

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

PUMPING PLANT

(No.)
Code 533



DEFINITION

A pumping facility installed to transfer water for a conservation need.

PURPOSE

Provide a dependable water source or disposal facility for water management.

CONDITIONS WHERE PRACTICE APPLIES

Wherever water must be pumped to accomplish a conservation objective, which may include, but is not limited to any one of the following:

- To provide a water supply for such purposes as irrigation, recreation, livestock, or wildlife.
- To maintain critical water levels in swamps, marshes, open water, or for newly constructed wetlands and ponds.
- To transfer wastewater for utilization as part of a waste management system.
- To provide drainage by the removal of surface runoff water and/or groundwater.

CRITERIA

Design, installation, and operation of a pumping plant shall comply with all Federal, state, and local laws, rules and regulations.

Impact to cultural resources, wetlands and Federal and state protected species shall be evaluated and avoided or minimized to the extent practicable during planning, design and implementation of this conservation practice in accordance with established National and Florida policy, General Manual (GM) Title 420-Part 401; Title 450-Part 401, Title 190 Parts 410.22 and 410.26, National Planning Procedures Handbook (NPPH) Florida Supplements to Parts 6001 and 600.6, National Cultural Resources Procedures Handbook (NCRPH), national Food Security Act Manual (NFSAM), and the National Environmental compliance Handbook (NECH).

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

Criteria for the design of components not addressed in NRCS conservation practice standards shall be consistent with sound engineering principles.

Pump requirements. Determine capabilities, range of operating heads, and general class and efficiency of equipment by appropriate technical means. Determine size and number of pumps and their performance on the basis of system conservation requirements in order to meet the intended purpose. Determine total head for critical operating conditions, taking into account all hydraulic losses. Include automatic controls as required.

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

Size pumps utilized for the transfer of wastewater or manure to transfer material at the required system head and flow rate determined by the waste management plan. Base the pump type on the consistency of material being pumped and manufacturer's recommendations.

Power units. Select power units on the basis of availability of fuel and/or power costs, operating conditions, conservation needs, and objectives, including the need for automation. Match the power unit to the pump. Design the power unit to be capable of operating the pump efficiently and effectively within the range of operating conditions. Compute the horsepower requirements, pump efficiency, and total head on the pump.

Suction and discharge pipes. Base the size of suction and discharge pipes on a hydraulic analysis, operating cost, and compatibility with other system components. Design suction bays (or sumps) to conform to the hydraulic characteristics established by the pump manufacturer.

Design the discharge bay or connection with the distribution system to meet hydraulic and structural requirements.

Base the arrangement and length of the discharge pipe on the need for recovery of head through siphoning action, and for delivery of water in keeping with conservation and environmental objectives. Install gates, valves, pipe connections, discharge bays, and other protective devices, as needed, for satisfactory pumping plant operation.

Back flow prevention. Follow Federal, state, and local laws, rules, and regulations concerning back flow prevention when pumping from wells, or chemigating. Florida state laws applicable for back flow prevention where chemicals are applied, include Florida Statute (FS) - 487.064 and Florida Administrative Code (FAC) 5E-2.30.

Building and accessories. If the design of the pumping plant and associated housing is required, consider accessibility for equipment maintenance and repairs, and the need for protecting equipment from the elements, vandalism, and fire. Ensure the appearance of the pumping plant and associated housing is compatible with the surrounding environment, as applicable.

Provide provisions for repair or removal of pumps and engines.

Foundation. Design foundations to safely support the loads imposed. Use sheet piling or other measures, as required, to prevent piping beneath the foundation.

Mount pumps in the open, on piling, concrete foundations, in a well or pit, floating platform, or by other appropriate means.

Safety. Provide adequate safety features to protect workers and the public from injury for all structural features and equipment.

Protection. Provide trash racks, as needed, to exclude debris and trash from the pump. Vegetate all areas disturbed during construction in accordance with Florida NRCS conservation practice standard Critical Area Planting, Code 342.

CONSIDERATIONS

When planning this practice consider the following items, as applicable:

- Effects on downstream flows or aquifer recharge volumes.
- Effects on existing wetland hydrology.
- Effects on surface and ground water by leaked or spilled fuels and lubricants.
- Secondary containment of spilled fuel for water quality as may be required by Federal, state, and local laws, rules, or regulations.
- Protection of system components from "natural" events such as floods.

PLANS AND SPECIFICATIONS

Prepare the plans and specifications for installing pumping plants in compliance with this standard and describe the requirements for properly installing the practice to achieve its intended purpose.

As a minimum, include, as applicable, the following items in the plans and specifications.

- Pump location
- Size and type of pump and power unit
- Pump discharge capacity (gpm) and required head at pump discharge

- Details for mounting pump (may be left up to the manufacturer)
- Details for pump pad including dimensions, type of material, etc.
- Details of appurtenances
- Location of utilities and notification requirements.

OPERATION AND MAINTENANCE

Prepare an Operation and Maintenance plan specific to the facilities installed for use by the landowner or responsible operator. Provide specific instructions for operating and maintaining facilities to ensure the pumping plant functions properly in the plan. Include in the plan provisions to address the following, as a minimum:

- Inspection or testing of all pumping plant components and appurtenances, as applicable.
- Proper start-up procedures for the operation of the pumping plant.
- The rpm range for normal operation and associated operating pressures.
- Routine maintenance of all mechanical components (power unit, pump, drive train, etc.) in accordance with the manufacturer's recommendations.
- When applicable, the power unit, fuel storage facilities and fuel lines should be frequently checked for fuel or lubricant leaks and repaired as needed.
- Periodic checks and removal of debris as necessary from trash racks and structures to

assure adequate capacity reaches the pumping plant.

- Periodic removal of sediment in suction bays to maintain design capacity and efficiency.
- Inspect and maintain anti-siphon devices, if applicable.
- Routinely test and inspect all automation components of the pumping plant to assure they are functioning as designed.
- Inspect and maintain secondary containment facilities, if applicable.
- Periodic inspection of all safety features to ensure they are in place and functional.
- Prior to retrofitting any electrically powered equipment, electrical service must be disconnected and the absence of stray electrical current verified.

REFERENCES

Florida Administrative Code 5E-2.30
Florida NRCS Conservation Practice Standard
Critical Area planting, Code 342
Florida Statute 487.064
General Manual
Title 420-Part 401
Title 450-Part 401
Title 190-Parts 410.22 and 410.26
National Cultural Resources Procedures
Handbook
National Environmental Compliance Handbook
National Food Security Act Manual
National Planning Procedures Handbook Florida
Supplements to Parts 600.1 and 600.6