

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

WATERING FACILITY

(Number)

CODE 614

DEFINITION

A watering facility is a means of providing drinking water to livestock or wildlife.

PURPOSES

To store or provide designated access to drinking water for livestock or wildlife to:

- supply daily water requirements
- improve animal distribution
- provide a water source that is an alternative to a sensitive resource

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility.

CRITERIA

General Criteria Applicable to All Purposes

Use of this standard requires compliance with all applicable federal, state, and local laws and regulations.

Capacity. Identify the type of livestock or wildlife that will be the primary user(s) of the facility. If the watering facility will supply water to different species of animals, provide sufficient water to meet the sum of the seasonal high daily water requirements of all the animals.

For wildlife, base water quantity and quality requirements on targeted species needs.

User Needs. Design the watering facility so that access is adequate to accommodate the number of animals that will be drinking at the same time. Include design elements to meet the specific needs of the primary user(s).

Stabilization of Disturbed Areas. Vegetate or stabilize areas disturbed by construction in accordance with the planned use of the facility. Use the criteria in Indiana (IN) Field Office Technical Guide (FOTG) Standard (342) Critical Area Planting to establish vegetation. If establishment of vegetation is precluded by site conditions, use the criteria in Indiana (IN) Field Office Technical Guide (FOTG) Standard (484) Mulching, as appropriate.

Troughs and Tanks

Capacity. Design the watering facility with the storage volume necessary to provide water between periods of replenishment. Base the additional storage volume on the availability of water, replenishment rate, location, and planned operation.

Location. Locate the watering facility to meet the needs of the managed livestock or wildlife species. Locate facilities to promote even grazing distribution and reduce grazing pressure on sensitive areas. Where multiple watering facilities are planned, place the watering facilities at distances that are appropriate for the species that will be managed.

When possible, locate the watering facility away from streams, ponds, or riparian areas to

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minimize chance of contamination from fecal contamination or surface pollution.

When a watering facility is installed adjacent to a well, provide positive drainage away from the well head.

Foundation. Install the watering trough or water storage tank on a firm, level foundation that will not settle differentially. Examples of suitable foundation materials are bedrock, concrete, compacted gravel and stable, well-compacted soils. Where necessary, prepare the foundation by removal and disposal of materials that are not adequate to support the design loads.

Anchor or brace the watering facility to prevent overturning by wind and animals, if needed.

Stabilization. For a fixed trough, protect the area around the watering facility where animal concentrations or overflow from the watering facility will cause resource concerns. Use criteria in IN FOTG Standard (561) Heavy Use Area Protection to design the protection.

For a portable facility, move the trough frequently to prevent damage from animal concentrations. Portable facilities are expected to be utilized in multiple locations and should be designed for ease of movement.

Tanks. Analyze the foundation conditions and provide a design that will ensure the stability of the storage tank. For a vertical storage tank with a tank height greater than the tank diameter, also analyze the potential for overturning and identify the anchoring requirements.

Use NRCS design procedures or manufacturer's guidelines to ensure that buried tanks will withstand all earth and vehicle loads anticipated for the site.

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.

The following are guidelines for materials commonly used for watering facilities.

Concrete	4000 psi compressive strength at 28 days, 3 inch thick walls and floor, and minimum 14-gauge welded wire reinforcing
Galvanized Steel	20 gauge thickness
Plastic	Ultraviolet resistance
Fiberglass	Ultraviolet resistance
Large equipment tire	Suitable to perform as intended for life of practice, and free of chemicals

Design will include appropriate safety features to minimize the hazards of the facility.

Appurtenances. Use the criteria in IN FOTG Standard (516) Livestock Pipeline to design pipe associated with the watering facility and to size the tank with the appropriate pipe size to provide adequate water to meet daily requirements. Include backflow prevention devices on facilities connected to wells or to domestic or municipal water systems.

Provide a stable outlet for the overflow pipe when an overflow pipe is included in the design. Protect the outlet from damage. Direct overflow from the trough to another beneficial use or to the original watercourse, where possible.

Where water is supplied under pressure to the watering facility, use an automatic water level control or float valve to control the flow of water to the facility in order to reduce energy use and prevent overflows.

As needed, install a float valve on a gravity-fed trough to avoid draining the water source.

Protect valves and controls from damage by livestock, wildlife, freezing, and ice.

Escape Features. Install escape features where local knowledge and experience indicate that wildlife may be at risk of drowning.

