

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**PUMPING PLANT FOR WATER CONTROL**

(No.)

**CODE 533**

**Definition**

A pumping facility installed to transfer water for a conservation need, including removing excess surface or ground water; filling ponds, ditches or wetlands; or pumping from wells, ponds, streams, and other sources.

**Purpose**

To provide a dependable water source or disposal facility for water management on wetlands or to provide a water supply for such purposes as irrigation, recreation, livestock, or wildlife.

**Conditions where practice applies**

Wherever water must be pumped to accomplish a conservation objective. It is especially applicable for maintaining critical water levels in existing swamps, marshes, or open water and for providing water sources for newly constructed wetlands and ponds.

**Design criteria**

The efficiency of units, type of power, quality of building, automation, and accessories installed shall be in keeping with the value and importance of the system, and shall accomplish the conservation and environmental objectives.

**Pump requirements.** The capabilities, range of operating lifts, and general class and efficiency of equipment shall be determined from appropriate technical studies. The size and number of pumps and their performance requirements shall be determined on the basis of the conservation requirements of the system. The total head shall be determined for critical operating conditions, taking into account all hydraulic losses. Automatic controls shall be included in the plans as required.

**Power units.** Power units shall be selected on the basis of availability of fuel or power costs,

operating conditions, conservation needs, and objectives, including the need for automation. The power unit shall be matched to the pump and be capable of operating the pump efficiently and effectively within the range of operating conditions. The horsepower requirements, pump efficiency and total head on the pump shall be computed.

**Suction and discharge pipes.** The size of suction and discharge pipes shall be based on studies of efficiencies and effects on costs and operations. The arrangement and length of discharge pipe shall be based on the need for recovery of head through siphoning action, and for delivery of water in keeping with conservation and environmental objectives. Gates, valves, pipe connections, discharge bays, and other protective works shall be installed, as needed, for satisfactory plant operation.

**Building and accessories.** The design of the plant and associated housing, if required, shall consider the need for protecting equipment from the elements, malicious damage, and fire and the need for equipment maintenance and repairs. The appearance of the plant shall be in keeping with its surrounding environment and its importance of or value.

The foundations shall be designed to safely support the loads imposed. Sheet piling or other measures shall be used, as required, to prevent piping beneath the foundation. Pumps may be mounted in the open, on piling or in a well or pit.

Suction bays (or sumps) shall be designed to conform to the hydraulic characteristics established by the pump manufacturer.

The discharge bay or connection with distribution system shall be ample to meet hydraulic and structural requirements. Provisions for repair or removal of pumps and engines shall be provided. Trash racks shall be provided, as needed, to exclude debris and trash from the pump.

All structural features and equipment shall

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural

**NRCS, LA  
October 2008**

provide adequate safety features to protect workers and the public against injury.

**Plans and specifications**

Plans and specifications for constructing pumping plants shall be in keeping with this standard and shall describe the requirements for properly installing the practice to achieve its intended purpose.

**Planning considerations for water quantity and quality**

*Quantity*

Effect of the pumping plant on upstream and downstream quantity.

*Quality*

1. Sediment production caused by erosion during construction.
2. Possible effects on surface and ground water of spilled fuels and lubricants used to operate and maintain the facility.

Design Criteria

Pumping Rates

Drainage pumping plants – The pumping plant shall have the capacity to remove excess water from the land as follows:

1. Cultivated land 3” in 24 hours
2. Pasture or grassland 2” in 24 hours
3. Riceland 2” in 24 hours
4. Rangeland 0.5” in 24 hours

The removal rate may be reduced by the amount of sump storage required.

Irrigation pumping plants – The pumping plant shall have the capacity to provide an adequate irrigation water supply to the area to be irrigated as determined by the Irrigation Guide. However, the pumping rate may be reduced in proportion to the amount of water stored if a storage reservoir is provided.

Wildlife Wetland Development pumping plants – The pumping plant shall have the capacity to provide complete flooding within one month after flooding starts.

**SPECIFICATION**

Design

All designs and plans shall be prepared in accordance with the Engineering Standard for Pumping Plant for Water Control.

**NRCS, LA  
October 2008**

Installation

Drainage pumping plants shall meet the requirements of Section 16 of the National Engineering Handbook.

Irrigation pumping plants shall meet the requirements of Section 15 of the National Engineering Handbook.

Checking for Completion

Pumping Plants for Water Control shall be checked for completion in accordance with procedures given in “Engineering Notekeeping, Pumping Plant for Water Control.”

**NOTEKEEPING**

Design Survey

Obtain sufficient surveys to adequately design the pumping plant for its intended purpose. These surveys may be obtained separately or in conjunction with surveys for eh associated practice, such as pumpoff drainage system, irrigation delivery system, etc. When surveys are made separately, a common datum must be used.

Surveys for drainage pumping plants should include the following information:

1. Elevation of water outside the pumpoff area for the selected frequency of protection.
2. Elevation of lowest land to be drained.
3. Elevation and size of levee.
4. Distance from pump installation to discharge area.

Surveys for irrigation pumping plant should include the following:

Elevation of high point of delivery.

Elevation of source of water. If source is a well, pumping head and capacity should be obtained from the well driller.

Distance from pump installation to discharge area.

Surveys for other type pump installations should contain similar pertinent data.

Sufficient soil borings shall be made to provide for adequate foundation design, sump design, etc. Record soils information on SCS-538.

Prepare sketch of pump installation on standard size overlay or cross-section paper showing

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural

required size and capacity of pump; total static and dynamic head with necessary elevations of such points as pump intake and discharge, and bottom of sump; horsepower requirements; etc. This information should be furnished to the farmer or contractor.

#### Construction Layout

Set enough well marked stakes to guide farmer or contractor in installation of pumping facility. Give assistance as necessary during installation to assure that an adequate job of installation is performed.

#### Construction Check

Check pump installation and verify that pump size, capacity, power requirements, intake and discharge elevations, sump size and elevation, etc. have been met. Check and verify that foundation requirements have been met.

#### Recording Data

Field notes will be recorded in bound or looseleaf notebooks. Design data may be recorded on standard size overlay or cross-section paper, or where applicable on standard forms.

#### Recording Completed Practices

Show completed pumping plant in red on field office copy of the conservation plan map, or if not available, on aerial photographs or overlay.

#### Filing Notes and Records

See National Handbook of Conservation Practices, Louisiana Supplement.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural