USE OF SEDIMENT QUALITY GUIDELINES IN A SEDIMENT ASSESSMENT

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1. Purpose: The purpose of this paper is to describe the appropriate technical use of sediment quality guidelines (SQG) for use in assessing the potential ecological risk of contaminants in sediments. The SQG values should be used in a consistent manner regardless of the programmatic and regulatory requirements. The appropriate use and limitations of SQG values are described here:

2. Appropriate Use of Sediment Quality Guideline Values: Sediment quality guidelines can be used as a simple first screen of potential hazards to benthos using the chemical analysis of sediments. SQG values can be used to:

- Identify the needs for additional benthic evaluations
- Determine that a sediment is not likely to cause effects to benthos
- Focus the scope of additional study (e.g., reduce number of contaminants of concern or pathways to be considered in baseline assessment)
- SQG values may be used in a weight-of-evidence approach with other data (benthic toxicity, biological indices, tissue residues, effects data)

3. Limitations of Sediment Quality Guideline Values: Sediment quality guidelines have several limitations in their use. The SQG values do not provide estimates of risk. There are many reasons they do not adequately consider risk including:

- Some pathways not considered (bioaccumulation and trophic transfer)
- SQG values do not address more than one chemical or their interactions
- Screening with SQG does not address or quantify exposure
- SQG values are not site specific
- Biological availability is not quantified

Furthermore, it has been demonstrated the rate of false positives and false negatives in the application of SQG values are high. A study by O'Connor et al. (1998) reported that of 239 samples that exceeded at least one ERM, only 38% were toxic to amphipods. In an additional study by Long et al. (1998), the probability of toxicity below the ERL was as high as 10%. Because of these limitations, SQG values should not be used as a remediation goal, to predict biological effects, or to estimate of human or ecological risk. The U.S. EPA Superfund Office has the same technical position with regard to the use of SQG values for remediation goals.

4. Additional Information: The above briefly describes the correct use and limitations of SQG values. Additional information can be found in the attached references. Included in these references is the U.S. Army Corps of Engineers position on the use of SQG values in the management of dredged materials. This position was based on the appropriate scientific and technical application of SQG values. Recently, the Society of Environmental Toxicology and Chemistry (SETAC) sponsored a Pellston workshop held on August 17-22, 2002. This workshop addressed the basis for SQG values, appropriate application in sediment assessments, and other approaches to assess sediments.

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