UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
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DALLAS TX 75202-2733

MAY 16 2012

Mr. Zak Covar
Executive Director,
Texas Commission on Environmental Quality (TCEQ)
Post Office Box 13087
Austin, Texas 78711-3087

RE: Application for Exemption of Portions of the Goliad Aquifer Formation in Goliad County

Dear Mr. Covar:

EPA has been continuing our review of the Texas Commission on Environmental Quality's (TCEQ) August, 2011 letter regarding the aquifer exemption request for Uranium Energy Corp's (UEC) proposed *in situ* leach uranium mining activities in the Goliad Aquifer in Goliad County, Texas. We have had a number of discussions with representatives of UEC and have undertaken further legal and technical analysis. We would like to update you on our thinking about this exemption request and outline a path forward.

As you know, the protection of drinking water is one of the EPA's highest priorities. Working together, the EPA and TCEQ share a long history of cooperation and success with regard to monitoring and protecting drinking water as a critical resource. As always, our respective staffs have discussed the aquifer exemption request in a thorough and professional manner.
In summary, we continue to believe that the criteria for granting an aquifer exemption have not yet been met. For the EPA to approve an aquifer exemption, the Agency must first find that the applicant has demonstrated that the aquifer or the portion of an aquifer identified by the State as exempt "does not currently serve as a source of drinking water" (40 CFR 146.4 (a)). The EPA's examination of TCEQ's aquifer exemption request revealed numerous domestic water supply wells in the area of the requested exemption. Some of these wells are in close proximity to the proposed mining area, and are currently used for drinking water by local residents. This information has been confirmed by an EPA Region 6 site visit and public meetings with the citizens of Goliad County, as well as by the Goliad County government and the Goliad County Groundwater Conservation District in correspondence to EPA dated March 26, 2012. Under these circumstances, we need additional information to conclude that water from the exempt area of the aquifer is not a source for nearby drinking water wells. We believe such information could be obtained from two-phase modeling, although TCEQ or UEC could seek to make the necessary demonstration by alternate methods. We have discussed this modeling with UEC and are describing its scope and objectives more fully below.

As you know, consistent with EPA's longstanding interpretation and application of its regulations, EPA includes a buffer zone around the area requested for exemption to determine whether the exempted aquifer or portion currently serves as a source of drinking water. Attachment 3 of Guidance 34 (July 5, 1984), "Guidelines for Reviewing Aquifer Exemption Requests" provides in pertinent part:

> [A]ll exemption requests must demonstrate that the aquifer ". . . does not currently serve as a source of drinking water." (40 CFR §146.4(a)). To demonstrate this, the applicant should survey the proposed exempted area to identify any water supply wells which tap the proposed exempted aquifer. The area to be surveyed should cover the exempted zone and a buffer zone outside the exempted area. The buffer zone should extend a minimum of a 1/4 mile from the boundary of the exempted area. Any water supply wells located should be identified on the map showing the proposed exempted area.
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> If no water supply wells would be affected by the exemption, the request should state that a survey was conducted and no water supply wells are located which tap the aquifer to be exempted within the proposed area. If the exemption pertains to only a portion of an aquifer, a demonstration must be made that the waste will remain in the exempted portion. Such a demonstration should consider among other factors, the pressure in the injection zone, the waste volume, injected waste characteristics (i.e., specific gravity, persistence, etc.) in the life of the facility.

The letter TCEQ sent to EPA in August 2011 reflects a different view of the information EPA needs in order to approve an aquifer exemption and suggests that completing a well survey is sufficient for approval. However, our guidance indicates only that a well survey may support granting of an exemption if it shows that "no water supply wells would be affected by the exemption." Where – as here – the survey and other information identifies wells within the buffer area that are likely to draw water from the aquifer, the survey should be supplemented with additional information.

TCEQ also appears to interpret our regulations to mean that EPA may only look at whether the drinking water wells in the vicinity are – "at present" – withdrawing the water in the portion of the aquifer proposed for exemption. That interpretation ignores the regulatory text "serve as a source." Determining whether water in a portion of an aquifer is *currently being withdrawn* for use in the present moment is not the same as determining whether a portion of the aquifer proposed for exemption "currently serve[s] as a source of drinking water." Water that currently *serves as a source* of drinking water includes water that is being withdrawn in the present moment *and* water that will be withdrawn in the future by wells that are currently in existence.[1]

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[1] TCEQ cites *Western Nebraska Resources Council v. EPA* ("*WNRC II*"), 943 F.2d 867 (8th Cir. 1991), which was a sequel to *Western Nebraska Resources Council v. EPA* ("*WNRC I*"), 793 F. 2d 194 (8th Cir. 1986). EPA agrees with TCEQ that the Court in WNRC II rejected a challenge to EPA's approval of the aquifer exemption at issue. However, the Court held that EPA's approval was supported by the administrative record, not that there are limits on EPA's evaluation of aquifer exemption requests in general, or the specific inquiry as to whether the portion of the aquifer proposed for exemption meets the regulatory criterion in 40 C.F.R 146.4(a) in that it "does not currently serve as a source of drinking water." To the contrary, in *WNRC II*, the Court acknowledged that EPA has discretion in evaluating aquifer exemptions based on the specific

The EPA's evaluation of TCEQ's aquifer exemption request is governed by the EPA's regulations and application of the regulations to the specific facts. Here, our review of the aquifer exemption application indicates that there are multiple drinking water wells in close proximity to this project and the proposed exempted area appears to be a source of water for those wells. In addition, the ore-containing zones that would be mined are present in all four strata of the Goliad aquifer, and groundwater from all four strata is hydrologically connected to the water drawn by the numerous drinking water wells in the area. It thus appears that groundwater currently moves through the area proposed for exemption on its way to the drinking water wells down gradient. Accordingly, based on the information before the Agency at this time, the EPA cannot conclude that the portion of the aquifer proposed for exemption does not currently serve as a source of drinking water for those wells. Furthermore, the application does not demonstrate that "the waste will remain in the exempted portion" consistent with Guidance 34 (see excerpt above) and, based on EPA's experience with other in-situ mining projects, EPA believes there is a high likelihood that, following mining activities, residual waste from mining activities will not remain in the exempted area.

