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July 9, 2007

Mr. Steve Krupa
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33406

Dear Steve:

Enclosed are three copies of our letter report documenting the geophysical logging of eight (8) wells located in Martin and Palm Beach Counties, Florida. Electronic copies of the log plots are also being provided as PDF files. Digital data for the logs in each well are being provided as Excel files. I have enclosed our invoice for this work.

It was a pleasure working with you on this project. If you have any questions about the logging or need further assistance, please don't hesitate to call.

Sincerely,



Lynn Yuhr, P.G.
President

**Report
Geophysical Induction Logging
Of Eight Saltwater Monitoring Wells
In Martin and Palm Beach Counties, Florida**

**for
South Florida Water Management District
West Palm Beach, Florida**

July 9, 2007

SFWMD Purchase Order No.: 4100000026

Technos Project No. 07-174

BACKGROUND AND APPROACH

South Florida Water Management District contracted Technos, Inc. to conduct geophysical induction logging of as many as ten saltwater monitoring wells located in Martin and Palm Beach Counties. The purpose of the logging was to provide data that can be used to aid in the interpretation of saltwater intrusion. No interpretation of the logs were included in this effort. The wells logged included:

- Lantana – LT1-N and LT4-C;
- Lake Worth – LWMW-2 and LWMW-4;
- Stuart – M1011 and M1147; and
- Jensen – S1B and S4C.

Fieldwork was carried out on July 2nd and 3rd, 2007.

GEOPHYSICAL INDUCTION LOGGING

Electrical conductivity measurements were made using an induction probe that measures conductivities to a radius of about 2.5 feet from the probe. This log provides continuous data through a PVC-cased or open borehole both above and below the water table. Above the water table, the log responds to soil and rock conductivities plus the degree of moisture present and the specific conductance of the moisture. Below

the water table, the log responds to soil and rock conductivity plus the saturated pore fluids. The specific conductance of the pore fluid will often have the dominant effect on the measurement. Data acquire within steel casing is not valid and are not used for interpretation.

The induction logs were digitally recorded as the probe moved both down and up the boreholes at approximately 13 feet per minute. The induction log measures conductivity in units of milliSiemens per meter (mS/m). Resistivity (ohm-m) is calculated from this measurement and included in the data file. The data were plotted using WellCAD.

RESULTS

A plot of the geophysical log for each well has been created using WellCAD. The geophysical logs have been plotted using a depth scale of 1 inch = 20 feet with the exception of one well that was much deeper than the rest (LWMW-4). Electronic versions of these plots have been provided with this report as PDF files. Digitally logging data has been provided as Excel files showing depth, induction conductivity and induction resistivity values. In addition, maps for each well were developed.

All wells were cased with PVC except one, LT4-C in Lantana which was cased with steel and had an open hole interval from about 140 to 154 feet.

The geophysical log plots have used consistent scales for each of the log types so the data from one well can easily be compared to data from another well. When measured values for a log exceed the scale, the data wraps itself around the log scale. For example, the induction conductivity log is plotted using a scale of 0 to 100 mS/m. When the measured values exceed 100 mS/m, which occurs in four wells, the data will wrap around and continue plotting.

In 1996, Technos completed a project in Broward County correlating induction conductivity values to chloride values¹ resulting in a linear regression of $y = 20.526x - 464.62$. This correlation shows that a conductivity value of about 35 mS/m indicates a chloride value of about 250 mg/l and a conductivity values of about 71 mS/m indicates a chloride value of about 1,000 mg/l. While this relationship was based upon data specifically acquired in Broward County, it should generally be applicable to other areas with similar geologic conditions.

1 - Technos, Inc. 1996. Broward County Saltwater Intrusion Monitoring Program Final Report: Task 1-100 TDEM Soundings and Task 2-Quantitative Relationship Between Time Domain Electromagnetic Measurements and Water Quality Data