

Using Multi-Parameter TROLL Data Loggers to Monitor Seawater Intrusion during Pumping

Eric Strahan, Regional Sales Manager

As part of a conjunctive use water management project in the Dominican Republic, Montgomery Watson Harza (MWH) of Pasadena, California, is assisting Corporacion del Acueducto y Alcantarillado de Santo Domingo (Sewer and Water Corporation of Santo Domingo, CAASD) with preliminary testing, well field and pipeline design and construction at the proposed Los Marenos well field.

With current population exceeding 3 million people, Santo Domingo is the largest city in the Dominican Republic. The city's water supply comes from a combination of surface water and groundwater sources. Increasing population and demand for suitable drinking water has led to an increase in the rate of

groundwater extraction. Santo Domingo is located on the south coastal plain of the Dominican Republic, so the groundwater resource must be managed to minimize the adverse impacts of seawater intrusion. MWH, under contract to CAASD, is providing engineering consulting services to efficiently increase groundwater extraction while minimizing seawater intrusion.

"Salinity in the well increased at pumping rates above 900 gpm. The data from our TROLL 8000 let us know when to stop pumping."—Chris Petersen, MWH

MWH is performing aquifer testing using new and existing extraction and observation wells. Chris Petersen, a Supervising Hydrogeologist with MWH, is using a pair of In-Situ's Multi-Parameter TROLL 8000 water-quality probes to continuously monitor changes in groundwater level and salinity during



Well #4 in the Los Marenos well field. This is one of the wells being impacted by high salinity, so the pumping rate has been reduced. Capacity = 1800 gpm, Current pumping rate = 1350 gpm, depth = 53 m, screened from 10-53 m - slotted pipe screen.



Well #7 in the Los Marenos well field. One of the MP TROLL 8000s is mounted in a nearby well with an identical surface completion.



This photo was taken during a pumping test on a new well installed near the freshwater/seawater interface. The test ran for 5 days, during which the pumping rate was gradually increased from 300 gpm to 1200 gpm. Salinity in the well increased at pumping rates above 900 gpm. An MP TROLL 8000 is monitoring water level and salinity in an observation well 14 m southeast of this pumping well.

pumping of extraction wells located near the freshwater/seawater interface. The zone being monitored is 30-40 meters below ground surface. Salinity is measured with the instrument's conductivity sensor. The TROLL 8000 can measure and record pH, dissolved oxygen, and temperature in-situ, as well as water level and conductivity. The recorded data was downloaded daily during pumping and used by the engineers to optimize pumping rates.

MWH is also evaluating impacts of pumping on seawater intrusion at two other existing well fields and providing recommendations on how to modify existing well fields to minimize seawater intrusion.



This ditch carries discharge water from the well shown in the photo above to a river located 1 mile to the north. The ditch was necessary so that discharge water would not flood the ag fields.

Acknowledgment: Information and illustrations for this Application Note were generously supplied by Christian E. Petersen, RG, CHG, Supervising Hydrogeologist with Montgomery Watson Harza, Pasadena, CA.

1 800 4INSITU

(toll-free, US and Canada) or 307 742 8213 www.in-situ.com

