

**NATURAL RESOURCES CONSERVATION SERVICE
OPERATION AND MAINTENANCE PLAN
ARIZONA**

PUMPING PLANT

(No.)

CODE 533

Cooperator _____ Date _____

Address _____

Location: Section _____ Township _____ Range _____ Field No. _____

 Northing _____ Easting _____ **OR** Longitude _____ Latitude _____

NRCS Field Office _____ County _____

This conservation practice is an asset to your farm or ranch. This practice will need periodic operation and maintenance to maintain satisfactory performance. The life of this practice or system is at least 10 years. The life of this practice can be assured or extended by thorough and timely operation and maintenance.

GENERAL RECOMMENDATIONS

This practice will require you to perform periodic maintenance and may also require operational items to maintain satisfactory performance. Here are some recommendations to help you develop a good operation and maintenance program.

- Inspection, *maintenance* or testing of all pumping plant components and appurtenances (*valves, piping, floats, drains*), as applicable.
- Proper start-up procedures for the operation of the pumping plant.
- 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.
- Eradicate or otherwise remove all rodents or burrowing animals that have or may potentially damage any part of the delivery or application facilities. Immediately repair any damage caused by their activity;*
- Immediately repair any damage resulting from vandalism, vehicles, livestock or wildlife;*
- Protect all pumps and piping including valves that are subject to freezing. If parts of the system cannot be drained, a non-corrosive anti-freeze solution shall be added. If the system is not operated in the winter, surface pumps, intake pipes, and discharge pipes should be drained to prevent freeze damage.*

- *Keep accurate, detailed records. The records should include, at a minimum, energy consumption, and variations in noise and vibrations. Records should also include flow rate and pressure at the pump, if available.*
- *Check all pump bases and mountings regularly for durability and ability to hold the pump in place without vibration; repair when necessary. Check and tighten all bolts on the mounting structure as needed.*
- *All individual manufacturers operating and maintenance instructions shall be attached to the O&M plan upon completion of the job.*
- *Maintain grounding rods and wiring of all electrical equipment in good working condition.*
- *Provide and maintain adequate surface water drainage around the pumping plant area.*
- *Consult with the manufacturer and professional services for problems that require major work, wiring, advanced skills or equipment. Check if the problem is covered by pump warranty.*

General Pumps

- *Replace, repack, or tighten the seals when leakage is in excess of manufacturer's recommendations. Check seals, piston cup leathers, piston rod seal and foot valve for wear and replace as necessary.*
- *Check the tightness of all electrical connections in the system. Check for exposed wires and cracks or breaks in the insulation. Replace as necessary*

Windmills

- *Disable the wind pump before working on it by activating manual furling mechanism and applying the brake.*
- *For any operation involving climbing the tower, use of a safety line is required*
- *Drain the oil in the gear case and fill with proper oil according to the manufacturer's recommendations. Oil the turntable and the furl ring once a year.*
- *To service the pump, seals and piston, they must be removed from the column or drop pipe*
- *Check and adjust the furling mechanism tension to a lighter setting initially when installed. It can be tensioned when it runs and furls effectively.*
- *Check, tighten, and lubricate the moving parts according to the manufacturer's recommendations*
- *Replace worn bearings, rotor blades and other parts as necessary*
- *Inspect the wind pump annually at welded and bolted joints for cracks. Retighten or weld cracks.*
- *Paint the wind pump periodically to prevent corrosion.*

Pump jack

- *Follow safety procedures and manufacturer's recommendations related to servicing of the pump jacks to reduce the chance of fall, overhead, and being struck-by hazards during maintenance and servicing or removal to access the wellhead*
- *Check to ensure that the pump jack head is tightened, locked and/or latched securely in place with jack screws and clamp bolt.*
- *Change the oil in the pump jack gear box according to the manufacturer's recommendations*
- *Service the foot valve, leather and plunger as necessary*

Photovoltaic (PV) powered pumping systems

- *Check the manufacturer's recommended maintenance procedures for all batteries. Check the electrolyte level and specific gravity of each cell in the battery.*
- *Trees, shrubs and other vegetation may be trimmed to keep the PV array clear of shading. Clean the dust and debris off the solar panels with water as recommended by the manufacturer.*
- *PV-powered pumping systems require periodic replacement of filters, diaphragms, piston seals, cylinder leathers, or DC motor brushes depending on the type of pump.*

