To: Albright, David[Albright.David@epa.gov]; Johnson, AudreyL[Johnson.AudreyL@epa.gov]
From: Rumrill, Nancy
Sent: Tue 9/19/2017 5:42:24 PM
Subject: FW: Suggested language/revisions for UIC Permit

Hi David and Audrey,

I am still working with Jim on final draft language on the Excelsior Draft permit. I will let you know how it's going by the end of the day.

Ex. 5 - Deliberative Process

Nancy

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United States Environmental Protection Agency

Nancy Rumrill (rumrill.nancy@epa.gov)

Drinking Water Protection Section (WTR-3-2)

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From: Alison Jones [mailto:ajones@clearcreekassociates.com]
Sent: Monday, September 18, 2017 12:27 PM
To: Rumrill, Nancy <Rumrill.Nancy@epa.gov>
Cc: stwyerould@excelsiormining.com; Doug Bartlett <DBartlett@clearcreekassociates.com>; Rebecca Sawyer (rsawyer@excelsiormining.com) <rsawyer@excelsiormining.com>; Jay Fumusa (jfumusa@excelsiormining.com) <jfumusa@excelsiormining.com>
Subject: FW: Suggested language/revisions for UIC Permit

Dear Nancy,

Please find below some suggested language, requested by you and Jim during the last call, regarding injection pressure, HC wells, and the "review and approve" timeline. We're happy to discuss this with you on the next call, or before that if you wish.

I (Alison) look forward to seeing you on Thursday morning at the Johnson Camp Mine office. Please keep my cell number with you (520-270-2825) in case you get lost (although it's pretty easy). You are getting off I-10 at the THING exit. There are signs for the THING starting in Phoenix, and they get more frequent as you get close to the site.

4. *Injection Pressure Limitation*

a. Injection wells shall be operated at pressures less than the fracturing pressure of the bedrock oxide zone. Injection pressures are based on the lowest measured fracture gradient for the weakest formation(s) identified in the borehole, multiplied by a safety factor of 0.9. For wells intersecting the Escabrosa Formation, a fracture gradient (after applying 0.9 safety factor) of 0.70 psi/foot (ft) of depth, measured from ground surface to the top of the injection interval, will be used to establish maximum hydraulic pressure that may be exerted on the injection zone. For wells intersecting the Horquilla, Martin, upper Abrigo, middle Abrigo, lower Abrigo, fracture gradients (after applying 0.9 safety factor) of 1.3, 0.94, 1.48, 1.27, and 0.87 psi/ft, respectively, are established. The maximum wellhead pressure will be established for each injection well, and will vary depending on the depth of the interval receiving the injection fluid and the weakest formation in the borehole. For clarity, in calculating the maximum injection pressure at the surface, the fracture gradient of the injection well will be set to the value of the

weakest formation present in that well with the included 0.9 safety factor. In no event shall injection pressure exceed the calculated pressure that can be safely applied to well equipment. In no case shall pressure in the injection zone during injection initiate new fractures or propagate existing fractures in the injection zone or the confining zone. In no case shall injection cause the movement of injectate or formation fluids into a USDW. Injection pressures shall be monitored using a digital instrument and recorded on a daily basis. In the event of an exceedance of an injection pressure limit, Permittee shall implement the actions described in Aquifer Protection Permit, Section 2.6.2.5 and supply all documentation to the EPA for review and approval.

Recommended revisions for Part II.F.5

5. *Hydraulic Control Monitoring Wells*

External monitoring of the ISR process around the perimeter of the Project wellfield shall be conducted to verify hydraulic control. ***This m****~~M~~onitoring of ~~inward hydraulic gradients in~~ the oxide bedrock zone shall be performed using thirty (30) hydraulic control wells and twenty-two (22) paired OWs at the perimeter of the wellfield. Hydraulic control monitoring will entail using the OW pairs for head comparison and for verifying that the head gradient is inward, that is, from the outer OW toward the inner OW and wellfield. Head monitoring will be accomplished using pressure transducers placed in the OWs from which average daily head measurements will be recorded. In addition, the Permittee shall monitor specific conductance in the outer OWs to detect any excursion in accordance with the approved procedures defined in paragraph 6(b) of this Section F . Fluids produced from the HC wells shall be monitored for specific conductance on a daily basis.*

If approved by EPA, ~~an~~ inactive (non-pumping) ***HC*** *~~hydraulic control~~ well****s*** *may be used as an additional monitoring point****s****, in conjunction with IMWs, to monitor for evidence of solution migration.* ***Such well(s) would be monitored for water elevation and specific conductance on the same schedule as outer IMWs and appropriate alert levels would be set for specific conductance.*** *If parameters exceed alert levels in a non-pumping HC well, it should be activated (pumped) as soon as possible and associated OWs shall be installed if they are not already installed. The choice and number of HC and OW locations to be monitored during the three stages of ISR and*

rinsing operations shall be subject to EPA review and approval.

Regarding the "review and approval" language regarding a number of items within the permit, EMI would like to see assurance using language such as:

EPA review and approval will be completed within a reasonable time in light of all the circumstances.

Alison H. Jones, R.G.

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