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Shaw™ Shaw Environmental, Inc.

July 22, 2004

Mr. Subhash Pal
Project Manager
Superfund Cleanup Section
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg. D
Austin, Texas 78753

Re: Remedial Investigation – Data Logger Assessment to Support Planning for Water Level Measurement Collection at Jones Road Superfund Site, Northwest Harris County (near Houston), Texas

Dear Mr. Pal:

Shaw Environmental, Inc. (Shaw) is pleased to present to the Texas Commission on Environmental Quality (TCEQ) this letter report which summarizes the results of the Remedial Investigation (RI) – Data Logger Assessment to Support Planning for Water Level Measurement Collection. This letter report is not intended to be a final report nor does it preclude or serve in the place of the Remedial Investigation Technical Memorandum; rather, this letter report provides supplemental information to be used as part of the RI.

TCEQ requested that Shaw assess and evaluate the viability of using data loggers which monitor and digitally tabulate fluctuations in groundwater levels in wells. Previously, Shaw had proposed the monitoring of groundwater level fluctuations in currently existing wells in order to obtain hydrological information at the site. The water level data that is collected will then be used to help define the hydraulic gradient (direction of flow) of the groundwater, assess the impact of the pumping by private wells in the area on the gradient, and provide hydrologic information which can be used in the modeling of the hydrologic conditions to support the design of a remediation (pumping) well system as warranted.

Background Information

TCEQ and Shaw through previous efforts have identified a number of water wells (i.e., active and/or inactive) for inspection to assess their use as groundwater level measurement stations. The well inspections were conducted on June 15, 2004, jointly by representatives from Shaw, Wellco Drilling & Service Company (Wellco), and TCEQ; the results of the well inspection were documented in a letter report prepared by Shaw, dated June 30, 2004. Eight private water wells have been

subsequently selected through joint discussions between technical representatives of TCEQ and Shaw. The wells (identified by address/owner) selected for the purpose of monitoring/recording groundwater fluctuation data are:

Address	Owner/Resident
10622B Jones Road	Mauk
11619B Advance	Ballew
11350 Jones Road West	OMEGA
11025 Forest Valley	Olle
11634* Oak Valley	Daub
11103B Timber Crest	Williams
11222 Timber Crest	EPV Drywall
11010A Jones Road	Mulligan's (drinking water well)

* This address was previously identified erroneously as 11642 Oak Valley.

In addition to the wells identified above, Shaw is recommending the monitoring of at least one of the nine Monitoring Wells (MW- 1 through 9) to compare water level fluctuations within the 30-foot WBU with the Chicot Aquifer represented in the private wells to assess their collective response to precipitation events.

Use of digital data logging water level measurement devices at the Jones Road Groundwater Plume Superfund site has been proposed. Specific objectives or features that this equipment must have/provide include the following:

self-contained/internal data logging capabilities (i.e., minimal apparatus on or above well head);

accommodate installation within a 1 inch O.D. drop tube (< 22mm);

intrinsic power supply to support continuous operation for at least 30 consecutive 24-hour days;

sufficient memory capacity for data collection/storage of at least 720 records (hourly for 30 days);

accommodate easy data retrieval for subsequent ultimate presentation in hydrograph tables;

availability through rental over 1-2 month duration.

Digital Data Logger Systems

There are a number of digital data logger systems commercially available which can be used for monitoring groundwater fluctuations in water levels. For the purposes of comparing features of data

loggers that approximately meet a combination of the TCEQ's objectives identified above, the following data logger systems were evaluated in this assessment:

Unit/Model Name	Manufacturer/Distributor
WL15X Water Level Logger	Global Water, Inc.
Minilog TDR Temperature & Depth Recorder	Geo Scientific Ltd.
8007 WDP Water Depth & Temperature Recorder	Geo Scientific Ltd.
miniTroll Standard (Pressure)	In-Situ Inc.
Nomad OM-CP-Level1000 Water Level and Temperature Datalogger	Omega
Ecotone Water Level Logger	Intermountain Environmental, Inc.

Comparison of the features of the data logger units is summarized in Table 1. Individual specifications for each of these units from which these comparisons were based are provided as an attachment to this document.

In general, these systems are very similar in that they all measure water level fluctuations and digitally record these measurements against an internal time clock. All of the units provide flexibility in their programming so the operator can modify the frequency/schedule that the measurements are collected. All of the units evaluated have sufficient memory capacity and intrinsic power supplies for the duration specified.

