

## SHALLOW GROUND WATER MONITORING

**PURPOSE:** The shallow groundwater monitoring program shall be designed to evaluate ambient water quality as well as potential nitrogen (nitrate, nitrite etc.) related impacts to groundwater quality over time attributable to the waste discharge to land. The groundwater monitoring wells shall be designed to yield samples representative of the uppermost, most permeable portion of the aquifer underlying the land application and storage areas.

**MONITORING CRITERIA:** The following standards and criteria should be considered in the design of a shallow groundwater monitoring program:

1. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells (hereafter DWR Well Standards), as described in California Well Standards Bulletin 74-90 (June 1991) and Water Well Standards: State of California Bulletin 94-81 (December 1981). These standards, and any more stringent standards adopted by the state or county pursuant to Water Code section 13801, apply to all monitoring wells used to monitor the impacts of wastewater storage or disposal.
2. Monitoring wells should generally be screened across zones of the highest hydraulic conductivity within the Shallow Zone.
3. Monitoring well Screen interval:
  - a. Well should be screened across the water table of the Shallow Groundwater Zone.
  - b. Screens should generally extend from about 5 feet above the water table to approximately 15 feet below the water table but should be designed based on site-specific conditions, such as unconfined, semi-confined or confined conditions, anticipated water level changes over time, etc.
4. Monitoring well network design:
  - a. A sufficient number of monitoring wells shall be strategically placed to determine groundwater gradients and to estimate the ambient water quality and associated assimilative capacity for **nitrate and TDS**
  - b. A sufficient number of monitoring wells shall be strategically placed to define the lateral and vertical extent of elevated concentrations of nitrate and/or TDS in groundwater
  - c. If existing wells are going to be used for monitoring, the discharger must demonstrate that the wells are properly designed, properly sealed, properly screened and properly located to evaluate the impact on shallow groundwater.
5. When evaluating the depth to shallow groundwater, a number of local impacts should be considered:
  - a. If a major agricultural irrigation well or municipal well is actively pumping in an area the groundwater surface may be significantly depressed and groundwater flow direction may change seasonally.
  - b. Older supply wells may not have a competent well seal or at the top of the well screen.
  - c. Seasonal variations and drought conditions should be considered.
  - d. Area of highest hydraulic conductivity.
6. Special consideration should be given when placing wells into fractured bedrock aquifers with regards to the appropriateness of monitoring wells and whether the associated data obtained would be representative of overall groundwater conditions in the area.