

## MEMORANDUM

**TO:** John Seifert, LBG-Guyton Associates  
**FROM:** Bob Harden, R.W. Harden & Associates  
**DATE:** July 27, 2015  
**SUBJECT:** Stakeholder Meeting Comments – LSGCD Strategic Planning Study

John, as I informed you on July 14<sup>th</sup>, I am unable to attend a stakeholder meeting scheduled for the last week of July. In lieu of attending the stakeholder meeting scheduled for July 29<sup>th</sup>, on behalf of the City of Conroe, I provide you the following comments and recommendations.

### Historical Groundwater Pumping

Most of the language in the technical memorandum describes pumpage by county rather than pumpage by aquifer (See Figures 2, 3, and 4, and Table 1). Because changes in artesian pressure and water table storage occur by aquifer and because counties do not actually produce groundwater, it is not as meaningful to report changes in pumpage by county. The technical memorandum identifies that a number of permittees in LSGCD report total pumping, but do not report pumping by aquifer, and that LSGCD is improving its database and reporting requirements to better address pumpage by aquifer in the future. *For now, we recommend that the report identify to the extent possible pumpage by aquifer in Montgomery County and surrounding counties.* The United States Geological Survey has expressed use by aquifer in the Houston Area Groundwater Model and GMA 14 is using estimates by aquifer, as well.

### Water Level Data

Water level data are presented by aquifer. The trends in these water levels can best be understood by knowing the magnitude, timing, and location of pumpage by aquifer.

## **Review of Monitoring Program Suggestions**

The technical memorandum identifies areas within Montgomery County where additional water level monitoring wells could be installed. The monitoring well location recommendations are identified by aquifer. Generally, the report identifies the opportunity to cease monitoring wells in areas with a high density of monitoring and increase the monitoring density in areas of the county with few to no monitoring wells. *Extending this idea further, we recommend developing a general grid spacing for monitor well locations in the artesian zone and perhaps a different grid spacing be developed for the water table areas. We also recommend that more emphasis be placed on monitoring of the water table (storage), as opposed to monitoring of artesian pressure. Because deeper artesian monitoring wells are more expensive than shallow water table monitoring wells, we recommend a higher proportion of the shallow wells be constructed first as opposed to the deeper artesian wells.* The initial installations could be more widely spaced with infilling at later dates, as budgets allow.

*We recommend the water table zone wells be as shallow as practical, with total depth perhaps as little as 20 feet below the existing water table. In our experience, care must be exercised when interpreting water level hydrographs in aquifers like the Gulf Coast, where confined artesian conditions can exist in deeper wells located in apparent water table zones at shallower depths.*

The technical memorandum focuses on the development of a monitoring well network only within the area of LSGCD, as opposed to the development of a monitoring program that is designed to measure the full range of effects of production located within LSGCD. *We recommend the report identify the full areal extents of the effect of production within LSGCD.*

## **Aquifer Response to Reductions in Groundwater Pumpage**

The technical memorandum identifies changes in water levels in response to reductions in withdrawals by North Harris County Regional Water Authority (NHCRWA). The changes are referenced as changes in “static water level” (ex. Figure 17). *We suggest indicating whether changes in static water level are changes*

Memorandum to: Mr. John Seifert

July 27, 2015

pg. 3

*in artesian pressure or changes in water table storage, rather than using the more generalized term “water level”.*

On page 33, there are several references to “recovery in the aquifer artesian pressure or static water levels”. *We recommend that the use of the word “or” be clarified to recognize the recovery static water levels **are** the recovery of artesian pressure and not an alternative (i.e. the word or).* As an example - “The amount of artesian head recovery, i.e. rise in static water level, in each aquifer...”. *We also recommend that the report further express whether the reduction or recovery of artesian pressure are primarily related to the hydraulics of aquifer transmissivity and pumping rate, or are the expressions of recharge vs pumping rate.*

If you have any questions, please feel free to give me a call.

cc: City of Conroe City Council Members  
LSGCD Board Members