

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

WATER HARVESTING CATCHMENT

(No.)

CODE 636

DEFINITION

A facility for collecting and storing runoff from precipitation.

PURPOSE

Provide water for livestock, fish, wildlife, and/or other purposes by sealing of the watersheds or contributing areas to increase, collect, and store runoff water for future use.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to areas where there is a need for additional water. The contributing area shall have a potential to furnish the quantity and quality of water required for the intended use.

It also applies to simple curbs and diversions constructed to collect and store runoff from such high runoff areas as rock outcrops or existing paved or impervious areas.

It can also be a structure developed to store water collected from roof runoff or a natural spring development.

FEDERAL, STATE, AND LOCAL LAWS

Design and construction activities shall comply with all federal, state and local laws, rules and regulations governing pollution abatement, health and safety. The owner or operator shall be responsible for securing all required permits or approvals and for performing in accordance with such laws and regulations. NRCS employees are not to assume responsible for procuring permits, rights or approvals or for enforcing laws and
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regulations. NRCS may provide the landowner with technical information to obtain permits or rights of way. Permits may be required from the following agencies:

- 1. West Virginia Department of Health***
- 2. West Virginia Department of Agriculture***

CRITERIA

Each water-harvesting catchment shall be designed according to a plan suited to the water requirements and the site conditions. The following points shall be considered in designing water-harvesting catchments:

1. The area of the apron shall be large enough to yield the required amount of runoff from the expected storms.
2. The apron shall be smooth and impervious to insure that adequate runoff occurs. Compacted earth, treated earth, wax, rubber, plastic, asphalt, concrete, steel, and other such suitable materials are acceptable for this purpose.
3. Foreign runoff shall be diverted from the catchment area to prevent damage and excessive sedimentation.
4. An overflow pipe or auxiliary spillway will be installed to prevent damage to the apron from runoff in excess of that needed to maintain the design capacity of the conveyance system. A sediment trap will be installed between the apron and the storage basin.
5. The storage basin shall be of adequate size, impermeable, and durable to hold

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water for the intended purpose. Earth basins and tanks constructed of steel, concrete, butyl rubber, and similar facilities are acceptable. Earth dams shall have at least 1 foot of freeboard above the design high water **or according to CPS Pond (378) which ever is greater.** All storage basins shall be protected from 10-year-frequency storms. An overflow device shall be installed in all storage basins.

6. The apron and storage areas shall be protected from damage by weather, animals, vandals, wildlife, and traffic. Fencing shall be installed as necessary.
7. ***If the collected water is pumped from a sump to a catchment structure, the structure shall be on ground higher than the surrounding area or the surface shaped to prevent uncontrolled surface water from entering the structure. It should be as close to the point of ultimate use as possible.***
8. ***If the catchment structure receives water from a spring, document the back up source of water, local knowledge of spring and that the spring may not be reliable throughout a drought year.***
9. ***The storage volume of the structure for livestock should meet the projected livestock needs for summer period. A minimum of seven days water storage is required if the flow rate is less than 2 gallons per animal per hour and 5 days storage capacity if the flow rate is greater or equal to 2 gallon per animal per hour. In no case shall the storage capacity be less than 1200 gallons.***

<i>Livestock water needs are as follows</i>	
<i>Animal (1000 lbs)</i>	<i>Water Needs (gal.day)</i>
<i>Dairy Cow</i>	<i>35</i>
<i>Beef</i>	<i>20</i>
<i>Horse</i>	<i>12</i>
<i>Swine</i>	<i>15</i>
<i>Sheep/Goats</i>	<i>15</i>
<i>Poultry</i>	<i>35</i>

10. ***If the collected water is for irrigation, the size of the structure should meet minimum irrigation criteria for the crop. If needed for supplemental organic irrigation needs. Refer to WV Guide for Sprinkler Irrigation –Dec. 1970 to determine crop needs. The minimum storage shall be for the seasonal anticipated water use as noted in Table 6 of the above report plus estimated seepage, evaporation and irrigation efficiency losses. Allowances should be determined for the type of irrigation delivery system anticipated efficiency.***

CONSIDERATIONS

Water Quantity

1. ***Effects on the water budget, especially on localized rates and volumes of runoff.***
2. ***Where applicable, consider the effects of snow catch and melt on the water budget.***

Water Quality

1. ***Effects of erosions and sediment yield from disturbed area during construction.***
2. ***Effects on the quality of water supply for livestock consumption and irrigation.***

Consider the effects the practice has on surface and ground water. Factors may include changes in evaporation, timing of releases from the catchment, and the impact of the type of catchment on surface water versus ground water.

