EXECUTIVE SUMMARY (Bozorginia, M)

Prepared for

IRVINE RANCH WATER DISTRICT

BY

ENGINEERED WELL

UC IRVINE

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This Final Design Report (FDR) provides a comprehensive analysis of the design of a water supply well for Project Area 6 (PA6) in Irvine, Ca. The well is planned to be drilled 1,200 ft below ground surface, and is expected to produce 3,500 gallons per minute (gpm) based on information from other wells in the vicinity. It will provide a redundant source of potable water and fire flow supply to Planning Area 6, which has a connection to only one imported water supply pipe. The well will be located in the Orange County Groundwater Basin (Basin) that provides approximately 75% of the demands of the agencies overlying the basin.

The project has two phases. During Phase 1, the well will be drilled, cased, developed, tested, and disinfected. Engineered Well will make a preliminary pump selection and develop a
pumping facility layout during this phase. Phase 2 will involve equipping of the well with the pump and appurtenances based on the information developed during Phase 1. It will also include the design and construction of the well house.

The Phase 1 project will be bid in May 2009, and completed in January 2010. The estimated cost to drill and complete the well casing is $1,356,450. Design of the Phase 2 improvements will be completed in February 2011. Phase 2 construction is expected to cover a period of 9 months and will cost roughly $2,749,500. The overall cost of the project (Phase 1 plus Phase 2) will be $4,105,950.

Because the well site is adjacent to an existing residential area, sound attenuation to meet the City of Irvine Noise Ordinance requirements is very important. The Phase 1 project specifications will include these requirements.

A Pilot Hole will be drilled first to a depth of 1,200 feet to make sure that the selected site is suitable. The pilot hole will be 17 ½ inches in diameter. Results of the sieve analyses of the formation materials, geophysical logging of the pilot hole, discrete zone testing within the pilot hole, and water quality testing will provide the information needed for the final design of Phase 1. The pilot hole will then be reamed for the installation of the well casing, gravel pack, and the sanitary seal. The casing is planned to be 20” inside diameter stainless steel with ful-flo louvered screens. Gravel pack between the soil and well casing will screen the soil formation, and the louvers will be sized to screen the gravel pack so that a minimum amount of soil will enter the well when it is completed.
The well will contain a deep well turbine pump, which will be placed above the louvered screens to make sure that water is drawn into the pump evenly, and not through a short section near the pump inlet. It will pump in a closed system that is not regulated by a reservoir. Water lubricated Byron Jackson Vertical Turbine Pump with grade 416 stainless steel shaft and trimmed bronze impellers have been selected for this project. The pump will be driven by a 500 HP above ground inverter duty, premium efficiency motor. Engineered Well has arranged this design report to portray all the detail in specifications and plans of a water supply well. It is Engineered Well’s mission to produce the best possible product to serve the community and satisfy the client.