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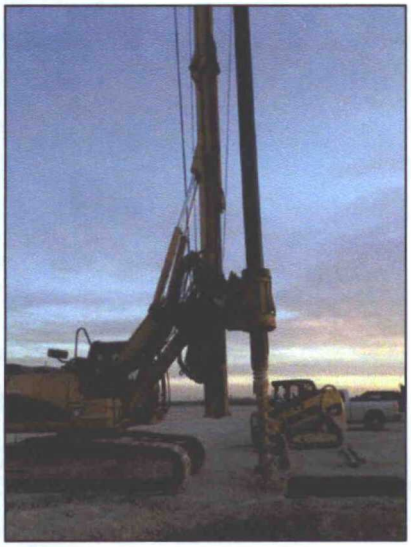
Memorandum

From: Kristin Pope

Date: December 9, 2013

RE: Yates Petroleum, Atoka Bank BDJ State Com 2H, Mouse Hole Evaluation



The Atoka Bank BDJ State Com 2H well site has a surface elevation of 3596 feet and is located approximately 1 mile southwest of the Bell Lake depression area, an ancient collapse feature. Within the Bell Lake Sink shallow (Ogallala or Alluvium) groundwater is known to be present at an elevation of 3,565 feet. The regional groundwater table in this area outside of the Sink is expected to occur at 3,450 feet, or 140-150 feet below the surface of the subject site.

On December 3, 2013 I arrived on site at 2:45 pm when Butch's Rat Hole & Anchor Service of Artesia was in the process of drilling the rat hole to 15 feet. When the rat hole was complete, the drilling of the mouse hole began at 4:50 pm using a track-mounted auger drilling rig as shown in the adjacent photograph.

The 16-inch mouse hole was located directly east of the cellar that contained the conductor and rat hole pipes. Returned cuttings were continuously monitored during each trip as the hole was advanced to 20 feet below ground surface. Lithology was logged and the absence of moisture was noted. At 20 feet, loose, powder-fine sand was encountered that caused a loss of returns. For approximately 1 hour, attempts to advance beyond this depth were unsuccessful. At this point a decision was made to add water to the hole to advance the hole and the rig switched from using an auger tip to a core barrel.

Before leaving the location at 8:00 pm, I provided Butch's Rat Hole personnel with instructions for collecting samples from the remainder of the hole. The following morning I collected the cuttings samples from the driller and discussed the mouse hole drilling. He reported that after adding water at 20 feet, returns were dry by 30 feet where they resumed collecting samples every 10 feet.

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No water or drilling fluids were used during the remainder of the drilling. Examination of the samples revealed that all were dry to the deepest extent of 120 feet. Gray silt and siltstone comprised the samples to 50 feet depth. At 60 feet, the sample consisted of a dark red clay. The remainder of the deeper samples consisted of fine sands, limestone, and then hard, dark gray shale appearing in the 110- and 120-foot samples.

Based on the evaluation of the cuttings it appears that the shallow water table recorded in the Bell Lake wells does not extend to this subject site. I conclude that no groundwater is present below this site to at least 120 feet below ground surface (3,476 feet below sea level).

Kristin Pope

Leking, Geoffrey R, EMNRD

From: Randall Hicks <r@rthicksconsult.com>
Sent: Wednesday, December 11, 2013 5:43 AM
To: Leking, Geoffrey R, EMNRD
Cc: 'Tim Bussell'; Bruce Noles; kristin@rthicksconsult.com; andrew@rthicksconsult.com; Scott Pitts
Subject: Yates - Atoka
Attachments: Atoka3H-Mouse Hole Memo.pdf

Geoff

Our 11/19 submission concludes that depth to groundwater for next well in the Yates drilling program is greater than 120 feet:

Siting Criteria (19.15.17.10 NMAC)
Yates Petroleum Corp – Atoka Bank BDJ State Com 2H

- The perched, shallow groundwater zones present within the Bell Lake Sink and Cotton Place (see Appendix A) do not extend to the area beneath the proposed pit.
- The distance between the bottom of a 10-foot deep temporary pit and the potentiometric surface of the regional aquifer is approximately 136 feet (3,596-10-3450 =) 136 feet.

The mouse hole logging described in the attached memorandum shows we are dry to 120 feet. The driller did a good job in catching cuttings and we feel very comfortable regarding the data in this mouse hole.

If possible, without compromising more pressing matters, we ask you to review the Atoka 2H permit for approval by sometime next week. Yates would like to use the pit at Atoka 2H to recycle brine from the closed-loop drilling of 3H by placing the residual brine in the inner shoe and any recycle any fresh water from the 3H by placing it in the outer shoe of the pit. I will be out there today and will get a better fix on when the location might be ready for installation of a liner – possibly late next week or the week after. With this good groundwater data and our other environmental data, I will suggest the contractor to dig a hole where the pit might be (to withdraw caliche for the pad) in anticipation of permit approval. This action could advance the schedule to allow water recycling and create a smaller environmental footprint by avoiding the hauling of caliche to the location.

Thanks

Randall T. Hicks
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