection** - If water for the watering facility is supplied from potable water sources the requirements of the state health department for materials and installation must be met. Install pressurized systems in accordance with local regulations. Permits may be required for the installation of these systems. Contact the Permits Division of the local county government for regulations and permit requirements.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the [Natural Resources Conservation Service - Maryland](#) or visit the [electronic Field Office Technical Guide \(eFOTG\)](#).

**Capacity** – provide adequate capacity in the trough or tank to meet the water requirements of the livestock. This will include the storage volume necessary to carry over between periods of replenishment.

Daily consumption of water by livestock

Beef Cattle -	12 gals/head/day
Dairy Cattle -	15 gals/head/day
Horses -	12 gals/head/day
Sheep -	2 gal/head/day
Swine (Hogs) -	4 gal/head/day
Goats -	1.5 gal/head/day
Poultry (Chickens) –	35 gals/1000 head/day

Where water supplies are dependable and livestock are checked daily, troughs with little water storage capacity may be used.

Install troughs on sites that are well drained, or provide drainage. Provide gravel, stone, concrete, paving or otherwise provide for firm footing on the areas adjacent to the trough or tank. The type of treatment is dependent on the type and number of animals and frequency of use. Extend the treatment out a minimum of 6 feet around the trough or tank for cattle and horses and 4 feet for all other animals. Design shall follow the criteria found in Maryland conservation practice standard for Heavy Use Area Protection (Code 561).

**Outlets** – provide automatic water level control and/or overflow facilities. Use underground outlets for overflow pipes. Meet one of the following for overflow pipes:

1. Use an overflow pipe that is one size larger than the inflow line.
2. Provide the capacity to pass the maximum inflow without overtopping the trough rim.

**Protection** - Protect the overflow from clogging by using a submerged inlet or by other approved methods. Pipe the overflow to an acceptable outlet. Meet the criteria outlined in the Conservation Practice Standard for Subsurface Drainage, code 606.

Protect the trough, outlet and appurtenances from freezing and ice damage. Freeze-proof troughs or electric heaters may be used.

**Roof** - When a roof is placed over the trough to provide shade, design the roof for appropriate snow and wind loads and to withstand anticipated livestock and wildlife activities.

### **Vegetation**

Follow the Maryland conservation practice standard, Critical Area Planting, code 342 to determine the appropriate grass species based on site conditions and use.

### **Materials**

**Watering Facility** - use materials with a life expectancy that meets or exceeds the planned life of the installation. Use reinforced concrete, steel, fiberglass, plastic or other equally durable material.

The minimum thickness for galvanized steel is 20 gage.

Use ultraviolet resistant materials when using plastic and fiberglass or provide use materials with a durable coating to protect the structure from deterioration due to sunlight.

Use a minimum compressive strength of 3,000 psi at 28 days for concrete structures and with minimum steel reinforcement of 0.9 square inches per foot. The minimum thickness of concrete for concrete troughs is 4 inches. When concrete troughs have walls that are variable (tapered) in thickness the minimum average thickness of the walls is 4 inches.

Commercially available products that are produced for the purpose of watering facilities and meet the criteria above are acceptable.

The minimum thickness for concrete culvert pipe used as a watering facility is 3 inches. The pipe is to be watertight and in good condition.

**Gravel** – meet the gradations and quality found in the State Highway Administration, Standard Specifications for Construction and Material, Section 901.

**Concrete Pads** – Use a minimum compressive strength of 3,000 psi at 28 days for concrete. Reinforce with #6, 6"x6" welded wire fabric.

**Pipelines** – meet the requirements of the Maryland conservation practice standard for Pipeline, code 516. Connect all pipelines and appurtenances so that they are sturdy, durable and leak free. Protect valves, pipes and other appurtenances from damage from livestock.

### **SPECIFICATIONS**

Plans and specifications for installing troughs and tanks shall be in keeping with this standard and will describe the requirements for applying the practice to achieve its intended purpose. If the trough and/or tank are a component of a system that includes additional conservation practices, the information necessary to construct these additional practices will also be conveyed on the plans.

