14 Mineral Processing and Metallurgical Testing
(Item 18)

Section 14 is extracted in-part from Powertech's Technical Report titled "Updated Technical Report on the Centennial Uranium Project, Weld County, Colorado", dated February 25, 2010. Changes to standardizations, sub-titles, and organization have been made to suit the format of this Technical Report. SRK comments and opinions, where present, contain "SRK" in the pertinent sentences and paragraphs.

14.1 Mineral Processing/Metallurgical Testing Analysis

Powertech conducted leach amenability studies on uranium core samples obtained in the previously described coring program. The tests were conducted at the ELI Casper facility between October 27 and November 5, 2007. Leach amenability studies are intended to demonstrate that the uranium mineralization is capable of being leached using conventional ISR chemistry. The leach solution is prepared using sodium bicarbonate as the source of the carbonate complexing agent (formation of uranyldicarbonate (UDC) or uranyltricarbonate ion (UTC). Hydrogen peroxide is added as the uranium oxidizing agent and the tests are conducted at ambient pressure. Sequential leach "bottle roll" tests were conducted on the two core composite intervals selected by Powertech personnel. The tests are not designed to approximate in-situ conditions (permeability, porosity and pressure) but are an indication of mineralization reaction rate and the potential for uranium recovery.

The leach tests were conducted on two core intervals recovered from two holes. One interval represented low-grade at 0.073% as U and the other interval represented higher-grade material averaging 0.116% as U. Based on the known volume of core in the selected intervals and the apparent wet density, wet masses of sample representing a 100ml pore volume (PV), assuming 30% porosity, were delivered to the reaction vessels. Five PV lixiviate charges (500mL of 2g/L HCO_3, 0.5g/L H_2O_2) were mixed with the mineralized samples and vessel rotation was started. Over a six day period, 30 PV of lixiviate was delivered to and extracted from the vessels. Analysis of the resulting leach solution indicated leach efficiencies of 71% and 95% [SRK revised these extraction efficiencies to 74% and 78% as described in Section 14.1.3).

These preliminary leach tests showed normal leach curves and indicated that the uranium deposits at Centennial appear to be readily mobilized in oxidizing solutions.

14.1.1 SRK Comments

SRK notes that the preliminary lab testing of porosity and leachability are favorable first steps in determining amenability of ISR methods of uranium recovery. Currently available pump test data suggest the potential for movement of fluids through the rocks in situ. Additional pump tests are necessary to determine aquifer drawdown and restoration criteria. These additional pumps test are planned by Powertech, and will provide additional information of the potential for ISR; however, SRK notes that only direct injection and recovery of lixiviant, and processing will provide direct information on the leachability rate, leach solution chemistry, and ultimate uranium recovery that can be expected.

This section includes reviews of the following topics:

- Uranium analysis of core samples;

- Bottle roll leaching tests;
- Pressurized leaching test; and
- Dissolved species and implications on process solution bleed.

14.1.2 Uranium Analysis of Core Samples

Chemical analyses for uranium were performed by ELI in Casper, WY. Core samples were dried and pulverized through 100-mesh, then subjected to closed-can gamma counting, as well as "chemical uranium" determination by strong mineral acid digestion and analysis of the resulting solutions by Inductively Coupled Argon Plasma (ICP) emission spectroscopy.

14.1.3 Bottle Roll Leaching Tests

Bottle roll leaching tests were carried out on core samples from Hole #IN-1C and Hole #IN-2C, respectively, representing lower-grade resource at 0.073% U (0.086% U_3O_8) and higher-grade resource at 0.116% U (0.137% U_3O_8). Assuming a porosity of 30%, a pore volume of 100mL was estimated for 333cm^3 of core. (According to the ELI procedure as provided to another of our clients, the core samples were pulverized through 60-mesh prior to head analysis and bottle roll leaching.)

