

MICROBIAL REDUCTION OF URANIUM IN MINE LEACHATE BY FERMENTATIVE AND IRON-REDUCING BACTERIA¹

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Abstract. Our hypothesis is that fermentative- and iron-reducing microbial activity in a permeable reactive barrier (PRB) intercepting U(VI)-laden leachate will result in a U(IV) precipitate. The project is composed of two connected phases: 1) batch studies; and 2) column studies. Batch studies are being used to optimize the reductive process and promote synergistic reduction of U by fermentative and iron-reductive microbial processes with efficient utilization of a carbon substrate. Microorganisms include *Clostridium* sp. and *Shewanella putrefaciens*. Carbon sources include glucose and cellobiose for Clostridia and acetate for *S. putrefaciens*. Column experiments will be used to evaluate the U(VI) bioreduction process under flow conditions. Both batch and column experiments will consider bioreduction of U(VI) that is complexed to inorganic (i.e., carbonate) and organic (i.e., citrate and fulvate) ligands.

Additional Key Words: bioreduction, remediation, permeable reactive barriers

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