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Draft Final Summary Scope of Work
Estimation of Sediment Stabilities, Contaminant Volumes, and Comparative Risks
Centredale Manor Restoration Project (North Providence, Rhode Island)
15 July 2002

This summary scope of work describes tasks associated with sediment core sampling and analyses for chemistry and physics on the Woonasquatucket River (Allendale and Lyman Mill Ponds -impoundments-) to address OSWER Directive 9285.6-08; and estimate: volumes of contaminated sediment, rates of sediment particle deposition or erosion, and comparative risk of remedial options in the near-term (e.g., excavation, capping) compared to remedy effectiveness of less invasive action (e.g., monitored natural recovery) in the long-term.

Objective 1: To construct vertical profiles of sediment contamination and deposition back in time to sediment depths before site activities began, and in areas necessary to adequately represent each pond.

Task 1 - Investigate river geomorphology (characterize channel geometry, hydraulic regimes, fluvial processes, etc.), collect field data on vertical density (e.g., ground penetrating radar, side-scan sonar), bathymetry (e.g., depth finder), identify "top-of-sediment" elevation by density (e.g., manual sounding using settlement plate), and station position (e.g., triangulation, lat-long by GPS). Develop new data into existing GIS database and map the results. Assume RI characterization represents current conditions.

Task 2 - In the field for each sediment core (e.g., Vibracore), record appearance, odor and identify "top-of-sediment" (e.g., Munsell color chart, "boring log" type description, video tape). In the lab the same day, section cores at $\geq$0.5-cm increments (horizontal) from "top-of-sediment", and sample for chemistry (e.g., HCX, TCDD, organic carbon, CEC) and physics (e.g., grain size distribution, cohesiveness, and radiometric dating using ^{137}Cs, ^{210}Pb, ^{7}Be).

Task 3 - Analyze each sectioned core to delineate horizons and age of particle deposition within reconstructed cores by pond by comparing HCX or TCDD and isotope activity to % organic carbon and grain size at increments below the top-of-sediment.

Task 4 - Estimate volumes of contaminated sediment in each pond using kriging or other method.

Task 5 - Estimate rates of sediment particle deposition in each pond using vertical profile data (e.g., radiometric signature, HCX as marker), and determine if natural recovery is detected in Allendale Pond post dam construction.

Objective 2: To estimate likelihood of seasonal hydraulic or meteorologic disruptive forces, and their potential to alter sediment stability and particle deposition or erosion.

Task 6 - Choose sediment stability model (quantitative or qualitative), input field and lab data, and estimate particle deposition or erosion for various hydraulic regimes and magnitude disruptive forces in current and future scenarios in the presence and absence of site remediation.

Objective 3: To estimate comparative risks associated with remedial options for the purpose of informing remedial decision making and risk management strategies.

Task 7 - Compare costs and risks of active (excavation and capping) v. passive (MNR) remediation, of trucking and landfilling TCDD contaminated sediment v. leaving in-place, and estimate which alternative(s) result(s) in a net risk reduction.

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