From:	McCarter, Jennifer
To:	Jacobson, Linda
Cc:	Churchill, Stephen; Bailley, Treasure; Reeves, Molly; Rohr, Matthew; Kilty, Quinn V; Ruch, James E; Bodry, Renee A; Bloomberg, Jon H; Clarke, Roger A
Subject:	RE: request for sampling procedures and well development documentation from Xcel
Date:	Wednesday, November 18, 2020 5:19:19 PM
Attachments:	MW-1B Development Form.pdf MW-2B Development Form.pdf MW-4B Development Form.pdf

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From: McCarter, Jennifer
Sent: Wednesday, November 18, 2020 5:15 PM
To: Jacobson, Linda <Jacobson.Linda@epa.gov>
Cc: Churchill, Stephen <Churchill.Stephen@epa.gov>; Bailley, Treasure <Bailley.Treasure@epa.gov>; Reeves, Molly <Molly.Reeves@hdrinc.com>; Rohr, Matthew <Matthew.Rohr@hdrinc.com>; Kilty, Quinn V <quinn.v.kilty@xcelenergy.com>; Ruch, James E <James.E.Ruch@xcelenergy.com>; Bodry, Renee A <Renee.A.Bodry@xcelenergy.com>; Bloomberg, Jon H <Jon.H.Bloomberg@xcelenergy.com>; Clarke, Roger A <roger.a.clarke@xcelenergy.com>
Subject: RE: request for sampling procedures and well development documentation from Xcel

Hi Linda,

Attached are the development logs for the four new 'W' wells and a brief summary below of well development and sampling procedures. I'll send in a separate email the remaining development logs for the new 'MW' wells and proposed well locations and associated slides we'll talk through on our call next week.

Well development followed the procedures outlined in the Comanche Phased Drill Plan. Wells were surged and purged repeatedly. The Plan states that development will cease when the water is clear and field parameters have stabilized. However, because most wells at Comanche purge dry quickly and recharge extremely slowly, we anticipated that these criteria may not be achievable. In this case, the well was considered developed after being purged of 5 well casing volumes; field parameters were monitored but did not need to stabilize to consider the well developed. In particular, well W-2A was surged and bailed repeatedly over 5 days. During development the well was dried up 5 times and at least 94 liters were purged, equivalent to 17 well casing volumes.

HDR's groundwater sample collection standard operating procedure was originally developed in 2015, and in some cases has been modified over time based on site specific conditions. For example, the use of bladder pumps was developed over time based on observed field conditions. However, the sampling protocols include:

- Measuring static water level in each well prior to initiating purging.
- Low flow purging/sampling using a bladder pump, decontamination of equipment between samples, and collection of an equipment blank during each sample event.
- Measuring field parameters during purging and collecting samples after stabilization of

parameters.

- Samples are not filtered, and pre-preserved bottles are supplied by the laboratory.

At Comanche, a submersible pump was used for the first two sampling events, and since then a bladder pump has been used. In all events, water was removed at the <1 liter/min rate, as suggested in EPA's protocol (actual purge rates are on the order of 0.15-0.4L/minute). Our turbidity criteria prior to sampling is <10 NTU and was achieved in 4 of the first 6 sample events at W-2A (proposed background well). In the other 2 events, turbidity was 114 and 153 NTU; these values are not unexpected for groundwater in colluvium and shale with high clay content. In one of these events the well purged dry (at <0.5 l/min) before sampling the recharge water. In the other event the well was purged for 2 hours, removing 45 liters (12 gal/9 bore volumes) and although the turbidity values did not decrease further, other field parameters stabilized. We continue to think that <10 NTUs is an appropriate turbidity criterion, but on occasions when this criterion can't be met, the sampler uses professional judgment to determine when the sample represents formation water.

Based upon review of the results from the first 5 sampling events in well W-2A, there does not appear to be a relationship between constituents of interest (COIs) concentrations and turbidity. The COI concentrations from these samples are similar enough that even if the results with the higher turbidity values were excluded, the calculated upper prediction limit and the resulting background concentrations (UPLs) would not be affected. Additional data collection from the existing wells, as well as from the future proposed wells will help to confirm if well W-2A remains appropriate as background well for both CCR units.

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From: Jacobson, Linda <Jacobson.Linda@epa.gov>
Sent: Monday, November 9, 2020 2:22 PM
To: McCarter, Jennifer <jennifer.mccarter@xcelenergy.com>
Cc: Churchill, Stephen <Churchill.Stephen@epa.gov>; Bailley, Treasure <Bailley.Treasure@epa.gov>
Subject: request for sampling procedures and well development documentation from Xcel

EXTERNAL - STOP & THINK before opening links and attachments.

Jennifer,

Thank you again for your continuing cooperation and for providing us lab results and water level information. After a quick review, we have concerns with some of the levels being reported. Specifically, looking at some of the results for Xcel-Comanche's proposed or potential background wells (i.e. W-2A, W-2B, W-7), it appears the turbidity results are very high (i.e. >5 NTUs) and may invalidate these background sample results. The very high results for statistical parameters (e.g. B, Ca, Cl, Fl, SO4, TDS) and several hazardous metals (e.g. arsenic, selenium) in these background wells may very well be caused or at least elevated by the acid preservative in each sample bottle leaching these constituents out of the high turbidity in the samples and biasing the total metals and other results high.

We would like to have a call to discuss your current sampling procedures shortly after receipt of the

materials listed below:

1. Well development logs for the new wells (see the attached example). Please note that the attachment is an example, and the well development log used by Dakota/HDR may be different;
2. Sampling Plan and Methodology, including sample collection field procedures, such as identification of purging and sampling methods, pump type, dedicated/non-dedicated, field parameters and stabilization of those parameters prior to sample collection, procedures to reduce sample turbidity, sample containers, preservatives, any field filtering, water level monitoring, etc.

Also, attached are two RCRA Groundwater Sampling guidances that discuss reducing sample turbidity to <5 or <10 NTUs as well as purging and sampling methods that reduce turbidity:

1. RCRA GROUND-WATER MONITORING: DRAFT TECHNICAL GUIDANCE (1992) - see especially pp. 6-48, 6-49
2. Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers (2002) - see esp. pp. 7-8, 10-11

We can offer you the following times (all in MT) for a call: November 23, 10-11 am or 1-2 pm; November 24, 1-2 pm. Please let me know the best time for a short call with you and HDR. If you are prepared, we can also discuss your next stage of well installation at that time and would appreciate submission of the proposed locations and depths prior to a call, if such information is available.

Thank you.

Linda Jacobson