

Rod Knudson Content for #3

My reasons for opposing Powertech's mining permit for the Dewey Burdock area are based on my reading of the 2007 NRC publication NUREG/CR-6870 entitled "Consideration of Geochemical Issues in Groundwater Restoration at Uranium In-Situ Mining Facilities. The reasons are enumerated as follows:

- 1) Although the lixivient solutions containing sodium bicarbonate (NaHCO_3) and an oxidizer such as oxygen (O_2) are relatively benign the products they release are not. They include radio-active elements uranium, thorium and all their daughter nuclides in the decay series as well as arsenic, selenium, vanadium, molybdenum and many others that if imbibed in the water supplies will cause significant biological damage.
- 2) Over the period of the mining process much lixivient is lost in the pore spaces of the rock strata in which the mined aquifer exists and cannot be recovered in spite of multiple pore volume sweeps conducted after mining has ceased. This condition coupled with upgradient recharge water continues to oxidize and put into solution the toxic and radioactive elements listed above long after the mining operation has ceased and attempts at restoration are complete.
- 3) The mining process eliminates a major barrier to the migration of these substances through the oxidation of the iron pyrite that had formed a reducing zone behind the ore body. This will allow the elements in question to remain in the oxidized state and in solution longer and potentially flow further into the aquifer.
- 4) Restoration following the cessation of mining consumes an enormous amount of water and in concert with the injection of hydrogen sulfide (H_2S), may take five to ten years to reduce the levels of the elements to the lowest levels achievable, often not close to baseline; e.g., examples cited by the NRC at the Smith Highland ranch near Douglas, WY in the NUREG document cited above left arsenic at 30X, selenium at 70X and uranium at 70X baseline levels eight years after the cessation of mining operations.
- 5) It is highly likely that the 3000 bore holes previously drilled while prospecting for uranium have only been capped and not plugged. A six inch borehole 600 feet deep and 6 inches in diameter would require 4.4 cubic yards of materials while a four inch hole of the same depth would require slightly less than 2 cubic yards. A one cubic foot bag of bentonite doesn't begin to fill such holes.
- 6) Abundant opportunities for excursions from the mining operation exist because of the bore holes from previous explorations and peculiar geologic conditions including breccias pipes and stepped beds. The excursions would be both horizontal and vertical and would jeopardize drinking water aquifers people use on a daily basis.
- 7) Because water tests detailing the elements in question are relatively expensive, the results may only be known years later in the form of cancer clusters and birth abnormalities.
- 8) Without potable water land values would plummet.
- 9) Corporations do not sufficiently share in the risks that residents surrounding the mine do as most bonds cover little more than land disturbances and not threats to public health. The latter typically manifest themselves long after the bond has been released.