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**Progress Report**

PROJECT TITLE: Recycling Nitrate With Electrodialysis (3 mo. Extension of previous project)

PROJECT NUMBER: 4097-13SP

REPORTING PERIOD: 10/012016 – 01/31/2017

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1.) PROJECT ACTIVITIES COMPLETED DURING THE REPORTING PERIOD. (*Describe project progress specific to goals, objectives, and deliverables identified in the project workplan.*)

We conducted a field test of a new system to remove nitrate from stream water and concentrate it for reuse. It was conducted on Trout Brook, a highly contaminated stream in southern Dakota County. The solar-powered system was successfully operated over a two week period.

2.) IDENTIFY ANY SIGNIFICANT FINDINGS AND RESULTS OF THE PROJECT TO DATE.

We proved that the idea works. Stream water that contained 20-25 ppm nitrate was pumped through the electrodialyzer and returned to the stream with a concentration below 10 ppm, and the extracted nitrate was concentrated in a tank for fertigation. The tank concentration exceeded 500 ppm by the conclusion of the test. The system was run solely on a bank of marine batteries, charged by solar panels.

3.) CHALLENGES ENCOUNTERED. (*Describe any challenges that you encountered related to project progress specific to goals, objectives, and deliverables identified in the project workplan.*)

A number of challenges were encountered that will be addressed in subsequent designs. Filtration of sediment at the stream intake was the primary problem. The other was precipitation of calcium carbonate (scaling) in the system.

4.) FINANCIAL INFORMATION (*Describe any budget challenges and provide specific reasons for deviations from the projected project spending.*)

None

5.) EDUCATION AND OUTREACH ACTIVITES. *(Describe any conferences, workshops, field days, etc attended, number of contacts at each event, and/or publications developed to disseminate project results.)*

*Results were presented in an invited talk at the Annual Meeting of the American Society of Agronomy in Phoenix AZ. They will also be presented in a seminar to the University of Minnesota Water rfesources Program.*