NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

WATERING FACILITY

(No.)
Code 614

DEFINITION

A device (tank, trough, or other watertight container) for providing animal access to water.

PURPOSE

To provide watering facilities for livestock and/or wildlife at selected locations in order to:

- protect and enhance vegetative cover through proper distribution of grazing;
- provide erosion control through better grazing land management; or
- protect streams, ponds and water supplies from contamination by providing alternative access to water.

CONDITIONS WHERE PRACTICE APPLIES

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

CRITERIA

General Criteria Applicable To All Purposes

System capacity. A trough or tank and water delivery system shall have adequate capacity to meet the water requirements of the livestock and/or wildlife. This will include the storage volume necessary to carry over between periods of replenishment.

Watering facility capacity. Table 1 shall be used for determining minimum daily requirements, capacity, and depth of individual watering facilities.

Table 1 – Minimum Requirements of Individual Watering Facilities

Kind of Livestock	Capacity gal	Depth inches	Daily Requirement [1/] gal per head per day
Beef cattle	100 (60) [2/]	12	12
Horse	100 (60) [2/]	12	12
Dairy Cattle drinking only			
Lactating	100 (60) [2/]	12	25
Non-lactating	100 (60) [2/]	12	15
Sheep and Goats	15	6	2
Swine	15	6	4

[1/] These requirements vary with climatic conditions, kinds of feed, size of animals, and other factors and may be increased as necessary.

[2/] The minimum capacity of individual watering facilities may be reduced to 60 gallons provided all of the following conditions are met.

1. The pasture is 40 acres or less.
2. Water supply into the trough or tank is at least 5 gpm.
3. The minimum water system storage requirement is met.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Where water supplies are dependable and livestock are checked daily, the minimum individual watering facility capacity shown in Table 1 may be used. Watering facilities must provide the daily water requirement of the livestock and provide access to the entire herd within a short period of time.

Watering system storage capacity. Watering system storage capacity is critical to animal health. System storage capacity shall be determined based on the reliability of the water source and the availability of alternate permanent water sources (such as a pond, lake, stream, etc.) to livestock on the land unit.

Alternate permanent water sources. The minimum individual watering facility capacity shown in Table 1 is the only storage required when a permanent dependable source of water (such as a pond, lake, stream, etc.) is accessible to livestock on the land unit.

Reliable water source. When the source is water well equipped with an electric pump or other reliable source, the minimum watering system storage capacity shall be 3 days. The minimum watering system storage capacity may be provided in a combination of trough or tanks in adjoining pastures.

A well maintained permanently installed electric generator will be considered a permanent dependable source of water provided:

1. The generator is connected to the pump (portable generators are not considered to be a dependable source) and,
2. The generator has the capacity to energize the pump and all other critical components simultaneously.

Unreliable water source. When windmills, solar or other unreliable power powers the source, the minimum watering system storage capacity shall be 7 days. The minimum watering system storage capacity may be provided in a combination of trough or tanks in adjoining pastures.

Replenishment rate. The inflow of water in a 3-hour period plus the individual watering facility (trough/tank) capacity shall equal or exceed one-half the daily requirement for the livestock using the facility.

Site. The site shall be well drained; if not, drainage measures shall be provided. Areas adjacent to the trough or tank that will be trampled by livestock shall be graveled, paved, or otherwise treated to provide firm footing and reduce erosion. Gravel, paving material or other treatment will not be required if the native materials will provide firm footing and resist erosion without special treatment.

Design of the protective surface around the trough shall be in accordance with NRCS conservation practice standard Heavy Use Area Protection, Code 561.

Watering facility components. Automatic water level control and/or overflow facilities shall be provided as needed. Valves or pipes shall be protected by shields or covers to prevent damage by livestock. All valves and water control devices shall allow the minimum inflow rate. Overflow shall be piped to a stable or suitable point of release. The pipes shall be protected from freezing and ice damage. Freeze-proof troughs or electric heaters may be used.

All watering facilities shall be installed in a manner which will prevent the facility from being overturned.

Troughs with a capacity larger than 100 gallons shall be equipped with a minimum 1-inch drain plug to facilitate maintenance of the trough.

