

**GOLIAD COUNTY GROUNDWATER CONSERVATION DISTRICT**

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Texas Commission on Environmental Quality

The Honorable LaDonna Castanuela

Chief Clerk

MC-105, TCEQ

P. O. Box 13087

Austin, TX 78711-3087

Re: PRESENTATION FOR 1-24-08 TCEQ PUBLIC MEETING

My name is Art Dohmann. I am speaking on behalf of the Goliad County Groundwater Conservation District (GCGCD). I wish to thank the staff of Texas Commission on Environmental Quality for providing this opportunity of a public meeting to discuss the application for a new underground injection control proposed Permit No. UR03075.

What is the groundwater district's role in this issue? The Texas Water Development Board and groundwater districts are charged by State statute to manage the quality and quantity of groundwater supplies in the State of Texas.

Uranium ore is in the groundwater sands as pancake deposits. In the proposed mining permit area, these deposits exist in all four of the shallow sands from which area wells pump water for domestic and livestock use. There are approximately 5000 water wells in Goliad County, an average of 1 well per 100 acres. In the proposed uranium mining site, several hundred exploration wells have already been drilled. The permit application states that it is estimated that 3,520 additional wells will be drilled to various depths as deep as 400 feet to mine the 4-40 acre uranium deposits. This gives a concentration of over 20 wells per acre in the mining area. The initial concern of GCGCD is the mechanical damage to the aquifer followed by the potential contamination of the aquifer and the loss of water supplies.

The UEC uranium mining permit application UR03075 being discussed is located in the RRC exploration permit #123 area of 10,701 acres in north-northeast Goliad County. Only a portion of the 10,701 acres has been leased for uranium exploration and mining. There has been extensive borehole drilling in the proposed uranium mining area penetrating the top four sands of the Evangeline (Gulf Coast) Aquifer. Exploration borehole drilling is continuing in other areas of the RRC #123 permit. The proposed

mining areas and associated aquifer exemptions are subject to modification due to ongoing development as noted in the application.

Within and contiguous to the RRC exploration permit #123 area, according to appraisal district records, there are at least 93 private residences. These residences along with cattle operations are supplied groundwater by 168 water wells registered with the Goliad County Groundwater Conservation District. No mention is made in the mining applications of the use of this water for human consumption noting that water use is “namely, livestock and crop watering”. In addition to the residences and water wells noted, there are many more immediately downdip of the potential uranium mining operations.

When considering the numerous natural and man-made surface obstacles (such as homes, ranching facilities, stock tanks, etc.) and the aquifer undulations, noted faults, and other uncertainties, how can there be any practical assurance that the quality of the area groundwater can be protected? Will the stable uranium deposits be only partially accessed but disturbed sufficiently to make restoration a practical impossibility?

#### **SECTION 11: Hydraulic Test Preparation**

Will TCEQ consider the stratigraphic and structural complexity of the mining area when evaluating the monitor well spacing design in accordance with 30 TAC 331 subchapter F, Rule 331.103?

Why is TCEQ evaluating a permit before aquifer pumping tests are performed to determine the degree of hydrologic connection between the sand zones? How can TCEQ grant a permit without having this hydrologic data?

Section 11.1.1 is confusing to the reader as it discusses monitoring wells and observation wells. This entire discussion needs to be clarified. In addition, it states that monitor wells are to be completed in the sands overlying the production zone. Should there also be a requirement for monitor wells to be completed in the sands underlying the production zone?

TCEQ recommends three observation wells for hydrologic testing. Will TCEQ require one well to be above the producing sand zone, one well in the producing sand zone, and one below the producing sand zone? Why does TCEQ evaluate a permit before hydrologic data are collected?

Will TCEQ make the hydrologic data available for an independent assessment of the hydrologic properties?

### **Section 8: Mine Plan**

UEC assumes 6 pore volumes will be sufficient for restoration because restoration activities begin as soon as the production phase is completed. What is the basis for this assumption when other ISL facilities have required many more pore volumes in an attempt to achieve baseline conditions? What is the plan of action for bonding, groundwater use, and disposal, if it is found that more than 6 pore volumes are required?

In reference to water supply and quality, the mining application makes reference to Dale et al 1957 (50 year old data), making comments about small supplies of variable quality water. Current water data needs to be utilized for water management. With the exception of a few wells immediately down-dip of the borehole exploration area and the wells that turned dirty and became contaminated with iron bacteria, water quality is good in the exploration area and across Goliad County. GCGCD is providing to TCEQ a complete package of test data to verify the good water quality and the latest update to the RRC on the dirty well issue.

The mining permit application identifies the water use and associated handling equipment sized to accommodate the mandatory 1% bleed water and a projected use for restoration. The permit application accurately discusses the need for overproduction to prevent mining fluids from migrating vertically and horizontally, but no management plan is provided to address this condition.

The simulation study prepared by Daniel B. Stephens (copy provided) raises serious questions about the amount of bleedwater (overproduction) that may be required and the potential for vertical leakage contamination of water supplies outside of the production sand.

