

**Ad Hoc  
Engineering and Operations Committee Meeting**

**Minutes**

**November 4, 2014**

An ad hoc meeting was convened at 11:00 A.M. by Earl Foster, G.M., Tuesday, November 4, 2014, at the Lakeway Municipal Utility District's office located at 1097 Lohman's Crossing, Lakeway, Texas 78734-4459.

The following Engineering and Operations (E&O) Committee Members and General Manager (GM) were in attendance:

Don Walden, *Chairman*,  
Jerry Hietpas, *Board Member and Board Liaison to Committee*,  
Earl Foster, *General Manager, Lakeway M.U.D.*,  
Bob Rives, *Committee Member (Secretary)*,  
Wayne Seime, *Committee Member*.

Member not in attendance:

Pat Rossmiller, *Committee Member*.

Guest attendees were:

Hank B. Smith, PE, Texas Engineering Solutions  
Joe J. Vickers, Professional Geologist, The Wellspec Company

The ad hoc meeting was an informal gathering to talk about the geology of the Lakeway area and to obtain a better understanding of the requirements and problems involved in drilling a pilot ground-water well. Guests were Mr. Hank Smith of Texas Engineering Solutions and Mr. Joe Vickers, a professional geologist with The Wellspec Company. Both gentlemen were kind enough to answer our general questions and expand on the issues with their experience and knowledge.

Mr. Hietpas specified some of our water problems due to the ongoing drought as well as our general understanding of the ground-water sources in the area. Mr. Foster clarified that we needed approximately 400,000-gallons of water-per-day production as our initial requirement for a one-to-four well production scenario. General talks included the requirements for a public water-permit. Further discussions encompassed ground-water compatibility with our water treatment plant. Questions were asked about the quality of water and what we could expect from different reservoirs (i.e., the Hansell Sand, Cow Creek Limestone, and the Hosston Sand). It was mentioned that the West Cypress Hills water supply comes from the Hensell Sand and is basically good water that needs only filtering and chlorination treatment; however, the Hensell

Sand in our area might require additional treatment. Mr. Vickers said the Hensell Sand at West Cypress Hills is very close to the source (i.e., Rain water, Perdenales River, and Lake Travis) whereas the Hensell Sand in our area is further from those sources. Recent wells drilled in the Lake Travis Independent School District and Hurst Creek MUD have indicated high total dissolved solid (TDS) sulfate values in the order of 2000-ppm in the water which would require a costly tertiary treatment. High-sulfate values can not only affect the taste and odor but also the potability of the water. These sulfates could have come from rocks containing gypsum. It was noted that in the treatment of high-sulfate water the disposal of reject water would be a costly problem. The good news was that our guest felt the Lower-Trinity Sand formations would be able to produce good quality water. During drilling the Hammett Shale member of the Trinity Formation was understood to be a problem and would need to be sealed off before drilling into the Lower Trinity (and Hosston Sand member). Mr. Vickers thought that the Sligo Limestone member would be present. However, some geologic literature suggest that the Sligo is not present under Lakeway. Again, Mr. Vickers and Mr. Smith felt that most likely the Hansell Sand would not have the production volume to support our goal. Also, it was pointed out the Hansell Sand could become more shaley and or grade to limestone in our area. It is possible that the Hosston Sand could be in the order of 320 feet thick.

There was a conversation about the apparent artesian pond by RR620. It was suggested that we do "conductivity" tests on the pond as well as some of the standing ponds on Yaupon Golf Course and perhaps also catch some samples for finger printing the waters. It was questioned as to how these ponds maintained year around constant water levels during drought years and just how are they sourced. One thought was that the Yaupon Creek is fault controlled such that a north-trending fault cut the Hensell and Hosston Sands whereby the intermediate Hammett Shale bearer was breached causing pressured water from the Hosston Sand to invade the surface as it moved along the fault line, thus acting in an artesian manner. The other thought was that maybe the water came from the Cow Creek Limestone which is below the Hensell Sand. In either case it would require a fault line to be present for such a migration. Knowing the nature of this water is important as it relates to our potential water production knowledge in the Lakeway area. Is the water from these standing ponds from the Hensell Sand, Cow Creek Limestone, or the lower Trinity sands? If it is from the Cow Creek Limestone then we have a third potential source.

The pilot well itself was then discussed. It was suggested that PVC casing be used (such as SDR 17). This was questioned because of the Hammett Shale's swelling problems. It was theorized that swelling could cause undue pressure on large sized PVC casing it to break or that trying to force plastic casing through the swelling shale could fracture the pipe. More talks included the type of cement to be used as Mr. Vickers commented that Type H cement would be better than Type A because it is more sulfur resistance. Coring was ruled out simply because of the high expense and collecting samples would be enough to determine a general knowledge of the down-hole geology. The type of sand in the Hosston unit could possibly result in a washout depending upon the consolidation of the sand.

Detailed cost of the well was really unknown but basically it would cost about \$65 to \$75 per foot of hole and the total depth of the well would be in the order of about 1,000 feet to drill through the Hosston Sand and TD in the Paleozoic (with some rat hole for logging). A public

well permit would cost about \$10,000-\$20,000; however, a pilot hole does not require a permit since it would not be used for production. Additionally, there would be logging and consulting service fees. Mr. Smith estimated that a normal production well would cost from \$120,000 to \$150,000. A casing plan for the production well would depend upon the results of the pilot hole. The drilling consortium would be required to produce a final report showing the sundry geological information, fresh-water production potential of the well, sustainability of production, and fundamentally how to best set up for production of the ground-water reservoir.

Mr. Smith and Mr. Vickers said they would write up a proposal which would meet our requirements and be applicable with TEQC permit requirements. They will also talk to Central Texas Drilling to obtain some of their expertise in this matter. The proposal should be ready in about two weeks and then presented to the Committee; this will be followed by a proposal to the Board to go forward with the plan. It was noted that we are a public company and bids would have to be issued for the final work.

The meeting ended around 12:30 PM.

These minutes were presented on the 5th day of November, 2014.  
Robert Rives, Secretary, E&O Committee, Lakeway MUD