

UNITED STATES DEPARTMENT OF AGRICULTURE
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

Capacity/Size. A trough or tank shall have adequate capacity to meet the water requirements of the livestock (generally at least 50 percent of the needs for the day) and/or wildlife. This will include the storage volume necessary to carry over between periods of replenishment. Where water supplies are dependable and livestock are checked daily, troughs with less water storage capacity may be used (25 to 50 percent of the needs for the day). Provide a minimum trough capacity of 50 gallons. Refer to the National Range and Pasture Handbook for guidance on livestock water quantity and quality requirements. For wildlife, base water quantity and quality requirements on targeted species needs.

When water is supplied with non-conventional or alternative means (wind, solar, RAM, turbine, etc.), the system shall be designed with a water budget procedure to ensure the availability of water during periods of insufficient power. A storage tank or reservoir may be required.

Provide premanufactured, "on demand", livestock waterers of the size and in sufficient numbers to meet the needs according to the manufacturer's recommendations.

Install troughs and waterers at a height to meet the needs of the animal being watered. For horses, beef and dairy cattle, the height may vary from 22 to 36 inches.

Ensure that the capacity of the water supply system for the facility is adequate to meet the needs of the anticipated herd size served by the system and that it will deliver the water in a relatively short period of time each day (6 hours or less). For supplying livestock water, the system shall have a capacity to provide at least 12 gallons per head per day for beef cattle and horses, 25 gallons per head per day for dairy cattle, and 1.5 gallons per head per day for sheep and goats. These requirements may need to be increased based on climatic conditions, type of feed, and other factors.

Provide at least 4 feet of elevation head (anticipated water surface elevation during late summer/early fall of pond or elevation of spring box to lip of trough or tank) for gravity flow systems.

Location. Locate the facility where there is natural surface and subsurface drainage. Locate the facility at least 150 feet from any well head, and if possible, down gradient from the well head. Locate the facility to provide easy access by livestock, promote

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even grazing distribution, and reduce grazing pressure on sensitive areas.

In areas subject to prolonged freezing conditions, the facility shall be installed, or manufactured in a manner to prevent the water from freezing or to prevent damage from freezing water.

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.

Heavy Use Protection. Provide heavy use protection within the area of at least 10 ft. (6 ft. for small ruminants that are managed separately from larger animals) outside of the perimeter of the facility. Design the protection according to Conservation Practice Standard Code 561, Heavy Use Area Protection. A portable facility used in intensive rotational systems where vegetative growth around the facility can be maintained is not required to have heavy use area protection. When concrete is used as a heavy use protection, the surface shall have a roughened finish and slope away from the facility to prevent ponding of water on the concrete surface.

Materials. 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 where NRCS standards do not exist.

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

A reinforced concrete trough or tank shall be constructed of good quality concrete using sound, clean aggregates. The concrete mix shall be such that it will produce a compressive strength of 3,000 psi at 28 days. A concrete cast trough or tank shall have a minimum base thickness of 4 inches and a minimum wall thickness of 3 inches. Minimum steel reinforcement shall be one of the following:

- 3/8 in. bars spaced on 8-inch centers in both directions.
- 8 gauge welded wire mesh.

A galvanized steel tank shall have a wall thickness of at least 20 gauge.

Prefabricated plastic and fiberglass facilities shall be made of materials resistant to sunlight or shall be coated with an ultraviolet resistant material.

When a heavy equipment tire is used as a trough or tank, it shall be of suitable quality to perform as intended for the useful life of the practice. Clean the tire to ensure that it is free of chemicals injurious to livestock. Utilize approved standard drawings to prepare site-specific designs for this type of facility.

Appurtenances. Equip troughs and tanks with a suitable water supply pipe, drainage outlet, and overflow outlet, either as individual outlets or a combination of outlets.

A water level control valve or overflow pipe shall be used to maintain the water at least 1 1/2 inches below the top of a trough or tank. Use new galvanized steel or plastic pipe and fittings having a minimum diameter of 1 1/2 inches for the overflow pipe. Drainage outlets for systems with flow-through water must extend at least 10 feet from the trough or tank and outlet at a location to provide a safe and stable discharge. The outlet location must not be accessible to the livestock.

Plumbing shall be new galvanized steel, copper, bronze, or plastic pipe and fittings in conformance with Conservation Practice Standard Code 516 - Pipeline. Water supply pipelines are to have a minimum inside diameter of 1 1/4 inches for gravity flow systems or 3/4 inch for pressurized systems. Connect supply lines in a manner to prevent leakage.

Provide a method of draining the facility for maintenance.

Protect exposed valves or pipes with shields or covers to prevent damage by livestock.

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

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 to meet the specific needs of the animals that are planned to use the watering facility, both livestock and 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.

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 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.

To ensure uniform grazing and waste distribution in the field, cattle should not have to travel more than 800 feet to the facility. The facility should be located so that loafing of the cattle around it is not encouraged. The facility placed under trees encourages loafing and also creates maintenance problems with leaves dropping into it. If water temperature is a concern, a trough or tank can be partially buried.

PLANS AND SPECIFICATIONS

Plans and specifications for watering facilities shall provide the information necessary to install the facility. As a minimum this shall include the following:

- A map or aerial photograph showing the location of the facility
- 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
- Construction specifications describing the installation of the facility

Development of plans will be guided by Engineering Field Handbook, Chapter 5, 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 facility 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;
- check for leaks and repair immediately if any leaks are found;
- check the automatic water level device to insure proper operation;
- check to ensure that adjacent areas are well protected against erosion;
- check to ensure the outlet pipe is freely operating and not causing erosion problems; and
- prepare guidance for winter weather, such as adding material in the storage area to allow for ice expansion without damage.
- A schedule for periodic cleaning of the facility.

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

AL NRCS Conservation Practice Standard
Code 561 - Heavy Use Area Protection
Code 382 - Fence
Code 516 - Pipeline

AL NRCS Guide Sheet
AL 614 - Watering Facility for Livestock

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