

- 9. Wells.** The Introduction (Chapter 1) for these design data collection guidelines contains additional information concerning: preparing a design data collection request, design data collection requirements, and coordinating the design data collection and submittal.

The design of wells for water supply, drainage, and other similar purposes requires extensive subsurface and other data. Because of the nature of the environment of ground water, maximum reliance for correct interpretation and use of the data must be based on the competence, experience, and judgment of the ground water engineer or geologist.

The following is a minimum checklist of data necessary for feasibility design and cost estimates for wells and well fields.

**A. Maps:**

- (1) A general location map showing locations of the well site(s) and communities, transportation facilities, and other cultural features.
- (2) A construction site map showing locations of the well(s), right-of-way, access roads, and sources of power and water for construction purposes.
- (3) A geologic map showing surface geology, topography, subsurface data points such as existing wells, and other similar data.

**B. General Conditions:**

- (1) Location of, ownership of, and accessibility to the site.
- (2) Location and included area if a well field.
- (3) Stratigraphic and structural conditions including general types and sequences of materials.
- (4) Drilling conditions - ease of drilling, stability, etc.
- (5) Standards, permitting requirements, etc.
- (6) Other wells in the immediate area (oil, gas, etc.).
- (7) Location and type of power sources, utility easements, buried cables, pipelines, etc.

**C. Aquifer Conditions:**

- (1) Depth.
- (2) Thickness.
- (3) Type and stability of material.

- (4) Size and range if material is granular.
- (5) Transmissivity and storativity.
- (6) Water budget.
- (7) Aquifer storage capacity and amount of water storage.
- (8) Depth and thickness of confining unit(s).
- (9) Contour maps (bedrock surface, top of aquifer(s), etc.).
- (10) Natural recharge and discharge locations and amounts.
- (11) Sustained yield potential.

**D. Ground Water Conditions:**

- (1) Static water level.
- (2) Water level trends.
- (3) Known locations and types of potential or existing pollution source(s) – either natural or anthropomorphic.
- (4) Locations, amounts, and usage of existing and planned future withdrawals.
- (5) Radius of influence and drawdown map.
- (6) Quality of water to include the concentration of major ions and all parameters having primary and secondary maximum contaminant levels as defined by the Safe Drinking Water Act.

**E. Well Conditions:**

- (1) Design yield. The foregoing factors must be considered in light of ground water reservoir conditions – areal distribution, recharge, yield, and pumping conditions, including pump costs, power availability and cost, etc.

**F. Environmental Considerations.** Impacts to environmental resources, especially the:

- (1) Location, size and type of wetlands that could be influenced by the drawdown core or by discharge from the well.
- (2) Impact of drilling and testing operations.
- (3) State standards.

- (4) Presence of completed facility.
- (5) Permitting requirements.
- G. **Safety Factors.** Material outlining safety factors, including presence of high subsurface pressures or toxic gasses.
- H. **Report.** The foregoing data should be included in a report, together with a brief, descriptive summary of the geology of the area, existing ground water conditions, and ground water development to date.
- I. **Electrical Data:**
  - (1) Location of point where connection to power supply will be made.
  - (2) Names, telephone numbers, Web sites, email addresses of electrical power suppliers, and contacts within those organizations.
  - (3) System voltage at which power will be supplied, number of phases, and whether service will be overhead or underground.