Evaporation control measures may be needed to insure that adequate storage capacity is maintained.

Consider covered storage and/or storage tanks to store runoff.

PLANS AND SPECIFICATIONS

Structural Details

Below Ground Tanks

Below ground tanks developed for water storage shall be made from commercial

grade polyethylene HDLPE and labeled for water storage.

Document site location, soil, water table height, buoyancy (assuming tank is empty) and necessary protection.

Do not bury tanks in soils with high water tables unless a buoyancy compensation is calculated and compensation added as needed, but in no case in soils with a watertable less than 12" from the surface.

The basin shall be equipped with a manhole opening to permit entrance for cleaning purposes. The manhole cover shall fit tightly to prevent entrance of dust, light, surface water, animals, etc. The structure shall be equipped with a 1-1/4 inch drainpipe and valve system. It shall be designed to withstand the loading requirement for the site selected.

Protect the water holding facility by a fence or other means.

Refer to conservation practice standard 614 Watering Facilities for additional information on concrete or plastic tanks.

Include and follow manufactures recommendations for installation, protection and maintenance.

Above Ground Tanks

Above ground tanks should be protected from ultra-violet, be black or dark color to prevent light penetration, be labeled for water use only.

Place tank on a minimum of 6' x 6' bottom or extend 1.0 past the outside rim of the the tank. The foundation shall be a minimum 4" thick concrete (4000 psi) foundation with 6" x 6"-8 gauge x 8 gauge (W2.1 x W2.1) wire reinforcement.

Bolt and/or tie down tank to prevent movement due to wind or accidental contact and as recommended by manufacture.

The basin shall be equipped with a drain and opening to permit cleaning and draining of structure.

Document site location, soil, water table height and necessary protection.

Protect water holding facility by a fence or other means.

Refer to conservation practice standard 614 Watering Facilities for additional information on concrete or plastic tanks.

Include and follow manufactures recommendations for installation and maintenance.

Materials

Watertight construction materials such as reinforced concrete steel, masonry coated with a water-repellent compound, polytanks (designed to store potable water not wastewater) shall be used.

Inlet or outlet pipes through the walls shall be steel, copper or SDR 26 PVC or heavier.

The minimum wall thickness for rectangular concrete structures shall be beveled from 4 inches (top) and 6 inches at the (bottom) and have a minimum 6" bottom, 6" x 6" - 8 gauge x 8 gauge (W2.1 x W2.1) wire reinforcement. Round tanks shall be a minimum of 4" thick bottom and 3" sides.

Galvanized steel tanks shall be a minimum thickness of 20 gauge

All tanks shall be placed on a minimum of 4" sand or pea gravel under the tank and on firm ground or compacted foundation.

Plans and specifications for water-harvesting catchments shall be in keeping with this standard and shall describe the requirements for installing the practice to achieve its intended purpose.

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OPERATION AND MAINTENANCE

An O&M plan specific to the type of installed water-harvesting catchment shall be provided to the landowner. The plan shall include, but not be limited to, the following provisions:

1. Inspecting and testing valves, pumps, and other appurtenances;
2. Maintaining erosion protection at outlets;
3. Checking for debris, minerals, algae and other materials that may restrict system flow;
4. Draining and/or providing for cold weather operation of the system;
5. Controlling all vegetation, wildlife, rodents, or burrowing animals from the apron;
6. Maintaining all fences to prevent unauthorized human or livestock access; and
7. Inspecting the catchment area/ **facility** for signs of ultraviolet degradation of flexible materials.
8. ***Repair any facility damage promptly to prevent loss of water.***
9. ***Drain water from above ground tanks during periods of non-use or during winter.***

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