Overview of Site Selection, Site Evaluation, Well Design, and Permitting for New Drinking Water Wells

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Luhdorff & Scalmanini Consulting Engineers (LSCE)

Services

- Groundwater Resources
- Wells and Pump Stations
- Treatment, Storage and Distribution
- Environmental
- Groundwater Modeling
- Data Management Systems

Overview of Site Selection, Site Evaluation, Well Design, and Permitting for New Drinking Water Wells

- Identification and evaluation of a potential new well site
- Collection of the information required to design a new well
- Well design considerations
- Regulatory requirements and permitting

New Well Project Approach

Think the entire project through before starting anything!

- Anticipate every potential issue
- Address/resolve each issue as soon as possible
- Every project is different
- Utilize experienced consultants and contractors

Initial Site Selection and Evaluation

Well Siting

- Identify where source is needed – area, pressure zone
- Identify available sites – owned sites, easements, available for purchase

Initial Site Selection and Evaluation

Well Siting

- Site size – large enough for well station components, operations and maintenance
- Ability to meet setback requirements- Sanitary features, control zone
- Proximity to utilities – distribution, electrical, storm and sanitary sewers
- Sources of potential groundwater contamination
- Special situations – airports, railroads, schools
- Physial hazards

Initial Site Selection and Evaluation

Well Siting - Constructability

- Site size
- Site access
- Equipment layout
- Land use – site and vicinity
- Seasonal ground conditions
- Hazards
- Water supply for drilling
- Fluids disposal
- Cuttings storage and disposal
- Neighbors
- Need for sound attenuation
- Safety/security

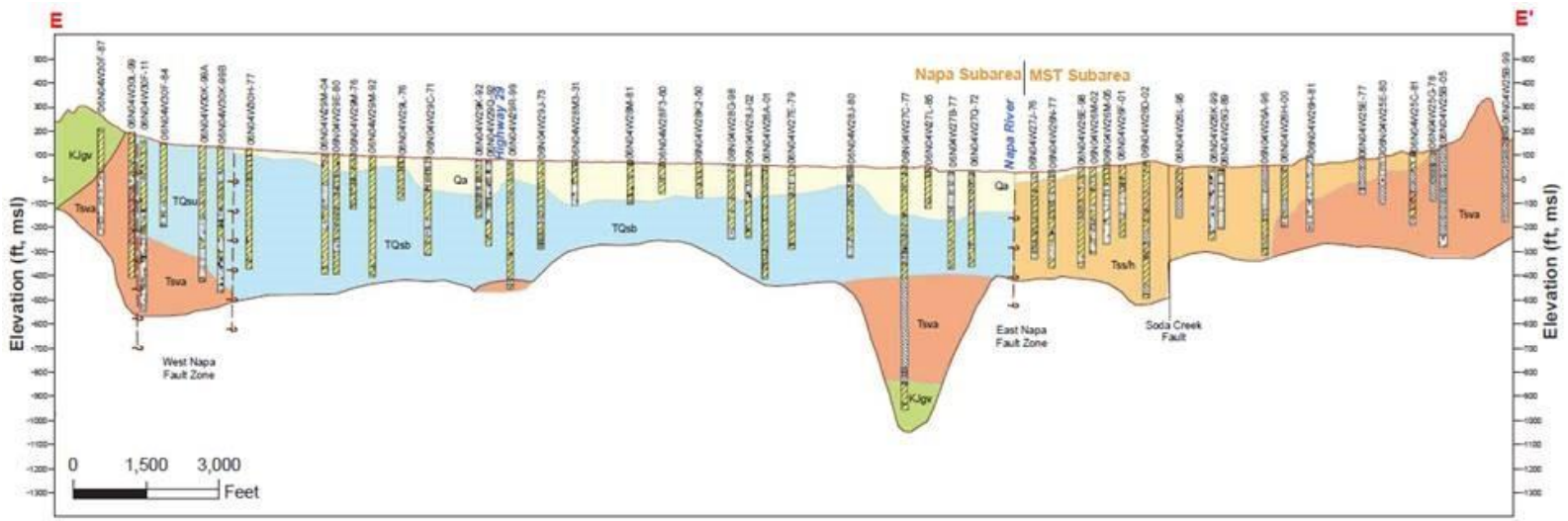
Hydrogeologic Investigation

Hydrogeologic review of area

- Geology
- Groundwater conditions
  - Seasonal and long-term water level variations
  - Water quality

Review of existing wells

- Well construction
- Yield
- Specific capacity
- Water quality



Sources of Data and Information

- Previous projects, existing records
- California Department of Water Resources (DWR)
- SWRCB – GeoTracker
- SWRCB – Groundwater Ambient Monitoring and Assessment Program (GAMA)
- DWR
- United States Geological Survey (USGS)
- City/County – Environmental Health, Public Works, Water Department
- Drillers, pump contractors

