Abstract

Brine water contamination alters soil chemistry, soil structure, and infiltration rates in West Texas. Brine contamination results in lower infiltration rates due to destruction of soil structure. This study was conducted on a 14-acre brine spill “kill zone” site located approximately 14 km south of San Angelo, Texas. In the Spring of 2016, rips to a depth of approximately 50 cm were put in place along with furrows to a depth of 15 cm. The rips and furrows were implemented on the brine affected site to loosen the soil structure, increase infiltration rates, and allow for remediation of the site through in-situ bioremediation. Infiltration measurements were obtained using a double-ring infiltrometer to determine if implementing rips and/or furrows allowed for higher infiltration. Preliminary infiltration tests were conducted on rips, furrows, and at randomly chosen unworked locations. From this data, average infiltration rates for the rips were 5.9 cm/hr, the furrows were 2.4 cm/hr, and the control sites were 1.9 cm/hr, indicating ripping the soil appears to be the best form of remediation. Infiltration tests have been conducted during sustained rain fall to observe what naturally occurs and exhibits a diurnal flux in temperature as water infiltrates. Two Hobo U-23 sensors are placed on a rip at 2.5 cm and 10 cm in the ground where temperature stays 2-3 degrees apart. However, when water infiltrates the system, the temperature of both sensors equilibrates. Further studies will analyze the correlation of infiltration to temperature.
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Tasks and Objectives
- Infiltration study on rips, furrows, and random locations using double ring infiltrometer built to ASTM Standard D 3385-94.
- Hobo U-23 is placed on rip, furrow, or random location during each infiltration study to track temperature fluctuations.

Objectives
- Determine whether ripping or furrowing is a viable method of bioremediation.
- Find the correlation between infiltration rates and temperature as a function of time.

Conclusions and Future Work

Conclusions
- Infiltration rates increased due to ripping and decreased due to furrowing.
- Temperature increased on ripped soil and decreased on furrowed soil.

Future Work
- Further studies are being conducted to determine a correlation between infiltration rates and temperature.
- Data will be presented at future conferences.

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