An effective escape device must:

- Meet the inside wall of the tank or trough

- Reach to the bottom of the trough or tank
- Be firmly secured to the trough rim
- Be built of durable material with a rough surface animals can grip
- Have a slope no steeper than 45 degrees
- Be located to cause minimal interference with livestock

Provide one escape device for every 30 linear feet of rim.

Refer to *Water for Wildlife – A Handbook for Ranchers and Range Managers*, Bat Conservation International, for additional information on escape features.

Watering Ramps

Where livestock or wildlife will drink directly from a pond or stream, use a watering ramp to provide a stabilized access to the water. Evaluate the existing and proposed fences, grazing patterns, shoreline slope, and water depth when choosing the optimum location for the ramp.

Width. Make the ramp wide enough to accommodate the expected usage.

Length. Extend the ramp into the stream or pond far enough to achieve the desired depth.

Surface drainage. Divert surface runoff from the approach to the ramp.

Slope. Make the slope of the watering ramp consistent with planned animal usage but not steeper than 3:1.

Side slopes. Make all side slope cuts and fills stable for the soil materials on the site. Make the side slopes of cuts or fills in soil materials no steeper than 2 horizontal to 1 vertical (2:1). Make rock cuts or fills no steeper than 1.5 horizontal to 1 vertical (1.5:1).

Foundation. Where necessary, prepare the foundation by removal and disposal of material that are not adequate to support the design loads.

Surface material. Use the criteria in IN FOTG Standard (561) Heavy Use Area Protection to design the ramp surface. The selected material must be of adequate quality to withstand underwater conditions.

Access. Use fencing or other barriers to delineate the boundaries of the ramp. Use IN FOTG Standard (382) Fence for the design and construction of a fence. Barriers must be of sufficient size, strength, and quality to meet the intended use of the facility.

Ramps in Streams. Use the criteria in IN FOTG Standard (578) Stream Crossing for the design and construction of a ford crossing except as noted above.

Locate the watering ramp so that it does not impede the movement of aquatic organisms in the stream.

Ramps in Ponds. A minimum water depth of 3 feet, measured from the designed permanent water level, is recommended. Where the pond depth is greater than 3 feet at the ramp location, it may be necessary to excavate the ramp into the pond bank to provide a stable base at the lower end. Extend the ramp a minimum of 0.5 feet above the designed permanent water level.

Additional Criteria When Providing Water for Livestock

The trough or tank, with delivery, will have a capacity to provide seasonal high daily water requirements of 30 gallons per day per 1000 pounds live weight for the number and species of animals to be supplied.

The site will be naturally adequately drained or drainage measures will be provided.

Nose pumps, when utilized, will be anchored to prevent movement and/or damage by livestock. Nose pumps will be located within 500 feet of the grazing livestock and a maximum number of 25 cattle per pump.

Additional Criteria When Providing Water for Wildlife

This standard will only be used in areas where a lack of adequate water has been identified as a limiting habitat component for the target wildlife species.

Domestic livestock will be excluded from the facility unless specified in an approved grazing plan. See IN FOTG Standards (528) Prescribed Grazing or (472) Access Control for design criteria.

Wildlife watering facilities will be spaced no closer than one-quarter mile from one another or to a dependable quality water supply.

Management measures will be provided to control invasive species.

Disturbed areas will be vegetated according to a revegetation plan, utilizing rates and species from the [IN NRCS Seeding Tool](#), or the [IN Biology Technical Note - Upland Wildlife Habitat](#). Where spillway protection is needed See IN FOTG Standard (342) Critical Area Planting will be used.

To maximize wildlife use, watering facilities will either be placed within wooded areas or as close to a field edge as feasible.

The maximum water depth will not exceed 5 feet, but will maintain a depth of at least 2 feet during the driest part of the year.

At least one interior side slope will be 4 horizontal to 1 vertical (4:1) or flatter to allow easy wildlife access. All other interior side slopes on embankment structures will be no steeper than 2:1. Exterior side slopes will be no steeper than 3:1.

Surface runoff basins with earth embankments intended to store more than 3 feet of water against the embankment will be designed according to IN FOTG Standard (378) Pond.

CONSIDERATIONS

The considerations section contains information that is optional to the planner.

Not all species need or benefit from supplemental water. Consider impacts to both target and non-target wildlife species before installation of a watering facility. Observed or documented use of a facility by wildlife does not necessarily indicate net benefits. Introducing a new water source within an ecosystem can have effects such as the concentration of grazing, predation, entrapment, drowning, disease transmission, and expansion of the wildlife populations beyond the carrying capacity of the available habitat. Providing a water source for wildlife could enhance the habitat for species that compete with or prey on at-risk species.