When a roof is placed over the trough to provide shade, the roof shall be designed for appropriate wind loads and shall be durable to withstand anticipated livestock and wildlife activities.

All exposed pipes, fittings, and appurtenances shall be galvanized or ultraviolet protected as appropriate.

Materials. All materials shall have a life expectancy that meets or exceeds the planned useful life of the installation. Common construction materials are reinforced concrete, steel, fiberglass, plastic and wood. All designs shall meet the industry standards for the material being used. Generally applicable design requirements and procedures can be found in the documents referenced at the end of this standard.

Concrete structures shall be constructed from a concrete mix producing a minimum

compressive strength of 3,000 psi at 28 days. Galvanized steel tanks shall have a minimum thickness of 20 gauge. Plastic and fiberglass structures shall be made of ultraviolet resistant materials or shall have a durable coating to protect the structure from deterioration due to sunlight.

CONSIDERATIONS

This practice may adversely affect cultural resources and must comply with NRCS General Manual (GM) 420, Part 401.

Wildlife escape devices should be installed to provide small mammals, amphibians, and birds an avenue of escape from the tank. Refer to Section FL600.0505(f)(ii) of the National Range and Pasture Handbook for details on constructing wildlife escape ramps.

Provide room for at least 1 animal in 20 to drink from a watering facility at a time. Plan on 20 inches of perimeter for circular tanks and 30 inches of length for the straight side of a tank for each animal drinking.

Topography should be evaluated to minimize trail erosion and flooding erosion from tank overflow.

Use portable water troughs that can be relocated between grazing events to disperse impacts from trampling vegetation.

Consider locating troughs at least 150 feet from wellheads.

Water supply pipelines should be at least 1 inch in diameter to reduce energy use.

Plan watering facilities at locations to fully utilize grazing lands. Grazing intensity declines significantly with distances from water of more than 800 feet. (See 1997 Missouri Grazing Manual, University of Missouri, 1997).

The size of animals (domestic and wildlife) using the facility should be considered. Watering facilities should be designed so small animals (e.g. calves, goats, deer, etc.) can access the water.

Generally watering facilities should be located within 300 feet of where lactating dairy cattle are grazing. (See publication “Prescribed Grazing and Feeding Management for Lactating Dairy Cows”, New York State Grazing lands and USDA NRCS, January 2000).

PLANS AND SPECIFICATIONS

Plans and specifications for installing troughs and tanks shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. If the watering facility is 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.

Development of plans will be guided by national Engineering Field Handbook, Part 650, Chapter 5, Preparation of Engineering Plans and shall be in accordance with National Engineering Manual, Parts 541 and 542.

OPERATION AND MAINTENANCE

An O&M plan specific to the type of installed trough or tank shall be provided to the landowner. The plan shall include, but not be limited to, the following provisions:

- check for debris, algae, sludge or other materials in the trough which may restrict the inflow or outflow system and treat as needed;
- check for leaks and repair immediately if any leaks are found;
- check the automatic water level device to ensure proper operation and repair as needed;
- maintain areas adjacent to the watering facility to prevent erosion, ponding, and provide firm footing;
- check to ensure the outlet pipe is freely operating and not causing erosion problems and repair as needed; and
- prepare guidance for winter weather, such as adding material in the storage area to allow for ice expansion without damage.

Algae and iron sludge accumulation should be addressed in areas with water quality that is known to cause problems. Chemicals such as copper sulfate and chlorine can be recommended as needed, as long as local rules and regulations are followed.

REFERENCES

Concrete, ACI 318, American Concrete Institute
GM 420, Part 401
Manual of Steel Construction, American Institute of Steel Construction
Masonry, Building Code Requirement for Masonry Structures, ACI 530, American Concrete Institute
National Engineering Manual, Parts 541 and 542
National Engineering Field Handbook, part 650, Chapter 5
National Range and Pasture Handbook, Section FL600.0505(f)(ii)
NRCS Conservation Practice Standard, Heavy Use Area Protection, Code 561
Prescribed Grazing and Feeding Management for Lactating Dairy Cows", New York State Grazing lands and USDA NRCS, January 2000
Timber, National Design Specification for Wood, American Forest and Paper Association
1997 Missouri Grazing Manual, University of Missouri , 1997