

Impact of Priority Substances Daughter and Marine Strategy Directives on Sediment Management: Setting the Bar High in Difficult Economic Times

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Introduction: The Water Framework Directive (WFD) requires that all European Union waters achieve good ecological status by 2015. The WFD has prompted considerable investment in the preparation of River Basin Management Plans. The Priority Substances Daughter Directive (PSDD; proposal adopted 17 July 2006) [1] will add considerable complications to the WFD and to the scope of sediment management in RBMPs, more so than the likely impact of the Marine Strategy Framework Directive (MSFD) (adopted July 2008) [2].

The PSDD requires prevention and control of chemical pollution of surface waters - setting limits on concentrations of 41 chemical substances (including 33 priority substances and 8 other pollutants) that may pose a particular risk to the aquatic environment and to human health. For certain substances which are particularly bioaccumulative such as hexachlorobenzene, hexachlorobutadiene and methylmercury, the PSDD will specify additional concentration limits to protect aquatic organisms; decisions on other substances that may be included in the PSDD are still under review or await the outcomes of risk assessments.

The aim of the MSFD is to protect the marine environment across Europe. The directive specifies achieving good environmental status in EU marine waters by 2021 and protection of resources considered important to the marine-related economy.

Impact on European Industry:

The 11 criteria of 'good environmental status' specified in the MFD and the environmental quality limits specified in the PSDD have immediate impacts on the scope of sediment management included in RBMPs. Source control, a key foundation in U.S. sediment management strategy [3], will become of paramount importance to achieve the target dates set in the directives. Can cost-effective pollution prevention be implemented in an industrial setting?

The effects will likely be felt by any industry that discharges effluent to European waterways. Detailed engineering process reviews and associated high costs for process refinements will likely become necessary for any industry discharging listed chemical substances into waters. This includes

agriculture, water utilities, wastewater facilities, power plants, municipal waste disposal and recyclers, pharmaceutical, mining, and a wide range of manufacturing industries involving processes that release substances into waters.

The Societal Cost Benefit Analysis (SCBA) derived by SedNet may significantly misdirect the limited investments available to handle sediment quantities or control pollutant sources prior to accumulation in sediments, both of which require actions to preserve or protect the quality of sediment necessary to achieve the 'good status' criteria set out in the directives [4].

Perhaps more importantly, the cost to the European economy will be significant; regrettably at a time when industry throughout Europe cannot afford the necessary engineering and environmental studies to meet PSDD and MSFD requirements. This includes industries involved in so-called "green technologies" targeted for investments in various Member State economic stimulus packages.

Impact on Sediment Management:

For the PSDD to achieve any measureable success by the target 2015 and 2021 dates set in the WFD and MSFD, the following needs to happen at a minimum: (1) Compilation of large scale sediment quality survey data; (2) geospatial maps that identify sediments areas where listed substances exceed specified limits; (3) well developed hydrodynamic and sediment transport models capable of tracking industry discharges from point releases in the aquatic environment; (4) sediment-to-fish bioaccumulation models capable of linking point releases to tissue residues, also distinguishing from background conditions; (5) paradigms similar to the U.S. total maximum daily load (TMDL) approach to specify tolerable discharge limits for different industries.

References:

[1] See www.ec.europa.eu/environment/water/water-dangersub/pri_substances.htm; [2] See www.ec.europa.eu/environment/water/marine/index_en.htm; [3] See www.epa.gov/waterscience/cs/stratndx.htm; [4] Societal Cost Benefit Analysis and Sediments, SedNet Work Package 1 & 2: Workshop 4, Poland, 2004.