Nonetheless, these initial indications could be overcome by information demonstrating that the portion of the aquifer proposed for exemption does not in fact currently serve as a source of drinking water for those wells in the vicinity of the area proposed for exemption. As we have discussed with you and UEC, such information could potentially be obtained from a two phase modeling approach.

The first phase would consist of a groundwater transport and capture model to show that all existing drinking water wells in the vicinity of the area proposed for exemption (i.e., at least those wells within or near ¼ mile of the proposed exemption boundary) are not capturing nor expected to capture water from the portion of the aquifer proposed for exemption. EPA believes that the model should examine the remaining lifetimes of the wells. For purposes of this analysis, EPA recommends using a well lifetime estimate of 75 years.

If the results of the groundwater modeling indicate that the wells in existence are not and would not be likely to capture water from the portion of the aquifer proposed for exemption during the lifespan of the wells, a second phase of modeling would help to show, among other things, that

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facts presented: "[t]he regulatory approach adopted here by EPA -- a broad definition of covered underground waters coupled with a discretionary exemption mechanism -- is a common method by which agencies preserve their discretion to regulate equitably on a case-by-case basis." 943 F.2d at 870. Moreover, in WNRC I, the Court spoke approvingly of EPA's consideration of the whole record when it stated that "as was appropriate under the circumstances, a number of other factors were considered and a number of other findings were made by EPA" and those findings "flowed from a reasonable exercise of the agency's particular expertise in the area of environmental safety." 793 F. 2d at 201. One of those factors was that "no significant adverse impact on human health or on the environment as a whole (*including surrounding sources of water*) would result from the limited 6.7 acre exemption. 793 F. 2d at 201 (8th Cir. 1986) (emphasis added).

the "waste will remain in the exempted portion" of the aquifer consistent with Guidance 34. A chemical fate and transport model that builds upon many of the same transport parameters utilized in the first phase of the model referenced above could track the attenuation of contaminant concentrations of the residual plume as it migrates in the post restoration phase until the model shows that the plume would not reach either the existing wells or the non-exempt portion of the aquifer in concentrations harmful to human health.

On January 18, 2012, UEC met with EPA staff and presented an approach to determine whether wells in the Goliad area were drawing on water in the proposed exempted area. UEC's approach used a set of equations to solve for the limits (outer edges) of groundwater entering a well. However, the approach presented did not account for actual variability in geologic and hydrogeologic conditions across the site (i.e., different zones of hydraulic conductivity), could not handle multiple aquifers or regional groundwater stresses, and could not take into account multiple pumping wells. Based on the number of surrounding drinking water wells, all of these parameters would need to be factored into the model. Finally, the modeling approach presented by UEC only accounted for the eight year time period when the mining and associated artificial negative pressure was expected to occur without an explanation of why that period meets the specific characteristics of the site.

Whenever EPA reviews an aquifer exemption application, EPA seeks information sufficient[2] to support that specific aquifer exemption request. The aquifer exemptions for in-situ uranium mining projects that have previously been approved are not in areas where there are several drinking water wells in close proximity to and within the ¼ mile buffer area of the project. This two-phased modeling approach is warranted to protect against endangering the drinking water source here given that there are multiple human water source wells down gradient of and in proximity to the area proposed for exemption, and there is no lateral confinement between the portion of the aquifer proposed for exemption and the portion of the aquifer that would not be exempted.

This two-phased modeling approach could provide a pathway for EPA to approve the aquifer exemption consistent with EPA regulations and longstanding guidance.

I hope that the information provided in this letter makes clear the necessity and rationale for the additional information we previously requested. I believe that EPA and TCEQ share the mutual goal of assuring that our actions do not adversely affect the critical sources of drinking water. Working together we can meet that goal. Our technical staff is ready to discuss both modeling

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[2] Region 6 has approved over 30 aquifer exemptions related to in-situ mining activities in the past -- an indication that we support such proposals when it can be demonstrated that they meet the regulatory criteria for EPA approval based on the specific facts. Region 6 has also disapproved an aquifer exemption request because the portion of the aquifer proposed for exemption currently served as a source of drinking water for an existing water supply well. Region 6 also approved another exemption only after the permit applicant agreed to plug downgradient wells and provide an alternate source of drinking water for the well owners.

phases in greater detail at your request and to continue its ongoing dialogue with UEC. Should you wish to discuss this letter, please contact myself or Mr. Philip Dellinger, Chief of the Ground Water/UIC Section at (214) 665-8324.

Sincerely yours,

William K. Honker, P.E.
Acting Director
Water Quality Protection Division

Enclosure

cc: Charles Maguire, TCEQ