

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
SOUTH DAKOTA SUPPLEMENTS ITALICIZED**

IRRIGATION SYSTEM, TAILWATER RECOVERY

(no.)
CODE 447

DEFINITION

A facility to collect, store, and transport irrigation tailwater for reuse in a farm irrigation distribution system.

PURPOSE

To conserve farm irrigation water supplies and water quality by collecting the water that runs off the field surface for reuse on the farm.

This standard applies to the planning and functional design of irrigation tailwater recovery systems, including pickup ditches, sumps, pits, and pipelines. It does not apply to detailed design criteria or construction specifications for individual structures or components of the recovery system.

CONDITIONS WHERE PRACTICE APPLIES

Tailwater recovery systems are suitable for use on sloping lands that are served by a properly designed and installed surface irrigation system to facilitate the conservation use of soil and water resources. They are also suitable for use in areas where recoverable irrigation runoff flows or can be anticipated under the management practices used or expected to be used.

CONSIDERATION

Water Quality

Effects on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, and deep percolation, and ground water recharge.

Effects on downstream flows or aquifers that would affect other water uses or users.

Effects on the volume of downstream flow that could cause undesirable environmental, social, or economic effects.

Potential use of irrigation water management.

Water Quality

Effects on the movement of sediment and soluble and sediment-attached substance on downstream water carried by runoff.

Effects of nutrients and pesticides on surface and ground water quality.

Effects on the movement of dissolved substances to ground water.

Effects on wetlands or water-related wildlife habitats.

Effects on the visual quality of water resources.

Laws and Regulations. *This practice must conform to all federal, state, and local laws and regulations. Laws and regulations of particular concern include those involving water rights, land use, pollution control, property easements, wetlands, preservation of cultural resources, and endangered species.*

CRITERIA

All irrigation systems shall be operated in accordance with an Irrigation Water Management (IWM) Plan. IWM Plans shall be in accordance with the South Dakota Standard for Irrigation Water Management - Code 449.

Collection facilities. Facilities for the collection of irrigation tailwater *must be* an integral part of the irrigation system.

Sump or pit. A sump or pit is needed to store the collected tailwater until it is redistributed in the farm irrigation system. The desired control of water at

<p>Conservation practice standards are reviewed periodically and updated if needed. The current version of this standard is posted on our website at www.sd.nrcs.usda.gov or may be obtained at your local Natural Resources Conservation Service.</p>
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the point where the tailwater is returned to the irrigation system shall be considered in determining the size of the sump.

Small sumps with frequently cycling pumping plants may be used where the tailwater discharges into an irrigation regulation reservoir or into a pipeline with the flow controlled by a float valve. However, if the irrigation distribution system does not include facilities for regulating fluctuating flows, tailwater sumps shall be made large enough to provide the regulation needed to permit efficient use of the water.

Sumps must be equipped with inlets designed to protect the side slopes and the collection facilities from erosion. A dike or ditch shall be provided if necessary to limit the entrance of surface water to the designed inlet. Sediment traps shall be installed if needed.

Return facilities. All tailwater recovery systems require facilities of some kind to convey the tailwater from the storage sump to the point of reentry into the farm irrigation system. These facilities may consist of a pump and pipeline to return the water to the upper end of the field, or they may consist of a gravity outlet having a ditch or pipeline to convey the water to a lower section of the farm irrigation system.

The capacity of return facilities shall be determined by an analysis of expected runoff rates, the proposed sump storage capacity, and the anticipated use to be made of the tailwater.

If the return flow is used as an independent irrigation stream rather than as a supplement to the primary irrigation water supply, the rate of flow must be adequate for the methods of water application employed.

Structure components. *The specific structure components of a tailwater recovery system shall be designed according to the applicable practice standard for that practice.*

Vegetative Cover, Fencing and Riprap. *All disturbed areas must be seeded following completion of construction. Fencing must be provided where necessary to protect vegetation and control grazing.*

Riprap must be included where needed to control erosion.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared to show site specifics. The drawings and specifications shall show location, sizes, and construction details for the sump or pit, pumping plant requirements if applicable, sizes, and construction details for return facilities.

OPERATION AND MAINTENANCE

The operation and maintenance of the system shall include typical items of removing or controlling undesired vegetation, repairing banks, removing sediment from sumps or pits, repairing return facilities, etc.

REFERENCES

Engineering Field Manual, Chapter 3, Hydraulics and Chapter 15, Irrigation.

Technical Release 25, Design of Open Channels.

NRCS Conservation Practices Structure for Water Control (587), Irrigation System, Surface and Subsurface (443), and Irrigation Pit or Regulating Reservoir (552).