

## NATURAL RESOURCES CONSERVATION SERVICE

## PRACTICE DOCUMENTATION MANUAL

## WATER WELL

642

**642 – STEP 1. INITIAL EVALUATIONS****SCOPE**

The purpose of this step is to determine the landowners desire to provide water for livestock, wildlife, irrigation and human uses in New Mexico. (See Natural Resources Conservation Service, practice standard 642).

**642 – STEP 2. INVESTIGATIONS AND SURVEYS****SCOPE**

The purpose of this step is to identify and carry out all the mandatory preliminary operations that are required before a water well can be sited and drilled. This will include obtaining all utility clearances, archeological clearances, obtaining the proper USGS 7.5 minute quadrangle sheet, surface geology map, the appropriate New Mexico Office of the State Engineer well permit, and a professional geology report that details the approximate depth to water, maximum drilling depth allowed, geologic materials expected to be encountered, and the potential water yield and quality. (see New Mexico Office of the State Engineer well permit forms and call 1-800-321-alert for utility clearance, also see Natural Resources Conservation Service, conservation practice job sheet 642b and associated worksheets).

**642 – STEP 3. WATER WELL DESIGN****I. SCOPE**

The work shall consist of drilling, casing, and developing a well at the location shown on the attached map. (See Natural Resources Conservation Service, practice standard 642, practice specification 642, job sheet 642, and applicable work sheets).

**II. ALIGNMENT**

Drilled wells shall be round, plumb, and aligned so as to permit satisfactory installation and operation of a pump of the proposed size and type to the greatest anticipated depth of setting.

**III. CASING INSTALLATION**

In consolidated formations, the casing shall extend from at least one foot above the ground surface through the overburden material to an elevation at least 2 feet into consolidated foundation.

In unconsolidated formations, the casing shall extend from at least one foot above the ground level to the screen.

For artesian aquifers, the casing shall be sealed into the overlaying impermeable formations so as to retain the artesian pressure.

If a water-bearing formation containing water of poor quality is penetrated, the formation shall be sealed off to prevent infiltration of poor quality water into the well and the developed aquifer.

The depth of the aquifer below the ground surface and the thickness of the aquifer to be penetrated by the well will govern the position of the screen in the wall. Where practical, the top elevation of the screen should be below the lowest water level expected during pumping and be located opposite the most permeable areas in water-bearing strata.

The screen openings for aquifer material of near uniform size shall be slightly smaller than the average diameter of the aquifer material. In wells using a gravel packed envelope, the screen shall have openings of a size that will exclude at least 85 percent of the gravel pack material. The length and open area of the screen shall be sufficient to maintain the entrance velocity of water into the well at an acceptable level.

#### IV. DEVELOPING

The well shall be developed until it has stopped producing detrimental quantities of solid particles.

#### V. PROTECTION

All wells shall be cased to a sufficient height above the ground surface to prevent the entry of surface and near surface water. A sanitary well seal shall be installed at the top of the well casing to prevent the entrance of contaminated water or other objectionable material. The casing shall be surrounded at the ground surface by a 4-inch thick concrete slab extending at least 2 feet in all directions.

#### VI. GRAVEL PACK

If gravel packing is used, it shall be of the specified gradation and thickness and shall be carefully placed to prevent segregation and bridging. Gravel pack materials shall extend a minimum of 2 feet above the top of the perforated or screened section and shall extend through the length of the water-bearing formation.

#### VII. MATERIALS

The well casing pipe, couplings, and screens shall be homogeneous throughout and shall be free from visible cracks, holes, foreign materials, or other injurious defects. The well casing pipe, couplings, and screens shall be as uniform in color, density, and other physical properties as is commercially possible.

##### Casing

Casing materials may be pipe made of steel, copper, plastic, fiberglass, concrete, or other similar materials of equivalent strength and durability.

The specific material requirements for the casing and other site requirements are as listed on the Natural Resources Conservation Service practice specification 642.

#### VIII. JOINTS

Joints for well casing shall have adequate strength to carry the load due to the casing

length and still be watertight or shall be mechanically supported during the installation process to maintain joint integrity. Such mechanically supported casings shall terminate on firm material that can adequately support the casing.

Joints for plastic well casing pipe may be solvent cement or threaded coupling and shall have sufficient strength to carry the load due to the casing length and still remain watertight. Solvent cement must meet the requirements of the ASTM specification appropriate for the material used.

### 642 – STEP 4. CONSTRUCTION PLANS AND SPECIFICATIONS

#### I. SCOPE

The purpose of this step is to document and describe the methods and materials used during the construction and installation of the water well. This will include the documentation of the drilling equipment, drilling technique, bore size, filter design and installation, location of seals, and the screen design and dimension of the openings. This information is to be included on the livestock well data sheet (nm-eng-163). Other reference material should include the NRCS conservation practice specification 642, job sheet 642b and associated work sheets.

### 642 - STEP 5. MANAGEMENT AND OPERATION, MAINTENANCE

#### I. SCOPE

The purpose of this step is to assure the proper management and maintenance is completed at the well site. (See Natural Resources Conservation Service, practice standard 642, practice specification 642, job sheet 642 and associated job sheets).

#### II. CONSTRUCTION OPERATIONS

Construction operations shall be done in such a manner that erosion and air and water pollution are minimized and held within acceptable limits. The owner, operator, contractor or other persons will conduct all work and operations in accordance with proper safety codes for the type of construction being performed with due regard to the safety of all persons and property.

The completed job shall be workmanlike and present a good appearance.

### **III. OPERATION AND MAINTENANCE ITEMS**

A properly operated and maintained well is an asset to your farm or ranch. This well was designed and installed to provide water utilization. The life of this system can be assured and usually increased by developing and carrying out a good operation and maintenance program that will contain the following at a minimum.

Maintain the well cover securely in place.

Protect the area from being damaged by agriculture machinery, vehicles, or livestock.

Do not allow any foreign debris to accumulate in the immediate vicinity.

Eradicate or otherwise remove all rodents or burrowing animals. Immediately repair any damage caused by their activity.

Check metal surfaces for rust and other damage especially sections in contact with earthfill and with other materials. Repair or replace damaged sections and apply paint as a protective covering.

Keep all surface water from entering or accumulating at the immediate vicinity of the well site.

Immediately repair any vandalism, vehicular, or livestock damage to any earthfills, spillways, or outlets of other apparatuses.

### **642 – STEP 6. COMPLIANCE OR SPOT CHECKING**

#### **I. SCOPE**

The purpose of this step is to determine that all work has been completed to the standards required by the Natural Resources Conservation Service. (See Natural Resources Conservation Service practice standard 642, practice specification 642, and job sheet practice 642, and associated job sheets).

#### **II. DOCUMENTS**

Copies of all completed job sheets and associated work sheets should be submitted to the Natural Resources Conservation Service representative within 10 working days of completion of the well.