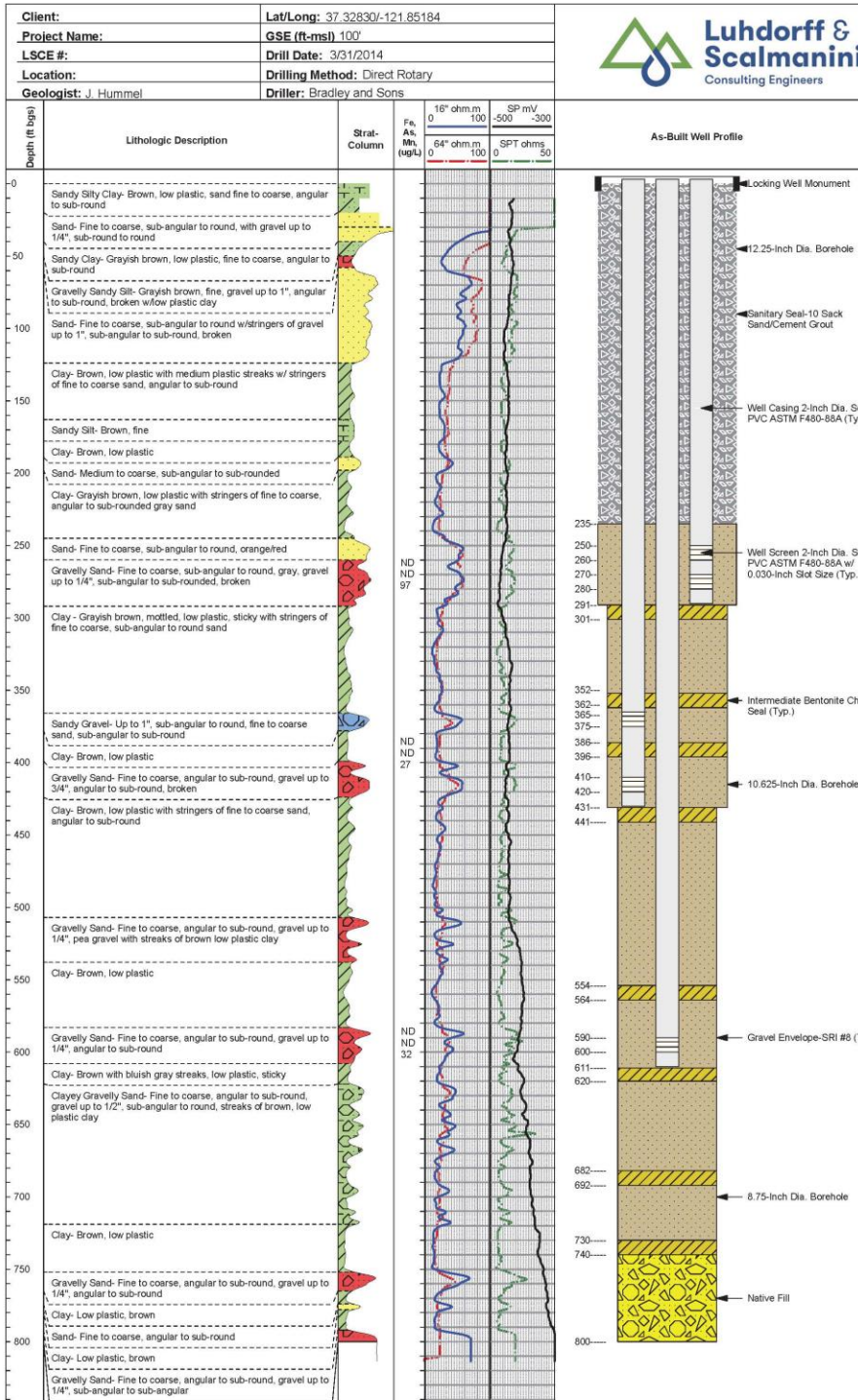
Site Specific Investigation

Purpose of site-specific investigation

- To determine if a well can be constructed at a site that will yield water in sufficient quantity and at a quality as to be economically viable
- To collect the data and information needed to design an efficient and sand free well.

