NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

DRAINAGE WATER MANAGEMENT
(Acre)
CODE 554

DEFINITION

Control of water surface elevations and discharge from surface and subsurface drainage systems.

PURPOSES

The purposes of this practice are to:

- Improve water quality;
- Improve the soil environment for vegetative growth;
- Reduce the rate of oxidation of organic soils;
- Prevent wind erosion;
- Enable seasonal shallow flooding;
- Conserve Water.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where:

- The topography is relatively smooth, uniform, and flat to gently sloping;
- A water table may be maintained without excessive seepage and without having an adverse impact on adjoining properties.

CRITERIA

General Criteria Applicable To All Purposes

The system shall be designed to remove the water required for adequate drainage. The rate of outflow and the level of the water table shall be controlled by structures or pumps. Water velocities in the soil near the drain shall be kept slow enough to prevent soil particles from entering the drainage system.

Structures and pumps shall be located where they are accessible and subject to convenient control. Designs of critical components shall be in accordance with pertinent NRCS Practice Standards.

Additional Criteria To Improve Water Quality

The system shall prevent automatic discharge of storm water during minor rainfall events. The controlled discharge of excess water shall account for water not otherwise removed by evapotranspiration and seepage. The uniformity of storm water draw down shall be improved throughout the areas influenced by the designed system. The distance the water must travel in surface ditches before it reaches the main discharge point shall be maximized when practical.

Additional Criteria To Conserve Water

The system will be designed to control the water table between predetermined elevations at all points in the design area when the system is being used for sub-irrigation to encourage ground water use by the crop.

Additional Criteria To Improve Soil Environment For Vegetative Growth

The combined capacity of the surface and subsurface facilities shall satisfy the appropriate drainage coefficient for the crops to be grown. The water table shall be held between predetermined elevations at all points in the design area when the system is being used for sub-irrigation.

Additional Criteria To Reduce The Rate Of Oxidation Of Organic Soils

Drainage beyond that necessary to provide an adequate root zone for a crop shall be kept to a minimum. When practicable, the water table shall be raised to the surface, or to a designated maximum elevation, for a sufficient time to return the saturated zone to anaerobic conditions. The implementation of this practice must result in a reduced average annual thickness of the aerated layer of the soil.

Additional Criteria To Prevent Wind Erosion

The system shall provide sufficient moisture to the soil surface, either by ponding or capillary action, to prevent wind erosion when there is insufficient organic residue or plant material on the surface.

Additional Criteria To Enable Seasonal Soil Saturation Or Shallow Flooding

The system shall provide saturation to the surface or shallow flooding for a sufficient time to accomplish the desired pest control, provide wildlife habitat, or reduce the rate of oxidation of organic soils.

CONSIDERATIONS

An adequate water supply should be available when it is necessary to raise the water.

The effect of drainage systems on wetlands should be evaluated.

Maintaining a high water table, especially in arid areas, may not be appropriate due to salinity/alkalinity.

Cultural Resources Considerations

NRCS's objective is to avoid any effect to cultural resources and protect them in their original location. Determine if installation of this practice will have any effect on any cultural resources.
Document any specific considerations for cultural resources in the design docket and the Practice Requirements worksheet.
GM 420, Part 401, the California Environmental Handbook and the California Environmental Assessment Worksheet provide guidance on how the NRCS must account for cultural resources. The Field Office Technical Guide, Section II contains general information, with Web sites for additional information.

Endangered Species Considerations

Determine if installation of this practice, along with any others proposed, will have an effect on any federal or state listed Rare, Threatened or Endangered species or their habitat. NRCS's objective is to benefit these species and others of concern, or at least not have any adverse effect on a listed species. If the Environmental Evaluation indicates that the action may adversely affect a listed species or result in adverse modification of habitat of listed species which has been determined to be critical habitat, NRCS will advise the land

user of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the landowner selects one of the alternative conservation treatments for installation; or at the request of the landowners, NRCS may initiate consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game. If the Environmental Evaluation indicates the action will not affect a listed species or result in adverse modification of critical habitat, consultation generally will not apply and usually would not be initiated. Document any special considerations for endangered species in the Practice Requirements Worksheet.

Water Quantity

1. Effects the water budget, especially effects on volumes and rates of runoff, infiltration, evaporation, transpiration, deep percolation, ground water recharge and water supply either above or below the point of control;

2. Effects of changes in the flow of downstream water courses;

3. Potential effects on wetlands or water related wildlife habitats.

Water Quality

1. Effects of outflow on erosion in downstream water courses.

2. Effects of pesticides, salinity, nutrients and other dissolved substances on surface and ground water quality.

3. Effects of possible changes to sediment, sediment-attached substances and soil salinity.

4. Effects on downstream temperatures.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared in accordance with the criteria of this standard as necessary and shall describe the requirements for applying the practice to achieve its intended use.

OPERATION AND MAINTENANCE

An operation and maintenance plan shall be developed that will identify the intended purposes of this practice and that will identify critical dates and target elevations of the water level necessary to accomplish the intended purposes.

The plan shall also include the operation and maintenance of critical components of the infrastructure used to manage the drainage water.