Advances In Impacts Recovery From Electrokinetic Soil Remediation

Submitted by:

Stealth Energy Group, LLC., NDSU, EOG, Oasis

- **Total Funding Request - $265,000**
  Total Project Costs - $547,660
  Project Duration: 2 years

Project Description

The objective of this project is to enhance the recovery of mobilized ions such as sodium and chloride during electrokinetic (EK) remediation, through groundwater recovery well design. A secondary objective is the use of sub-irrigation to decrease remediation duration and to potentially expand locations where this remediation technology may be applied. A third objective is to make the learnings about this technology available to interested operators, landowners, and consultants using NDSU Extension, and operator roundtables. This objective is expected to encourage the use of this technology to responsibly remediate brine impacted soil.

Based on laboratory and field studies, removal of chloride and free sodium to near background concentrations is possible. The applicant expects increasing the well size with a sand pack development will enhance ion recovery. These recovery improvements coupled with irrigation should decrease remediation time from decades long to years or even months making this a cost-effective remediation tool. If successful, use of irrigation could greatly broaden the opportunities for application of the EK technology to soils in nonwetland environments such as croplands, rangelands, and native areas

TECHNICAL REVIEWERS' RATING SUMMARY

		Technical Reviewer			
Statement	**Weighting Factor**	**G-55-05A**	**G-55-05B**	**G-55-05C**	**Average Weighted Score**
Objectives	**9**	4	5	4	36
Achievability	**7**	4	4	2	21
Methodology	**8**	4	4	4	32
Contribution	**8**	4	4	2	24
Awareness / Background	**5**	5	2	4	15
Project Management	**3**	4	3	2	9
Equipment / Facilities	**2**	4	4	4	8
Value / Industry-Budget	**4**	4	4	3	12
Financial Match – Budget	**4**	4	5	3	16
Average Weighted Score		205	200	156	187
Maximum Weighted Score				**250 possible points**	

Technical Reviewer Totals

- G-55-05A

Average Weighted Score: **205 out of 250**

FUND

- G-55-05B

Average Weighted Score: **200 out of 250**

FUND

- G-55-05C

Average Weighted Score: **156 out of 250**

FUNDING TO BE CONSIDERED

Technical Reviewer Comments

Reviewer G-55-05A

I would highly recommend approving this project. If the proposal has the outcome that is predicted it will add a much-needed tool for a more cost effective clean up tool and one that will be minimally invasive on the land. The time to complete the project is also a benefit to the EK process.

Recommendation: FUND

Reviewer G-55-05B

The results of this project will further propel methods of saltwater remediation beyond scoop and haul, followed by bringing in replacement soils. Landowners have complained about scoop, haul and replacement methods due to introduction of new weeds and the soil having different characteristics from the surrounding soil. EK remediation would eliminate this practice and provide a true means of soil restoration. Obviously, the kinks to be worked out are indicated within the application: irrigation assist, and areas around the wells becoming full of ions that should have entered the wells to be removed. However, the benefits outweigh the costs involved and can certainly lead to a better understanding in the development of successful EK remediation systems.

Recommendation: FUND

Reviewer G-55-05C

While the use of EK has been extensively researched for decades, it remains an esoteric technology that is not widely utilized. This reviewer is skeptical that this effort will somehow catalyze its widespread adoption

Recommendation: FUNDING TO BE CONSIDERED

Director's Recommendation:

Fund in the amount of $265,000.