

**DEPARTMENT OF MINES, MINERALS AND ENERGY
DIVISION OF MINED LAND RECLAMATION**

**DMLR's Approach to Assessing Reasonable Potential for Total
Dissolved Solids (TDS) under Virginia's Narrative Standard**

This document explains the Department of Mines, Minerals and Energy's Division of Mined Land Reclamation's (DMLR) method for determining whether a coal surface mining operation's National Pollution Discharge Elimination System (NPDES) discharge exhibits a reasonable potential to contravene the narrative water quality standards set forth in [9VAC 25-260-20A](#) with respect to Total Dissolved Solids (TDS).

DMLR will conduct reasonable potential analyses utilizing a method that is consistent with the Virginia Department of Environmental Quality's (DEQ) methods. DMLR will first examine effluent flow data to determine if additional analysis is necessary. If so, then TDS data will be used for screening purposes to determine if a particular discharge, after assimilation into the receiving water body (i.e., mixing), may exhibit reasonable potential to exceed existing water quality standards. If so, then additional Whole Effluent Toxicity (WET) analyses of the effluent will be required. DMLR will use the following analysis to determine if a discharge has a reasonable potential to contravene the applicable narrative water quality standards and thus require WET testing.

The reasonable potential analysis procedure, presented graphically in the attached flowchart, will determine permit conditions needed for new permits, permit renewals, and NPDES modifications. This analysis will include the potential for the permit's sediment control structures to discharge, and whether dilution is available in the receiving streams.

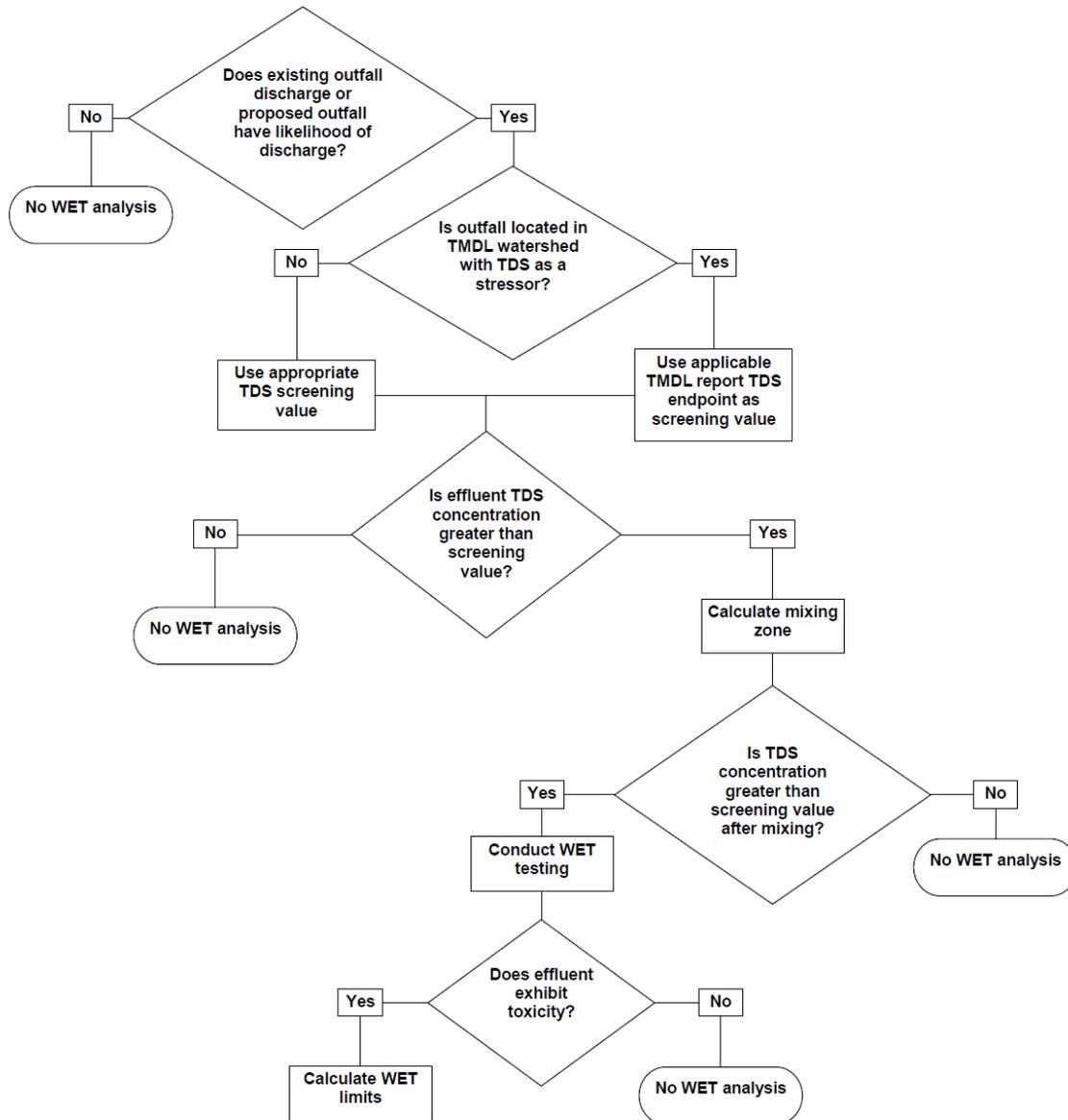
NPDES outfalls receiving only stormwater in contact with industrial materials that have not discharged during the previous 2 ½ years, as well as outfalls where low discharge frequency, volume, and concentration render the outfall to be inconsequential to the receiving stream quality, do not have a reasonable potential to contravene the narrative standard with respect to TDS. This exclusion only applies to precipitation driven discharges.

