

**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.

Placement of watering facilities shall allow for livestock access around the entire facility where practical.

Design the watering facility to provide adequate access to the animals planned to use the facility.

PURPOSE

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

- Meet daily water requirements
- Improve animal distribution

Incorporate escape features into the watering facility design where local knowledge and experience indicate that wildlife (e.g. birds, bats and other small animals) may be at risk of drowning. See Taylor & Tuttle, 2007, for designs of escape structures and IL standard drawing IL-ENG-88B.

CONDITIONS WHERE PRACTICE APPLIES

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

Include design elements to meet the specific needs of the livestock and/or wildlife that are planned to use the watering facility.

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

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. Designs are to be based on 30 gallons/day/animal unit. Include the storage volume necessary to provide water between periods of replenishment. Refer to the Illinois Pipeline design program – version 4.9 for storage requirements, refill rates, trough sizes, distance to water, etc. For wildlife, base water quantity and quality requirements on targeted species needs.

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.

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, freezing and ice damage.

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

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 follow industry standards where NRCS standards do not exist.

Use the criteria in NRCS Conservation Practice Standard Pipeline (Practice Code 516) to design piping associated with the watering facility. Include anti-siphon valves, check valves, or backflow prevention devices on facilities connected to wells, domestic or municipal water systems as required.

Disturbed areas shall be vegetated according to a revegetation plan. Use NRCS Conservation Practice Standard Pasture and Hay Planting (Practice Code 512) or Conservation Cover (Practice Code 327) to design the revegetation plan unless the area is subject to frequent overflows or spillway protection is needed, then NRCS Conservation Practice Standard Critical Area Planting (Practice Code 342) will be used.

Where water supplies are dependable and livestock are checked daily, troughs with little water storage capacity may be used. Troughs or tanks must provide the daily water requirement of livestock and wildlife and provide access to the entire herd within a short period of time, refer to NRCS Conservation Practice Standard Pipeline (Practice Code 516).

Automatic water level control and/or overflow facilities shall be provided as appropriate. Valves or pipes shall be protected by shields or covers to prevent damage by livestock or wildlife. Overflow shall be piped to a stable or suitable point of release. The trough and outlet pipes shall be protected from freezing and ice damage or drained when not in use. Freeze-proof troughs or electric heaters may be used.

When a roof is placed over the trough 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, refer to Conservation Practice Standard Waste Storage Facility (Practice Code 313).

Linear access for cattle will be based on 24 inches per head, while sheep and goats will be calculated on 12 inches per head. Where trough access is being calculated for horned cattle the linear access will be based on either: 1) the average width of the animal's horns from tip to tip times the number of livestock to drink at one time (ie. Longhorn cattle with 55 inch horn span X 3 = 165 inches / 3.14 = 52.5 inch diameter or 13.75 feet of facility access for 3 head) or 2) multiple smaller watering facilities with 30 feet between facilities and 360 degree access.

Additional Criteria for Wildlife Watering Facility

Wildlife watering facilities are generally simple earthen dugouts or dugout/embankment structures with low embankment heights (usually less than 3 feet). All earthen wildlife watering facilities will be designed according to the NRCS Conservation Practice Standard Pond (Practice Code 378). Additional protection with rock and concrete pads is usually not required. Additional criteria for dugout/embankment wildlife watering facilities include:

- Locate where livestock are not present. Wildlife watering facilities are not designed for livestock watering use.
- Locate at least one half mile apart or no closer than one half mile to a dependable quality water supply.
- The revegetation plan will specify seed mixtures that will not impede wildlife access or decrease habitat quality. Native plant materials will be used whenever possible to achieve the desired purpose.
- Maximum water depth will not exceed 6 feet. Watering facilities are not designed for fish habitat.
- Water surface area of at least 150 square feet.
- Water depth of at least 3 feet over half of the area.

- At least one slope must permit wildlife to enter and leave easily (6:1 or flatter slope).

Spring developments for wildlife watering facilities shall meet the requirements of Conservation Practice Standard Spring Development (Practice Code 574). The reliability and quantity of the flow will be checked before development of a spring or seep to serve as a wildlife watering facility. Intermittent springs will be developed only if adequate checks show that water is available for the intended periods of use. Providing large capacity storage to assure an adequate water supply when the intermittent spring stops flowing is advisable. Improvements for wildlife involving intermittent springs and seeps will contain a minimum storage of 50 gallons of water.

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, fencing should be made highly visible by avoiding the use of single wire fences and instead 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, 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 regulate 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. Carefully choose the location of watering facilities to minimize problems from steep topography.

PLANS AND SPECIFICATIONS

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

- A map or aerial photograph showing facility location
- Detail drawings showing the facility, necessary appurtenances (such as foundations, pipes and valves) and stabilization of any areas disturbed by facility installation
- Construction specifications describing facility installation

Refer to Construction Specification included in NRCS Conservation Practice Standard Pond (Practice Code 378) for all earthen wildlife watering facilities that have been designed according to Practice Code 378.