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 it.

Consider designing the facility to benefit wildlife. Such designs would include providing ground-level access to water for species that cannot use raised structures such as troughs. Ground-level access can be provided through creation of an overflow collection area or a secondary ground-level water source. Depending on the target species, planners may want to consider protecting these areas through the use of suitable fencing (marked as needed) that excludes livestock and larger wildlife species while allowing access of the site to small ground-dwelling species.

Consideration should also be given to prevention of disease transmission at watering facilities. Suitable controls/treatments for water-transmissible diseases and parasites should be considered if they are a problem locally.

When windmill, solar, or other potentially unreliable power source is used, supply additional daily water storage volume (3-5 days), provide a battery back-up system or provide an alternate water source. Use of a float valve on a system with one of these types of power supply may not be practical.

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.

Consider the effects of water development on the balance or budget of water resources in the area of the new project. In some settings, this could be important and may result in effects to adjacent or associated habitats and species.

If there is the potential for small livestock, such as lambs or kids, to fall into the trough, provide a ledge or similar structure in the trough to provide an escape route or provide a second trough that has a shorter height.

Design fences associated with the watering facility to allow safe ingress and egress 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.

Livestock. Where rotational grazing is practiced or planned, use portable watering when practical that can be relocated to disperse impacts from trampling vegetation. To ensure maximum uniform grazing and waste distribution in the pasture, livestock should not travel more than 600 feet to the watering facility. For lactating animals, watering facilities should be located within 500 feet of where they are grazing. It is ideal for the facility to be in sight from the majority of the grazing area.

Where livestock are traveling more than 1200 feet from where they are grazing and/or where watering facilities are not visible from the grazed area, larger tanks capable of handling a minimum of 1/3 of the entire herd should be utilized providing 15 inches of space per animal for 1/3 of the herd for larger livestock and 10 inches of space per animal for 1/3 of the herd for smaller livestock.

Where possible, a watering facility can provide water for two to four pastures. Watering facilities should be located to aid in additional subdivisions. Gates or gaps can be placed adjacent to the watering facility to allow livestock access to the entire facility from any one paddock at one time.

Livestock prefer drinking water temperatures from 37 to 65 degrees Fahrenheit. When using portable tanks with hoses or above ground pipe, keep the pipe or hose covered with forage or very short to prevent excess heating of the water.

Wildlife. Consider planting and maintaining vegetation that will provide shade and protective cover over or near the watering facility.

Consider any effects upon natural springs/wetlands and associated unique flora and fauna.

Consider constructing one interior side slope of 6:1 or flatter when reptiles and amphibians are a target species.

Consider adding a dead snag, tree stump or log, 10" or greater in DBH, to each restored basin to provide structure and cover for wildlife and a carbon source for food chain support.

Consider placing rock piles near the water's edge to provide critical habitat for reptile and amphibian species. See 645 - Upland Wildlife Habitat Management - [Wildlife Brush Pile Job Sheet](#) for more details.

Watering ramps. Where livestock exclusion from a stream is part of the planned installation, consider installing a watering ramp that can be used if emergency access to water is needed. Use a gate to restrict access to the ramp.

The slope of the ramp can influence animal behavior. Steeper slopes tend to discourage loitering in the ramp area.

Select a surface material for the ramp that will discourage loitering but still provide a stable footing. The larger stone will make the hoof contact slightly uncomfortable.

Avoid locating watering ramps in shady places where possible.

It is difficult to put a fence in the middle of a stream. Where possible, extend the fence completely across the stream. Swinging gates can be used to restrict animal movement.

PLANS AND SPECIFICATIONS

Plans and specifications will be prepared for the practice site. Plans will include the following:

- Type and number of animals expected to use the facility
- Plan view
- 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
- Cross section (typical or other)
- Construction specifications describing the installation of the facility

- Materials and quantities

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:

- Regularly check for damage to the facility. Check for leaks, site erosion, and damage to fences, heavy use areas, and appurtenances associated with the watering facility. Repair or replace damaged components, as needed.
- A monitoring schedule to ensure maintenance of adequate inflow and outflow;
- If present, the checking of the automatic water level device to ensure proper operation;
- If present, checking to ensure the outlet pipe is freely operating and not causing erosion problems;
- A schedule for periodic cleaning of the facility.
- Prepare the facility for winter as dictated by the climate. This may include draining supply pipes, emptying tanks, or ensuring that float valves will not be damaged by ice.
- For a portable facility, include the plan for moving the facility and for monitoring/repair of the areas around the facility.

REFERENCES

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