

QUESTIONS REGARDING URANIUM ENERGY PERMIT APPLICATION

Section 6: HYDROLOGY

Transmissivity around faults:

Given that there are variations in the grain size in the sand zones and faults adjacent to the ore bed will there be variations in the hydraulic conductivity within the sand zones? How will this add to the problem of not capturing all the lixiviant by the extraction wells during production and reclamation?

Why is there no discussion of the transport of uranium from the underlying Catahoula Tuff to the Goliad Sands via the fault zones?

Please refer to the following references.

Reference:

Henry et al, 1982 (p. 46) "Geochemistry of Groundwater in the Miocene Oakville Sandstone – A major aquifer & uranium of the Texas Coastal Plain" Report #118, Bureau of Economic Geology, University of Texas at Austin.

McKnight, 1972 (p. 102) "A Review of South Texas Uranium Geology" Transactions – Gulf Coast Association of Geological Societies.

Henry & Kapadia, 1980 (p. 4) "Trace Elements in Soils of the South Texas Uranium District: Concentrations, origin and environmental significance" Report #101, Bureau of Economic Geology, University of Texas at Austin.

Section 7: GEOLOGY

It is noted that the sands containing the ore bodies thin and thicken in a curving pattern.

Given the complexity of this pattern, how can UEC ensure that randomly spaced monitoring wells at a 400' interval will capture an excursion traveling down one of these channels?

What is the basis for UEC's stating and depicting the formation between the sand zones as a clay barrier? The Goliad formation is described as predominantly sand with minor clay and gravel.

Cross sections provided in the permit show suggested confining zones thinning to as little as 20'. Given the complexity of the grain size distribution in the sands, how does UEC know that their proposed confining zone is present across the entire mining zone?

Section 8: MINE PLAN

UEC states that plugging will be in accordance with a TCEQ plan. What is TCEQ's requirement for plugging?

The mine plan is very brief on details and lacking any discussion of health and safety issues including monitoring of spills from ruptured pipes and valves in the mine fields, air monitoring in the yellow cake drying and packaging facility, and contingency plans for responding to spills and particulate releases from the yellow cake processing facilities? Will this be covered in the surface permit application?

Section 9: WELL FIELD AND PROCESS PLANT DETAILS

The process flow diagrams contained within section 9 are in general of insufficient detail to tabulate process flows. How has TCEQ prepared their detailed balance sheets from this diagram? What provisions will be provided to handle any significant change in quoted flows?

UEC is applying for a Class I, nonhazardous waste disposal well. Is this based on table 9.1 which reports estimated byproduct wastewater composition? If Table 9.1 is a poor estimate of the wastewater composition and this cannot be achieved and the composition is hazardous; who monitors for that event and is the permit still valid?

The permit states that well integrity is met if a pressure of 100 psi is within 10% of value over a period of thirty minutes. Does this 10% represent the uncertainty of the pressure measurement? If the uncertainty of the measurement is less than 10 percent of the initial value, why is a larger percentage being allowed for the well?

The permit refers to designated monitoring wells being sampled every two weeks for control parameters. Is a designated monitoring well every monitoring well in the ring or a select few? If only a select few, what is the basis for selecting the wells that will be monitored?

Proposed control parameters include chloride, sulfate, TDS and electrical conductivity. Although chloride is stated as providing the earliest warning, there is no discussion to support this contention. In fact, it is noted that the barren lixiviant can be treated with RO to decrease chloride and other ion concentrations prior to reinjection. What is the basis for using chloride when chloride should not be at elevated levels when the lixiviant is reinjected? Additionally, electrical conductivity can be measured remotely in the well on a continuous basis. Does TCEQ consider this to be a reasonable monitoring approach for the monitor well ring?

The permit states that uranium is not used for a control parameter as it does not readily move through the aquifer. This is in conflict with the in-situ uranium leach process as outlined on page 9.2 of the permit. Uranium is mobilized by oxidation and complexation with carbonate. In its mobile form as a negatively charged ion, uranium readily moves through the aquifer to be recovered by the extraction wells. The Daniel B. Stephens Model shows that the extraction wells will not recover all the lixiviant in a three year period. What scientific basis is the NRC and TCEQ using to exclude the use of uranium as a control parameter for detecting excursions?

It is noted in the permit that TCEQ will set the upper control limit for the control parameters for excursions. What is TCEQ's protocol for establishing the upper control limits? Does TCEQ justify their control limits using a valid statistical approach?

Under excursion prevention there is a provision requiring the monitoring of specified wells within ¼ mile of the injection site at least every three months. How will the specified wells be selected?

Section 10: FLUID HANDLING CAPACITY VS. REQUIREMENTS

Does TCEQ have a requirement for a water management plan?

UEC states that a conservative assumption is a rainfall factor of 2.5 inches per month. How can TCEQ consider this to be a conservative assumption when the average rainfall for several months of the year exceeds 5 inches per month?

UEC plans to permit 2 Class I non hazardous waste disposal wells. What is the justification for the non hazardous waste classification when during dry months the injected fluid can be only the RO brine which can contain toxic elements above the EPA drinking water standard?

Table 10-1 is based on a proposed 1% bleed from the production zones and 6 pore volumes for restoration. Will TCEQ require a contingency plan from UEC to address a higher bleed during production and greater number of pore volumes for restoration?

Section 13: WELL PLUGGING AND ABANDONMENT

What plugging procedure is this cost estimate based on?