All of the data logger systems utilize a pressure transducer as the measuring device to monitor water level changes (i.e., changes in pressure are converted into feet of submergence; some systems also allow for the entry of datums, for example if desired, changes in the water levels can be recorded in elevations above mean sea level real-time). For accuracy, all of the systems selected for evaluation can be calibrated to make adjustments in the readings to account for barometric pressure fluctuations; systems without this feature were not evaluated.

All of the systems evaluated allow for the recorded data to be transferred to a Windows based PC laptop computer through either a USB or RS-232 port or both. The systems with most user friendly data transfer systems provide Windows based software which also allow the use of Personal Data Assistant (PDA) devices to control the system, monitor readings in real-time, or download data. PDA's are generally less bulky in the field than their laptop counterparts and offer additional flexibility.

The most discriminating features found among the systems were the size of the transducers, the 'self-contained' nature of system minimizing the exposure of components at the well head and the system's availability for rental.

While many of these units have their specific advantages and benefits (depending upon the application), the miniTroll (by In-Situ) system fulfills all of the TCEQ specified features required in the application at the Jones Road Superfund site.

Cost Evaluation - miniTroll Data Logger System at Jones Road

Bid quotations for the miniTroll Data Loggers systems were requested from Intermountain Environmental, Inc. who is licensed by In-Situ (the manufacturer) and also directly from In-Situ Rentals for the explicit purpose of comparing costs of rental versus purchase costs. For the purposes of requesting quotations, the following specifications were provided:

Quantity of 9 miniTroll Standard Pressure (30 psi) - 200 foot of cable each

Quantity of 1 miniTroll Standard Pressure (30 or 15 psi) -50 foot of cable each

Quantity of 1 PocketPC with cables for programming

Quantity of 1 set of computer cables for downloading data to Laptop computer

Assume for rental 1 month between the period of Aug. 15 through Oct. 15

Shipping location - Houston, Texas 77077

The use of an extra 30 psi miniTroll with 200 foot cable (9 instead of 8) was applied to ensure the availability of a back up unit in case of failure of another and to provide a means to "spot" monitor the systems installed in the wells for quality purposes. In addition, access to an extra system also provides the flexibility to temporarily monitor other wells for short durations during the monitoring period if desired.

Price quotations[1] for rental and purchase are attached. Rental costs of systems for one month ranged from $6,130.80 to $7,112. Purchase price for the same equipment ranged from $16,344.45 to $18,452.50. The breakeven point between purchase and rental is approximately 2.65 months (50th day). Please note that 'rent to purchase' transactions require an additional payment of 10 to 15% on top of the straight outright purchase price with rental credit applied.

A summary of the expected level of effort (Shaw's) for installation and operation of the data logger systems over a 30 day period and presentation of tabularized data and hydrographs for each well has been provided below.

Task Pre-Field Installation Planning/System Design Activities

Project Manager	8 Hrs
Senior Scientist	12 Hrs
Mid-Level Scientist	8 Hrs
Field Technician	10 Hrs

Task Installation/Removal of Transducers/Data Loggers (8 deep and 1 shallow well)

Project Manager	3 Hrs
Senior Scientist	8 Hrs
Mid-Level Scientist	22 Hrs
Field Technician	22 Hrs

[1] Note: Costs quotations do not include Shaw's G&A expenses or fees. Rental periods begin the day after shipped (delivery date to customer) and ends the date equipment is returned.

Task In-Progress System Monitoring (30 days)

Project Manager	2 Hrs
Senior Scientist	8 Hrs
Mid-Level Scientist	8 Hrs
Field Technician	20 Hrs

Task Post-Field Work Activities (return equipment, data transfer/formatting)

Project Manager	2 Hrs
Senior Scientist	2 Hrs
Mid-Level Scientist	10 Hrs
Field Technician	3 Hrs

The level of effort for the installation of each system will vary depending upon each individual well application. Activities not included in the scope of the level of effort described below include the well work over (pump removal, installation of drop pipe, retrofitting or replacement of well cap to accommodate data access, downhole camera survey, logging), any survey necessary to establish elevation control of top of well casing to reference water levels to mean sea level, or the preparation of a written report documenting the results of the water level monitoring.

This concludes the summary letter report. A joint conference call to review the results of this assessment and to discuss future plans and strategies for monitoring water levels can be held at your convenience.

If you have any questions about this report, please feel free to contact me directly at 281-396-4590.

Sincerely,
Shaw Environmental, Inc.

Perry Mann
Program Manager

PM/mfa
Attachments

cc: Marilyn Long- TCEQ
Ben Shields-TCEQ
Shaw File copy