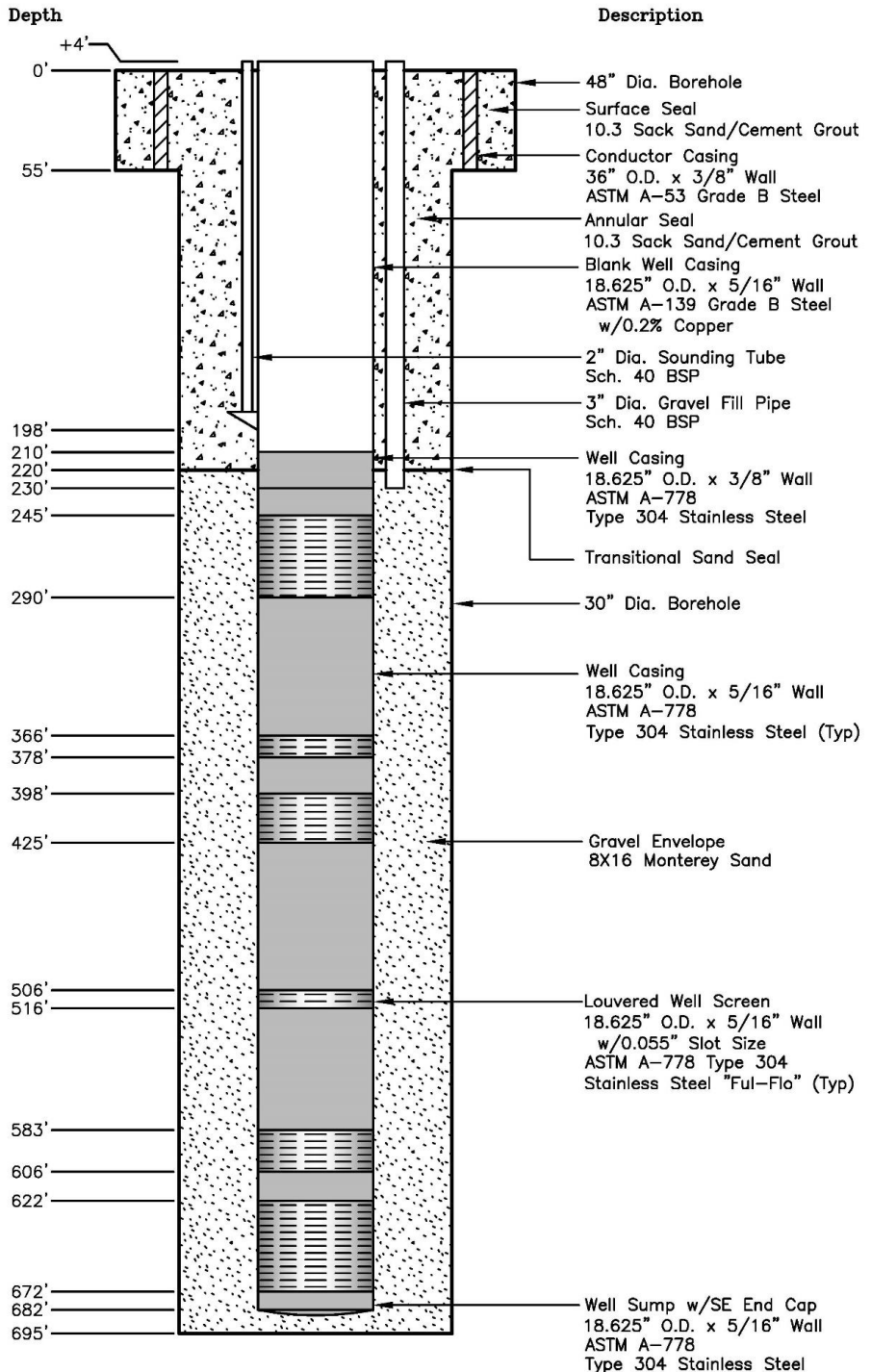
Test Hole-
Monitoring Well

- Small diameter test hole
- Sample collection
- Geophysical surveys
- Installation of multiple piezometers
- Sieve analysis
- Collection/analysis of water samples
- Long-term water level monitoring
- Ability to retest water quality



Well Design Considerations

- Seal Depth(s)
- Casing Diameter
- Casing thickness
- Casing Material
- Screen Type
- Gravel Pack Gradation
- Screen Slot Size
- Inlet Velocity
- Accessory Pipes
- Well Head Completion



CEQA

California Environmental Quality Act (CEQA)

Purposes:

- Prevent significant, avoidable damage to the environment
- Foster informed public decision making
- Ensure transparency in governmental decision-making process
- Encourage public participation

Production Well Permitting

Drinking Water Source Assessment and Protection (DWSAP)

- Survey to identify potential sources of groundwater contamination

DDW Siting Concurrence

- DSWAP
- Well design
- Well location
- Site layout – setbacks from sanitary features, control zone
- Investigation report
- Water quality
- Flood hazards

Production Well Permitting

Required permits for typical well installation

- Siting Approval – City, County
- Drilling – County, City, Water District
- Water supply – Purveyor
- Encroachment – City, County
- Construction Permits – City, County
- Discharge Permits - Sanitary Sewer (Sanitation District)
  - Storm Water System (Owner)
- Special – RR, FAA, special facilities

- Neighborhood Outreach

Production Well Construction Specifications

- Do not make Contractor responsible for planning and permitting.

- Incorporate permit requirements into project specifications:
  - Practices, limitations, site specific requirements
  - Required notifications
  - Monitoring, data collection
  - Reporting

- Clearly define who (contractor, consultant, owner) is responsible for permitting elements (notifications, reporting, fees)

Wrap Up

Every project will present a different set of challenges.

A successful project depends on identifying and developing the information required at each phase of project that will be needed in successive phases:

- Well site evaluation and investigation
- Collecting of information to design a new well and size pump
- Project planning and permitting
- Incorporating permit requirements into project specifications
- Complying with permit requirements

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