



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8

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Ref: 8WP-SUI

FEB 10 2017

Mr. Kevin Frederick  
Wyoming Department of Environmental Quality  
Water Quality Division  
200 West 17<sup>th</sup> Street  
Cheyenne, Wyoming 82002

Re: Class III Aquifer Exemption Request, Uranerz Energy Corporation  
Campbell and Johnson Counties, Wyoming

Dear Mr. Frederick:

The U.S. Environmental Protection Agency Region 8 has reviewed Wyoming Department of Environmental Quality's (WDEQ's) aquifer exemption request for the proposed designation of a limited portion of the Wasatch "A" and "B" Sands as exempted aquifers.

This request is in connection with the Class III Nichols Ranch Uranium In-Situ Recovery (ISR) Project proposed by Uranerz Energy Corporation for their ISR mining activities.

**APPROVAL OF PROPOSED AQUIFER EXEMPTION:** Based on review of the supporting information provided by the WDEQ, the EPA hereby approves a non-substantial program revision (40 CFR §§ 144.7 & 145.32) to include exemption of a portion of the Wasatch "A" and "B" Sands associated with the Jane Dough amendment, located in Township 43 North, Range 96 West, Campbell and Johnson Counties, Wyoming. The depth and extent of the aquifer exemption are as follows:

The portions of the Wasatch "A" and "B" Sands shown in Attachment 1 accompanying WDEQ's aquifer exemption request. The thickness ranges from 160 to 350 feet and averages 250 feet.

Based on our review of the information provided, the EPA concurs with the WDEQ's conclusions concerning the aquifer exemption criteria listed below:

- it does not currently serve as a source of drinking water (40 CFR §146.4(a)), and
- it is mineral producing and can be demonstrated to contain minerals that, considering their quantity and location, are expected to be commercially producible (40 CFR §146.4(b)(1).)

This approval applies to the location and the injection activities described herein. Additional approvals may be required for additional injection activities.

**OVERVIEW:** The "A" and "B" Sands contain uranium mineralization and are the production zones at the Nichols Ranch ISR Project. The "A" and "B" Sands produce sufficient quantity of groundwater to supply a public water system and the total dissolved solids ranges from 299 to 715 mg/L. Currently, there are no known domestic drinking water wells completed into the "A" and "B" Sands within two miles of the proposed exemption area. The overlying AB and CB mudstones range from approximately 10 to over 100 feet thick and the underlying 1A mudstone aquitard ranges from approximately 30 to over 100 feet thick within the mine permit area. During the public comment period, no comments were received.

Enclosed please find the Record of Decision (ROD) which supports this decision by the EPA. The ROD includes additional background information, detailed analysis and discussion of any public comments. Should you have questions or concerns, please contact Wendy Cheung of my staff at (303) 312-6242.

Sincerely,

A handwritten signature in black ink, appearing to read 'Darcy O'Connor', with a long horizontal line extending to the right.

Darcy O'Connor  
Assistant Regional Administrator  
Office of Water Protection

Enclosure

cc: Mr. Don Fischer, WDEQ  
Ms. Lily Lee, WDEQ  
Mr. Kyle Wendtland, WDEQ

**U.S. EPA Region 8  
Underground Injection Control Program**

**AQUIFER EXEMPTION RECORD OF DECISION**

This Record of Decision provides EPA's aquifer exemption (AE) decision, background information concerning the AE request, and the basis for the AE decision.

**Primacy Agency:** Wyoming Department of Environmental Quality (WDEQ) 1422 Program

**Date of Aquifer Exemption Request:** Received November 10, 2016, public comment period ended January 23, 2017.

**Substantial or Non-Substantial Program Revision:** Non-Substantial

This is a non-substantial program revision because it is associated with the issuance of a site-specific Class III UIC permit action. This decision is consistent with the EPA's "Groundwater for Review and Approval of State Underground Injection Control (UIC) Programs and Revisions to Approved State Programs" (Guidance 34). This document explains that the determination as to whether a program revision is substantial or non-substantial is made on a case-by-case basis, and with the exception of AEs associated with certain Class I wells or exemptions not related to a permit action, AE requests are typically treated as non-substantial program revisions.

**Operator:** Uranerz Energy Corporation (Uranerz)

**Well/Project Name:** Nichols Ranch Uranium In-Situ Recovery (ISR) Project, Jane Dough Amendment

**Well/Project Permit Number:** Permit to Mine 778

**Well/Project Location:** Sections 20, 21, 27-30, 32-34 Township 43N, Range 76W, in Campbell and Johnson Counties, Wyoming

**Well Class /Type:** Class III Uranium ISR

**DESCRIPTION OF PROPOSED AQUIFER EXEMPTION**

Uranerz currently operates the Nichols Ranch Uranium ISR project in Campbell and Johnson counties in Wyoming, which consists of 3 units: Nichols Ranch, Hank, and Jane Dough. The Nichols Ranch and Hank units have been permitted and aquifer exemptions were provided on January 14, 2011. The Nichols Ranch began operations in 2014. This aquifer exemption is for the area known as the Jane Dough amendment. The Jane Dough amendment consists of an area immediately to the south of the existing Nichols Ranch unit operations. The projected start date for Jane Dough amendment is 2019 and will utilize the existing uranium processing infrastructure already in place for the Nichols Ranch unit.

**Aquifer(s) to be Exempted:** Wasatch "A" and "B" Sands

**Aquifer(s) Water Quality - total dissolved solids (TDS):** The total dissolved solids for the "A" and "B" Sands ranged from 299 mg/L to 715 mg/L, with an average of 350 mg/L.

