RAS B-19 "EXHIBIT A"

U.S. NUCLEAR REGULATORY COMMISSION
In the Matter of Crowe Butte Resources, Inc
Docket No. 40-8943-MLA Official Exhibit No. A
OFFERED by: Applicant/Licensee Intervenor
NRC Staff Other
IDENTIFIED on 1-16-08 Witness/Panel N/A
~~Action Taken: ADMITTED REJECTED WITHDRAWN~~
Reporter/Clerk Thibault

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OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

Subject: Fw: geology summary
Date: Monday, January 14, 2008 10:55 AM
From: buffalobruce@juno.com
To: <dfrankel@igc.org>
Cc: <slmbttsag@bbc.net>
Conversation: geology summary

--------- Forwarded message ----------
From: Hannan Lagarry <hlagarry@csc.edu>
To: buffalobruce@panhandle.net, buffalobruce@juno.com
Cc: mleite@csc.edu, lveath@csc.edu
Date: Mon, 14 Jan 2008 13:41:48 -0700 (MST)
Subject: geology summary
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Buffalo Bruce-

Sorry about the delay in getting this to you. I'm not a hydrologist, but a stratigrapher and geologic mapper (CV attached), and I wish I had more time to gather facts. After talking to the other CSC geologists, we are reluctant to put forward our unpublished work in this matter, since its scientific credibility has not bet confirmed by the peer-review process. However, there is some published material available, and it can be used to make these points.

I don't have WordPerfect. CSC uses Microsoft Office. Therefore, I'm going to type it right into this email.

Based on a review of the available literature, there are four main points.

1. Assumptions about the subsurface geology of western Nebraska (Collins & Knode, 1984) based on geological assessments of the "basal Chadron" by DeGraw (1982) are incorrect after the studies of Evans & Terry (1994), Terry & Evans (1994), and Terry (1998). Simply put, the latter work determined that the "basal Chadron" is part, but not all of, the Chamberlain Pass Formation, and DeGraw's work only delimited part of these rocks, the total distribution of which is currently unknown. This means that our ability to predict where water in the "basal Chadron" is and where it is going is not as good as we thought.

2. Swinehart & others (1985) showed that parts of the subsurface Chamberlain Pass Formation (some of the largest sandstone channels) trend from Crawford, Nebraska to the north generally southeastward to

Bayard, Nebraska to the south. The underground flow of water in western Nebraska follows this same trend, and also intersects the cone of depression produced by center-pivot irrigation in central Box Butte County (Pettijohn & Chen, 1984). This cone of depression is drawing water from the northwest to the southeast, towards Alliance and the North Platte River Valley.

3. The High Plains Aquifer is highly fractured and faulted in some areas, including the Pine Ridge of northern Sioux, Dawes, and Sheridan counties in Nebraska (Diffendal, 1994). These faulted zones contain groundwater, and are considered Areas of Critical Concern by the Upper Niobrara/White Natural Resource District (Upper Niobrara White Natural Resource District Groundwater Management Plan section 7). Swinehart & others (1985), based on exhaustive compilations of well data, showed that many of these fault zones connect the High Plains Aquifer and the uranium-bearing sandstones of the Chamberlain Pass Formation ("basal Chadron" of their terminology). The Upper Niobrara/White NRD recognizes the potential for contamination of both surface and subsurface water from uranium mining in Dawes County (Upper Niobrara White NRD Groundwater Management Plan section 7.5), and that their planned use of the fault zones for residential, municipal, and agricultural use increases the likelihood of drawing up contaminated water from below (Upper Niobrara White NRD Groundwater Management Plan section 7.5).

4. While few gelogists would contest that potential contaminants from surface spills north of the Pine Ridge would likely be contained by the Pierre Shale (although still a source of contamination of the White River's alluvium), surface spills south of the Pine Ridge would be transmitted through porous sandstones of the Ogallala and Arikaree groups directly into the High Plains Aquifer (Swinehart & others, 1985).

References

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Evans, J. E. & Terry, D. O., Jr. 1994. The significance of incision and fluvial sedimentation in the basal White River Group (Eocene-Oligocene), badlands of South Dakota, USA. Sedimentary Geology 90:137-152.

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