Clear the foundation area of organic matter and all other unsuitable material. When backfill is required to establish planned grade lines compact the backfill by hand-operated compaction equipment.

Grade the foundation area and the immediately surrounding area to permit free drainage of surface water.

Perform all construction in a professional manner.

### **OPERATION AND MAINTAINENCE**

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:

1. Inspect collection and storage devices, valves, outlets and pipelines at least biannually. Make repairs as needed.
2. Check for and remove debris, algae, sludge or other materials, which may restrict the inflow or outflow system.
3. Prepare guidance for winter weather operation, such as cleaning and discontinuing use, or providing for frost-free use.
4. Protect from damage due to livestock and farm equipment. Maintain fences and other devices used for this purpose.
5. Check for leaks and repair immediately.
6. Check valves, automatic water level devices, and overflow pipes for proper operation.
7. Chemicals may be added to the system for control of algae when used in accordance with local rules and regulations
8. Maintain vegetative cover around the system. Mow at least yearly. Provide weed control as needed. Reseed, lime, and fertilize area as needed.

## SUPPORTING DATA AND DOCUMENTATION

### Field Data and Survey Notes

The following is a list of the minimum data needed:

1. System plan sketch
2. Profile along centerline of proposed pipe from source to outlet.
3. Special control or field feature that must be considered in design.

### Design Data

Record on appropriate engineering paper. For guidance on the preparation of engineering plans see chapter 5 of the EFH, Part 650. The following is a list of the minimum required design data:

1. Plan view including all system components and construction specifications.
2. Profile of system included on the plans.
3. Determine slope of pipeline and difference in elevation between source or collection box inlet and tank overflow, record on plan.
4. Complete pipeline design using methods described in chapters 12, 14 or 15 from the EFH, Part 650, as applicable.
5. Select type and dimensions for tank and spring box (if used) included on the plans.
6. Show type and size of pipeline system on profile on the plans.
7. Show size and type of stabilization treatment around facility on the plans.
8. Job Class on plan.
9. Quantities Estimate.
10. Planting plan. This must meet the criteria, specifications, and documentation requirements of the Maryland conservation practice standard, Critical Area Planting, code 342.
11. Written Operation and Maintenance Plan

### Construction Check Data/As-built

Record on survey note paper, SCS-ENG-28, or other appropriate engineering paper. Survey data will be plotted on plans in red. The following is a list of minimum data needed for As-builts:

1. Documentation of site visits on CPA-6. Include the date, who performed the inspection, specifics as to what was inspected, all alternatives discussed, and decisions made and by whom.
2. Elevations of control features.
3. Dimensions of pipelines, spring box, collection system, trough and other components.
4. Statement on seeding and fencing.
5. Final quantities and documentation for quantity changes. Materials certification.
6. Sign and date checknotes and plans by someone with appropriate approval authority. Include statement that practice meets or exceeds plans and NRCS practice Standards.

**REFERENCES**

1. American Society for Testing and Materials, *ASTM Standards*, Philadelphia, Pennsylvania.
2. American Concrete Institute, *Building Code Requirement for Structural Concrete, ACI 318*, Farmington Hills, Michigan.
3. American Concrete Institute, *Building Code Requirement for Masonry Structures, ACI 530*, Farmington Hills, Michigan.
4. American Institute of Steel Construction, *Manual of Steel Construction*.
5. Maryland Department of Transportation, *Standard Specifications for Construction and Materials*, State Highway Administration, Baltimore, Maryland, 2001.
6. USDA, Natural Resources Conservation Service, *Maryland Field Office Technical Guide, Section IV, Standards and Specifications*.
7. USDA, Natural Resources Conservation Service, *National Engineering Handbook, Part 650*.
8. USDA, Natural Resources Conservation Service. *National Handbook of Conservation Practices*.