

Updates and Upgrades to Alberta Environment Subsoil Salinity Tool (SST) Software and Manual

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Previous and current research projects performed by Equilibrium Environmental in conjunction with PTAC, PERD, AUPRF, Alberta Environment, and industry in-kind funding have generated the current version of the Subsoil Salinity Tool (SST). This project proposes to update and upgrade numerous aspects of the SST, with many of these changes driven by feedback from users, course attendees, and government regulators. These upgrades for chloride include the addition of smoothing functions for DUA and aquatic life guidelines, both of which allow for more refined guidelines reflective of measured site conditions which are less sensitive to input parameters crossing various thresholds. It also includes the addition of Buffer Allocation Factors (BAF's), a recently approved approach by Alberta Environment which allows for more refined guidelines for sites with multiple subareas. There is also the potential for an alternate aquatic life guideline for prairie sloughs/wetlands, which

should be greater than the recently-updated CCME guideline of 120 mg/L chloride. The upgraded SST will also have the ability to generate subsoil SAR and sulfate guidelines, with several of these chloride updates/upgrades also applicable to sulfate and/or SAR. For example, the BAF upgrade for chloride could also be extended to sulfate to allow for multiple subareas of sulfate impacts. The DUA and aquatic life smoothing functions could also be applied to subsoil sulfate guidelines. The addition of a SAR irrigation pathway and upward migration pathway are also proposed upgrades, both of which are recently identified pathways discussed in recent and ongoing meetings of the PTAC Salinity Working Group.

Salinity impacts have the largest total foot-print and potential environmental liability of all oil and gas-related impacts to soil and groundwater. The Subsoil Salinity Tool currently provides benefit to oil and gas companies, environmental consultants, government environmental agencies, and landowners due to the ability to provide standardized assessment and remediation of the chloride aspect of salinity impacts. The SST has streamlined and standardized the analysis, remediation, and regulatory review of numerous sites since its introduction, and over a hundred environmental practitioners, provincial regulators, and industry representatives have successfully taken the certification course and exam. These benefits will be further enhanced by the addition of the Buffer Allocation Factors which will

allow more refined remedial guidelines and cost savings for sites with multiple subareas. The additional smoothing of the DUA and aquatic life guidelines will also provide cost benefits through more refined guidelines reflective of measured site conditions. Expanding these smoothing functions and BAF factors to subsoil sulfate will enhance these benefits, as will incorporating the recently-identified subsoil SAR pathways of irrigation watering and upward migration. Updates to the SST manual and imbedded help file, including numerous additional clarifying examples, will provide salinity training benefits to a wide range of users and help standardize assessments. Overall, these upgrades and updates will result in additional savings to industry in terms of site investigation costs, risk assessments costs, and remediation costs. The ability to more accurately estimate environmental liability will also be increased, as will environmental performance in general.

Contact PTAC or Equilibrium to obtain copy of SST Software, Version 2.5.3

2013 EQM_Subsoil_Salinity_Tool_2 5 3_Help_File_Final

2014 EQM_SST Help File_2 5 3_Final Part 1

2014 EQM_SST Help File_2 5 3_Final Part 2