**Depth and Thickness of Aquifer (feet):** The uranium deposits are found within the production sand occurring at an average depth of 500 feet below ground surface. The thickness ranges from 160 feet to 350 feet thick and averages approximately 250 feet.

**Areal Extent of Aquifer:** The proposed exemption area will be for the “A” and “B” Sands plus a buffer zone of approximately 195 feet beyond the excursion monitoring wells as shown in Attachment 1.

**Confining Zone(s):** The AB mudstone and CB mudstone directly overlie the “A” and “AB” Sands, respectively. Where the “A” and “B” Sands merge, the CB mudstone is the overlying aquitard. The AB mudstone ranges in thickness from 10 to greater than 100 feet. The CB mudstone varies from approximately 30 feet to over 100 feet. Immediately underlying the “A” and “B” Sands is the 1A mudstone aquitard and its thickness varies from 30 to 100 feet.

**Underground Sources of Drinking Water (USDWs):** The Wasatch (including the “A” and “B” Sands), Fort Union, Lance and Fox Hills formations are USDWs within the permit area.

**Injectate Characteristics:** During mining, the injection fluids will include the recovery fluid, or lixiviant (made up of an oxidant and a complexing agent of sodium carbonate, sodium bicarbonate or carbon dioxide added to the native groundwater). During the groundwater restoration phase, the injection fluids include recovery well fluids, RO permeate with reductant addition, and native groundwater.

## **BASIS FOR DECISION**

### **Regulatory Criteria under which the exemption is approved**

**40 CFR § 146.4(a)** *It does not currently serve as a source of drinking water*

A two-mile radius from the proposed aquifer exemption area was surveyed for drinking water wells. Within the area proposed for exemption, the “A” and “B” Sands are not used for drinking water. The nearest domestic wells are a mile or more from the Jane Dough amendment exemption boundary. Three existing domestic wells (Garden, Doughstick #3 and Brown #4) are located to the east of the aquifer exemption boundary in the southeast quarter of Section 22, T43N R76W. The Garden and Doughstick #3 wells are completed in the “A” Sand and are cross-gradient from the natural groundwater flow in this area (see “A” and “B” Sands flow direction shown on Attachment 1). The Brown #4 well is also located in this area, but the well depth was not provided in the State Engineering Office (SEO) database. Even if it was completed in to the “A” and “B” sands, the well is also cross-gradient. As such and at distances of a mile or more, these wells are unlikely to utilize the aquifer within the exemption area as a source of drinking water. The natural groundwater velocity in this area is 12 ft/year, which for a 30-year evaluation period would equate to approximately 360 feet. The last well found within the two-mile search radius is the Dry Fork #1 in the northeast quarter of Section 24, T43N R77W. This well is downgradient and 1.75 miles northwest from the edge of the aquifer exemption area. Based on evaluation of electronic logging of this well, Uranerz concluded it is completed in the 1 Sand, below the “A” and “B” Sands and the lower confining unit. Furthermore, the SEO database shows that this well permit has expired. Based on the location of the domestic wells in the vicinity of the AE area, it is concluded that it does not currently serve as a source of drinking water.

There are no public water supply (PWS) wells within 4 miles of the facility that uses the “A” and “B” Sands. Uranerz operates the only public water supply within four miles of the aquifer exemption area in Section 17, T43N R76W. The well is drilled to a depth of 814 feet and according to Uranerz, the well is completed into a sand unit below the “A” and “B” Sands and the lower confining unit.

#### **40 CFR § 146.4(b)(1)**

*It cannot now and will not in the future serve as a source of drinking water because:*

*It is mineral, hydrocarbon, or geothermal energy producing, or can be demonstrated by a permit applicant as part of a permit application for a Class II or III operation to contain minerals or hydrocarbons that considering their quantity and location are expected to be commercially producible.*

Numerous companies over a 50-year period have drilled exploratory holes to assess the availability of uranium resources. In the Jane Dough area, Uranerz has estimated uranium oxide (U<sub>3</sub>O<sub>8</sub>) resources to be 4,237,000 pounds. Uranerz is already operating in the Nichols Ranch unit just north of the proposed Jane Dough amendment and will utilize the existing infrastructure to develop the resources at the Jane Dough amendment.

#### **Other Considerations**

WDEQ has also demonstrated that fluids injected or mobilized will remain within the aquifer exemption boundary. WDEQ and the applicant have identified upper and lower confining units to contain the fluids from migrating to USDWs above and below the "A" and "B" Sands. For successful and efficient uranium production, hydraulic control or an inward hydraulic gradient must be maintained at all times. Uranerz will establish a monitor well network comprised of excursion wells (or the monitor well ring) and wells completed in the underlying and overlying aquifers. The function of the monitor well network is to detect recovery solutions that may migrate away from the production area and allow Uranerz to correct the wellfield imbalance before contaminants move out of the AE area.

After the operational phase, the operator is required to perform groundwater restoration under their NRC license. The groundwater will be cleaned up to a standard that will be similar to pre-mining conditions.

#### **PUBLIC COMMENTS**

No comments were received during the WDEQ Water Quality Division's public comment period regarding WDEQ's groundwater reclassification and proposed aquifer exemption.

#### **CONCLUSION AND DECISION**

Based on review of the entire record, EPA finds that exemption criteria 40 CFR § 146.4(a) and 146.4(b)(1) have been met and EPA approves the AE request as a non-substantial program revision.

