

DIRECTOR'S COMMENTS

G—045-01

Conceptual Design for Chlor-alkali and Valuable Materials Production from Oilfield Brine

Submitted by: Barr Engineering Co.

Principal Investigator: Dr. Scott F. Korom

Request for: \$110,000

Total Project Costs \$220,000

Duration: 12 months

Description of the Project:

This project will develop a preliminary base plant design, products list, and economic assessment for a near-term commercial facility that produces at least 1 million gallons per week of 35% hydrochloric acid solution along with a corresponding amount of caustic soda. The process will be designed in a modular way such that its capacity can be scaled up later to produce additional materials from brine. Module additions would be a future retrofit, if deemed economically beneficial. Finally, this project will also evaluate the feasibility of recovering other high-value materials, such as lithium, magnesium, rare earth elements, iodine, potassium, and bromine from the brines. The outcome will propose a vetted technology such that investment marketing and establishment of a commercial facility can commence relatively quickly. This is a low risk project that could provide an outsized economic return to the State of North Dakota.

Barr Engineering Co. (Barr) will be the lead organization for this project. The University of North Dakota Institute for Energy Studies (UND IES) and Triple 8 LLC will partner with Barr, the former will provide process modeling and laboratory analysis to support the process design, and the latter is the private business interested in commercializing the proposed technology, will provide matching funds and in-kind support. OneCor Services LLC supports this initiative and would utilize the local supply of HCl.

Technical Reviewers' Comments

Reviewer G-45-01A

It would have been nice to see how this project would be developed on a large full production scale. In the end, this project has a potential to increase a benefit from of a waste stream and make it profitable while having the possibility of lessening environmental impacts. **Recommendation: Fund**

Reviewer G-45-01B

The project is too focused on the technical (treatment) aspects of the concept. A thorough feasibility study would concurrently evaluate legal and logistical hurdles.

Recommendation: Do not fund

Reviewer G-45-01C

The project upside is significant for the state of North Dakota for recycling brine. Prior to committing this large amount of dollars to this effort, can Barr or Triple 8 conduct multiple studies on a number of SWD disposal wells to determine what solids are suspended in the produced water. Nearly all solids are dropped out in the form of tanks bottoms at SWD wells. Those bottoms could be analyzed/characterized for recoverable materials in a dedicated lab. If recoverable materials are present, than move forward with the proposal as it is written. **Recommendation: Consider Funding**

Director's Recommendation:

To consider funding in the amount of \$110,000.