

Halophyte Remediation of Brine-Impacted Oil and Gas Sites in Kansas

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In the Midcontinent, historical oil-producing practices have been responsible for patches of bare, sterile soil that cannot support crops or indigenous weeds. Such land may be severely eroded. Usual practice has involved excavation of impacted soil and removal to a public landfill site. "Dig and haul" activity is expensive and is not sustainable in the long run; there are too many brine-impacted sites.

Brine-impacted soil can be remediated in situ by calcium substitution for sodium in the clay mineral matrix. Gypsum is applied to the surface, causing sodium to leach into deeper strata below the root zone. However, brine-impacted soils also have low permeability. Remediation can be enhanced by planting salt-tolerant species (halophytes) that increase vertical permeability by rooting action and actually draw salt out of the root zone and fix it in their leaves and stems.

CH2M HILL is teaming with the Kansas Corporation Commission and the Kansas Biological Survey to remediate an orphan water-flood site. The Leon oil field covered approximately 400 acres in southwestern Butler County and operated for many years under primary production and water flood. The field has approximately 8 acres sterilized by spills of brine as well as tank bottoms. The impacted areas are being treated with several halophyte cultivars and soil additives. By the end of the growing season, the Kansas Corporation Commission will have determined which halophytes are best suited to conditions in Kansas and will distribute a handbook for best management practices in remediating brine-impacted soil.