The core composite samples were placed in 2-liter plastic bottles and leaching solution ("lixiviant") containing 2.0g/L HCO_3^- (as sodium bicarbonate) and 0.5g/L H_2O_2 (as aqueous hydrogen peroxide) was added at a liquid/solid ratio of five pore volumes (500mL for 333cm^3 of solid sample). The bottles were then rotated around their long axis for 16 hours at 30 RPM. Following the initial leaching cycle, the bottles were emptied and centrifuged and the solutions were analyzed for uranium, vanadium, sodium, sulfate, alkalinity (bicarbonate and carbonate), selenium, pH, and conductance. The solids were then returned to the bottles and 500mL of clean lixiviant was added. Over a six-day period, 30 estimated pore volumes of solution were added to and extracted from each bottle. The final solid residue was dried, ground, and analyzed for uranium to enable calculation of an overall mass balance.

The uranium extractions, reported on the basis of comparing the uranium contained in the leachate solutions with the total uranium as measured in the post-test ore assay, were 78% for #IN-1C and 74% for #IN-2C. Core Laboratories conducted various tests on Hole # IN-3C core, including porosity measurements ranging from 32.77 to 50.24%, and averaging 40.21%. If there was similar granulometry in Holes #IN-1C and #IN-2C, the assumed porosity was too low, resulting in underestimation of the pore volume; the effect of this error would be that the reported extractions were actually conducted with fewer than 30 pore volumes of lixiviant.

To quote the ELI report dated November 29, 2007, "The tests are not designed to approximate in situ conditions (permeability, porosity, pressure) but are an indication of the ore's reaction rate and the potential uranium recovery." It is sufficient to say that the bottle roll tests confirmed that the uranium mineralization in the core samples is amenable to dissolution at ambient conditions with oxygenated water containing a bicarbonate/carbonate complexing agent.

14.1.4 Pressurized Leaching Test

During December 2008, Hazen Research, Inc. (Hazen) performed a sealed bottle roll test using pressurized oxygen and carbon dioxide, rather than aqueous reagents, to simulate in-situ conditions near the bottom of a commercial injection well. The medium was natural ground

water and the sample was a composite from Hole #IN-3C. The test was interrupted periodically to separate the aqueous phase and to contact it with ion exchange resin to isolate uranium dicarbonate (or tricarbonate) and other anionic species before returning the solution to the pressure vessel for another leach cycle. Four 4-day to 5-day cycles were completed at partial pressures of 5 psi CO_2 and 95-98 psi O_2.

The composite was made up of splits from core intervals between 367 and 373ft below the collar of the hole. A weighted average of the assays of the eleven 0.5ft intervals was 1,040mg/kg U, or 1,226mg/kg (ppm) U_3O_8, based on analyses completed earlier by ELI. However, the blended composite was sampled twice prior to testing and the assays were 0.076% and 0.141% U_3O_8 versus the weighted average of 0.123% U_3O_8 based on ELI analyses. It is not clear why the analytical agreement was so poor, but there are several possible explanations: (1) the composite may not have been blended properly; or (2) sampling of the blended composite by Hazen may have been flawed, or (3) sensitivity to matrix effects may have introduced errors into ELI's ICP procedure, whereas Hazen's fluorometric determinations would not have been influenced.

The outcome of the pressurized bottle roll leach experiment is uncertain, especially as a result of the head assay question, but uranium extractions of 71 and 75%, respectively, can be inferred on the basis of residue and solution assays. The #IN-3C test was terminated after contact with 25 pore volumes and prior to cessation of leaching with the cumulative extraction still increasing.

14.1.5 Dissolved Species and Implications on the Process Solution Bleed

Final production composite solutions (CS) from the ambient and pressurized bottle roll tests contained only trace concentrations of molybdenum, selenium, and vanadium, indicating that bleeding solution for the sake of control of those impurities in yellowcake will not be necessary. However, total dissolved solids (TDS) increased from approximately 1,000mg/L in natural groundwater to about 3,340mg/L in the final CS, primarily reflecting increases in sodium, bicarbonate, and chloride ions. Also, radium increased from 20 pCi/l Ra^{226} to approximately 2,500 pCi/l Ra^{226} in the CS. Should impurities inhibit IX loading, Powertech will utilize the planned reverse osmosis (RO) circuit to perform a chemical bleed, reintroducing the RO permeate into the injection stream.