### **Section 6: Hydrology**

Given the Daniel B. Stevens model uses homogenous conditions in the aquifer, the extraction wells do not capture 100% of the pregnant lixiviant in a 3 year mining period. Therefore, how can UEC assure, given the added complexity of aquifer heterogeneities that are obvious on cross sections provided in section 6 of the application that escaping contamination will be detected by a monitoring well ring that is based on a spacing of 400 feet and takes no consideration of the variation of sedimentary structure?

Are the wells used for establishing baseline and restoration compliance screened to sample the water through the entire thickness of the sand; or are they screened only in the ore body section which comprises a small percentage of sand thickness?

Given Daniel B. Stephens model shows vertical communication from the A to the B sand, will a monitoring well ring be placed in both A and B sands during production

and restoration? This similar question applies to production and restoration in other sands.

The potential for overproduction bleedwater increase above the 1% mandated, the potential to have to clean up a non-uranium bearing sand due to vertical leakage, and the potential need of more water exchanges during restoration raises a serious question of depletion of area water supplies. It is requested that a model be prepared to define the water use limits that will not affect existing water wells. The model needs to be prepared in advance of a contested case hearing with ample time provided for analysis.

The mining permit application uses inconsistent data on the Gulf Coast Aquifer in the mining area relating to confining conditions, and is based on a fundamental misconception concerning the characterization of this aquifer. Current data including that used by the Texas Water Development Board for groundwater modeling shows the aquifer sands in the proposed mining area to be in the recharge zone and are unconfined. Modeling shows vertical leakage and this is a very critical water quality issue.

The methodology used by UEC to establish baseline data for groundwater quality restoration is not accepted by Goliad County Groundwater Conservation District and their consultants. The wells from which baseline water samples were taken were drilled after extensive borehole drilling and in close proximity to boreholes. The water quality data taken before extensive exploration from existing area wells does not support the high levels of contamination seen in the baseline wells being offered as pre-existing water quality.

## **SECTION 5: Water Use and Water Quality**

### **Baseline Monitor Wells**

Establishing baseline water quality values in the mining zone:

Baseline water quality for a given sand zone should be established for the column of water across the sand zone as this is the target for private use. The water quality data from user wells in the ore zone have much lower values for Radium and uranium relative to values collected from UEC baseline wells.

If a production sand zone is 75' thick and the ore thickness within that zone is 20' thick, is it statistically valid to collect a baseline water sample only from the ore layer in the water sand?

In evaluating groundwater quality data what valid statistical procedures are used to test the sample populations for normal or log normal distributions?

Is it a policy of TCEQ to allow sample averaging of data when it does not follow a normal or log normal distribution?

If the monitoring well ring is the point of compliance for restoration, is it statistically valid to collect baseline samples only from within the ore zone?

Were the samples collected from a well that was screened only in the ore zone or across the entire thickness of the sand? Are the baseline monitor wells located randomly across the extent of the proposed well fields or biased towards the most concentrated ore zones? Is there a sampling plan that prescribes how to locate the baseline monitor wells? Is there a procedure for collecting the water samples including purging, stabilization and filtering?

## **SECTION 12: Restoration**

We agree that a proper baseline needs to be established. The problem arises in defining what component of the aquifer needs to be restored.

The discussion on baseline leads one to believe that the pregnant lixiviant will not leave the ore zone. The Daniel B. Stephens Model shows that the lixiviant will leave the ore zone. What are the vertical and horizontal boundaries of the water that needs to be restored?

There is no discussion in Section 12 on the number of pore volumes that will be used to restore the aquifer. Why does TCEQ not require a detailed discussion for this important parameter?

Section 12 also lacks a discussion on the long term monitoring during and after restoration. How frequently will UEC sample the monitoring wells after restoration to demonstrate that contaminant levels have not increased and for how long?

The required aquifer exemption cannot be granted and meet the conditions specified for an aquifer exemption. This unconfined and continuously moving aquifer water has been used, is currently being used, and will be used in the future by many residents living, working and hunting in the area. Failures from previous ISL mining operations to restore groundwater must be considered in this evaluation.

## **SECTION 14: Aquifer Exemption**

Figure 1.3 shows the lateral extent of the proposed aquifer exemption zone extends beyond the ore zone. The vertical extent is stated to be from the base of D sand to the top of the A sand. The ore zone in this proposed aquifer exemption zone is only a fraction of the total aquifer exemption volume. Is TCEQ allowing baseline to be

established with water samples collected only from ore zones? What is the statistical justification for this approach?

This section notes each sand unit as being confined on top and bottom by substantial aquicludes. TWDB Gulf Coast GAM, Daniel B. Stephens & Associates Model and Groundwater of Goliad County, Dale et al 1957 (page 12) indicate that there are not confining layers between the sands. What is the basis for UEC stating that confining layers are present prior to their hydrologic testing?

Goliad County Groundwater Conservation District wishes to incorporate this information with that provided by letter (attached) to TCEQ dated November 5, 2007 which included a request for this public meeting. GCGCD appreciates the granting of this public meeting by TCEQ and our opportunity for formal comment.

Sincerely,

Goliad County Groundwater Conservation District  
Board of Directors

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