Introduction

The F/H Area Seepage Basins located in the center of Savannah River Site (SRS) (Figure 1) received approximately 1.8 billion gallons of acidic waste solutions. The acidic nature of the basin waste solutions triggered the mobilization of metals and radionuclides including soluble uranium (VI).

Figure 1. Aerial view of SRS

Results/Discussion

**Table 1.** Batch 2 sample compositions

<table>
<thead>
<tr>
<th>Description</th>
<th>Fe Concentration, ppm</th>
<th>Description</th>
<th>Fe Concentration, ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batch 1, Sample 1</td>
<td>4505.875</td>
<td>Batch 1, Sample 5</td>
<td>6958.568</td>
</tr>
<tr>
<td>Batch 1, Sample 2</td>
<td>13311.8</td>
<td>Batch 1, Sample 6</td>
<td>6490.83</td>
</tr>
<tr>
<td>Batch 1, Sample 3</td>
<td>862.125</td>
<td>Batch 1, Sample 7</td>
<td>1185.962</td>
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<td>Batch 1, Sample 4</td>
<td>7056.947</td>
<td>Batch 1, Sample 8</td>
<td>7566.702</td>
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<td>Batch 2, Sample 1</td>
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<td>Batch 2, Sample 2</td>
<td>8613.304</td>
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<td>Batch 2, Sample 3</td>
<td>9786.373</td>
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<tr>
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<td>1730.327</td>
<td>Batch 2, Sample 4</td>
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<tr>
<td>Batch 2, Sample 4</td>
<td>4343.23</td>
<td>Batch 2, Sample 5</td>
<td>-</td>
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<tr>
<td>Batch 2, Sample 5</td>
<td>-</td>
<td>Batch 2, Sample 6</td>
<td>-</td>
</tr>
</tbody>
</table>

**Figure 26.** Set 1 vs. Siderite and Pyrite

**Figure 27.** Set 2 vs. Siderite and Pyrite

**Figure 28.** Set 3 vs. Siderite and Pyrite

**Figure 29.** Set 4 vs. Siderite and Pyrite

**Figure 30.** Graph of pH evolution study of Batch 2

**Figure 31.** ICP-OES data

**Figure 32.** Set 5 XRD results vs Siderite and Pyrite

**Figure 33.** Set 6 XRD results vs Siderite and Pyrite

**Figure 34.** Set 7 XRD results vs Siderite and Pyrite

**Figure 35.** Set 8 XRD results vs Siderite and Pyrite

**Figure 36.** Set 9 XRD results vs Siderite and Pyrite

**Figure 37.** Set 10 XRD results vs Siderite and Pyrite

**Figure 38.** Set 11 XRD results vs Siderite and Pyrite

**Figure 39.** Set 12 XRD results vs Siderite and Pyrite

Future Work

- Conduct ICP analysis on the Batch 2 samples using a lower dilution factor.
- Determine the types of reactions that might occur in the anaerobic aquifer.
- Verify the continued sequestration of U(VI) in relation to the possible re-oxidation of minerals from the bioreduction zone.
- Sulfate concentrations will be examined using an ion analysis technique.
- Determine pH levels, sulfate concentrations, and iron concentrations after re-oxygenation.

Acknowledgements

- Dr. Velena Katsenovich
- Dr. Leonel Lagos
- Dr. Miles Denham
- DOE-FLU Science and Technology Workforce Development Program
- This research is supported by the U.S. Department of Energy, Office of Environmental Management, Office of Science and Technology