For discharges that have a history of flow for the past 2 ½ years, appropriate screening values will be utilized in the reasonable potential analysis in a manner similar to the way mixing zones are calculated for pollutants with numeric standards. In TMDL watersheds where TDS is a stressor, DMLR will utilize the modeled TDS endpoint values presented in the appropriate TMDL report. DMLR will also utilize an appropriate value for non TMDL watersheds and TMDL watersheds where TDS is not a stressor. Initially, those NPDES discharges not located in TMDL watersheds with TDS as a stressor will have reasonable potential determined using a screening value of 422 mg/L as reported in the Virginia Tech study titled "[Levels of Dissolved Solids Associated with Aquatic Life Effects in Headwater Streams of Virginia's Central Appalachian Coalfield Region](#)" dated April 2011. The screening value may be adjusted in the future as additional research and monitoring data becomes available to DMLR.

The applicable screening values will be utilized to calculate whether a discharge, after mixing, will result in an in-stream concentration greater than that screening value. WET analyses will be required if mixing calculations indicate that the in-stream TDS concentration would exceed the screening value after mixing. In the case where both ambient in-stream and effluent concentrations are greater than the screening value and the effluent concentration is less than the in-stream concentration prior to mixing, WET testing will be required.

The need for WET limits will be determined based on the results of those analyses, any toxicity reduction efforts that are implemented, and the toxicity of the effluent, taking into account applicable mixing zones. DMLR will consider design controls for toxicity, TDS and/or flow that reduce a discharge's potential to cause or contribute to an excursion of the narrative water quality standard.

TDS Reasonable Potential Procedure Flowchart



Note: The appropriate screening value for non-TMDL watersheds and TMDL watersheds where TDS is not a stressor will initially be 422 mg/L referenced from the Virginia Tech study on Virginia coalfield streams titled "[Levels of Dissolved Solids Associated with Aquatic Life Effects in Headwater Streams of Virginia's Central Appalachian Coalfield Region](#)" dated April 2011.