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:

- create a monitoring schedule to ensure maintenance of adequate inflow and outflow;
- check for leaks and repair as necessary;
- if present, check the automatic water level device to ensure proper operation;

- check to ensure that adjacent areas are protected against erosion;
- if present, check to ensure the outlet pipe is freely operating and not causing erosion problems;
- establish a schedule for periodic facility cleaning
- guidance for winter weather, such as adding material in the storage area to allow for ice expansion without damage or draining system

Donald Pfof; James Gerrish, Maurice Davis, Mark Kennedy. 2000. Pumps and Watering Systems for Managed Beef Grazing.

Refer to Operation and Maintenance included in NRCS Conservation Practice Standard Pond (Practice Code 378) for all earthen wildlife watering facilities that have been designed according to Practice Code 378.

REFERENCES

Brigham, William and Stevenson, Craig, 1997, Wildlife Water Catchment Construction in Nevada, Technical Note 397.

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

National Range and Pasture Handbook, Chapter 6, USDA-Natural Resources Conservation Service.

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

Taylor, Daniel A.R., Merlin D. Tuttle. 2007. Water for Wildlife a Handbook for Ranchers and Range Managers. Bat Conservation International.

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.

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.

NATURAL RESOURCES CONSERVATION SERVICE
ILLINOIS OPERATION AND MAINTENANCE

WATERING FACILITY
(TANKS AND TROUGHS)

(No.)

CODE 614

Operation and maintenance for the system is the responsibility of the producer. The tank or trough shall be inspected frequently. Some of the items that need to be addressed are:

Check periodically to see if any type of debris has fallen into the trough that may restrict the inflow or outflow system.

Check tank for leaks or cracks and repair immediately if any cracks or wall separations are found.

Check the automatic water level device to ensure that it is operating properly.

Inspect the outlet pipe to be sure it has a free outlet and is not causing any serious erosion problems.

If the trough has not been designed to prevent damage from freezing, it should be prepared for winter

weather, which may include adding material in the storage area to take up expansion.

Algae and iron sludge sometimes are problems in watering facilities. Chemicals such as copper sulfate and chlorine have been used. Federal state, and local rules and regulations are to be followed when recommending chemicals.

Check for vandalism and normal wear and deterioration. Repair any damage that would prevent the system from working properly.

Remove large accumulations of manure at or near the tank or trough.

Inspect the condition of the pad or surfaced area around the tank or trough for deteriorating condition and repair or replace materials, as needed.

Additional Items:

**NATURAL RESOURCES CONSERVATION SERVICE
ILLINOIS CONSTRUCTION SPECIFICATION**

WATERING FACILITY

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Scope

The work shall consist of all construction operations and furnishing all materials as required by the drawings and specifications for the complete installation of a watering facility. The facility may be a tank, trough, manufactured waterer (fountain), or other suitable device.

Location

The location of the watering facility shall be as shown on the construction plans as staked in the field.

Site Preparation

The foundation area shall be cleared of vegetation, boulders, rubbish, or other materials not suited as subgrade material.

The foundation and surrounding area shall be smoothed and graded to permit free drainage of surface water.

Concrete shall be placed on well-drained, firm subgrade consisting of firmly compacted sand, gravel, or earth. If the soil is a highly plastic material subject to significant swelling, a minimum 4-inch layer of sand or fine gravel shall be placed between the sub-base material and the concrete.

Fiberglass tanks shall set on a base made of at least 4 inches of sand or fine gravel unless a heavy use area is constructed. Precast concrete tanks shall be placed on a smooth earth or sand surface capable of making contact with the entire base of the tank.

Waste material from the construction operation such as rocks, frozen soil, mud,

roots, logs, or rubbish shall be disposed of by piling or burying at locations outside the work area or as directed by the technician.

Heavy Use Area

The area around watering facilities shall be protected with a heavy use area extending at least 10 feet around the trough (5 feet minimum for sheep or goats). The heavy use area shall meet NRCS Conservation Practice Standard Heavy Use Area Protection (Practice Code 561). The heavy use area around the watering facility shall be constructed according to the design plans.

Materials

All materials shall have a life expectancy of at least 10 years.

Tanks shall be as shown on design plans. Tanks shall be durable enough to withstand forces exerted by water, soil, and livestock.

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.

Automatic fountains or frost free waterers shall be installed following the manufacturer's recommendations for placement and installation. Refer to standard drawing IL-ENG-86

Concrete shall have a minimum design strength of 4000 pounds per square inch (psi) at 28 days. Concrete shall be prevented from drying for a curing period of at least 7 days after placed. Exposed surfaces shall be

