

SPOIL SODICITY STANDARDS: RECONCILING SCIENCE AND REGULATION

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Sodicity is an important determinant of soil and spoil suitability for mined land reclamation. High levels of exchangeable sodium may cause soil physical degradation and a reduction in the rate of water and air transmission. Productivity losses associated with sodic surface soils are well documented in agricultural soils. State and Federal spoil suitability guidelines for sodicity were originally developed in the late-1970's from agricultural standards (i.e., Handbook 60; SAR =13) and modified for the purposes of SMCRA. More recent agricultural standards (late-1980's) recognize that relatively high levels of sodicity (e.g., SAR=40) are tolerable in the lower root zone. The new agricultural standards are conditional, and incorporate the full range of factors that affect the severity of the structural degradation process in determining tolerable sodicity levels. Specifically, prudent sodicity hazard assessments must consider soil texture, salinity, mineralogy, pH, soil-water content, precipitation regime, and plant selection. In general, sodicity hazards are reduced in materials with low pH's, high salinity, non-expanding clay minerals, coarse textures, readily weatherable minerals, low water application rates, and unsaturated flow regimes. These conditions characterize the spoils from many western coal-producing regions suggesting that higher levels of sodicity may be tolerable. The divergence among the modern agricultural and mine reclamation standards suggest that a reevaluation of the sodicity standards is justified, especially in light of the economic burdens associated with sodic spoil mitigation. We will present a comprehensive method for the assessment of spoil sodicity hazards that includes both short- and long-term considerations.

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