Summary Guidance for Reviewing Sediment Sampling Plans for Dredging Projects

1. **APPLICABILITY.** This Standard Operating Procedure (SOP) applies to the Water Quality Certification Program, the Groundwater Certification Program and the Dredging Program. This Procedure is intended to assist the RIDEM, CRMC, and Applicant with the proper design and testing of sediment in accordance with Rule 7 of the Dredging Regulations.

   The applicable regulations are: State of Rhode Island Water Quality Regulations: Authority: Chapter 42-35 pursuant to Chapters 46-12 and 42-17.1 of the Rhode Island General Laws of 1956, as amended; State of Rhode Island Rules and Regulations for Dredging and the Management of Dredged Material, Regulation # DEM-OWR-DR-02-03: Authority: Marine Infrastructure Maintenance Act of 1996, the Marine Waterways and Boating Facilities Act of 2001, R.I. General Laws Chapter 46-1; and the State of Rhode Island Rules and Regulations for Groundwater Quality: Authority: Chapter 42-35 pursuant to Chapters 46-12, 46-13.1, 23-18.9, 23-19.1, 42-17.1, of the Rhode Island General Laws of 1956, as amended.

2. **PURPOSE.** To establish standardized methods and standards for DEM staff to follow when assessing the completeness and adequacy of an applicant's proposed sediment sampling protocol. The sediment sampling protocol is the precursor step to an applicant taking sediment samples for the purpose of applying for and marine dredge permit. The sediment sampling protocol is a Department requirement with the purpose of securing assurance that sediment sampling is performed in such a way as to result in compliance with applicable state and federal regulation and mandates. Establishing standardized methods for performing common repetitive tasks improves the DEM's communication with the public and CRMC as well as improving our efficiency, consistency, verifiability, credibility, and our ability to attain the highest levels of Quality Assurance, Quality Control, and Quality Improvement (QA/QC/QI). RIDEM has shared responsibility with the CRMC and within RIDEM there is shared responsibility between DEM Fish and Wildlife, Water Quality Certification, Groundwater Certification, and the Dredge Program. Standardizing the procedures and the requirements for the methods, are essential to the efficiency of the program.

3. **DEFINITIONS.**

   Applicant - The entity(ies) proposing a dredge/disposal activity that requires Departmental approval under one or more of the applicable Rules and Regulations cited above.

   CAD Cap – The approximate top two feet within the sediment of any of the eight Confined Aquatic Disposal (CAD) cells created for dredge disposal for the U.S.

Army Corps of Engineers Federal Dredge Navigation Project of the Providence River.

Data Plan Review – A technical review performed to compare sampling plan and detection limits with established quality criteria to ensure that data will be adequate for the intended use. Sampling Plan Approval confirms that the plan provides the highest overall quality requirements of the intended use. The submitted sediment sampling protocol must propose the appropriate suite of chemical and physical parameters that will adequately characterize the sediment proposed for dredging and disposal.

Detection Limit (DL)/Method Detection Limit (MDL) – the lowest concentration of a substance that can be measured with 99% confidence that the substance is present in the sample, i.e., greater than zero. Detection limits refer to a minimum concentration of an analyte that can be measured above the instrument background noise. Thus, when detection limits are used as reporting limits, the laboratory is saying that the analyte is not present at or above the value given. It may be present at a lower concentration, but cannot be "seen" by the instrument.

Dredged Material - Material excavated from the marine waters of the state, including rock, gravel, sand, clay, silt, mud, organic material, and material discarded by humans.

Habitat – Specific type of place within an ecosystem occupied by an organism, population, or community that contains both living and nonliving components with specific biological, chemical, and physical characteristics including the basic life requirements of food, water and cover or shelter.

Inland Testing Manual – The Inland Testing Manual (ITM) contains up-to-date procedures to implement requirements in the Clean Water Act (CWA) Section 404(b)(1) Guidelines for evaluation of potential contaminant-related impacts associated with the discharge of dredged material in fresh, estuarine, and saline (near-coastal) waters. Formally titled "Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. - Testing Manual," it was prepared by a joint Environmental Protection Agency/Corps of Engineers (EPA/CE) Workgroup. In 1991, EPA and CE revised an Ocean Testing Manual ("Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Manual") for evaluation of potential contaminant-related impacts associated with the discharge of dredged material in the ocean, under the Marine Protection Research and Sanctuaries Act (MPRSA). The ITM is patterned after this manual.

Maintenance Dredging - Dredging an area within state waters to restore channels and basins to previously authorized dimensions.

Minimum Reporting Limit (MRL) / Quantitation Limit (QL)–refers to a minimum concentration of an analyte that can be measured within specified limits of precision and accuracy. They are generally 5-10 times the detection limit.

Thus, when quantitation limits are used as reporting limits, the laboratory is saying that the analyte is not present in a sufficient amount to be reliably quantified (i.e., at a concentration above the quantitation limit). It may be present and even positively identified or "seen" at a lower concentration. The lowest concentration of a substance that can be reliably measured and reported with some degree of confidence.

New Dredging – Dredging an area within state waters that has never been dredged previously and /or dredging an area within state waters to dimensions not previously authorized.

Sampling Protocol – An applicant's proposed plan for both the collection of sediment samples and the identification of the proposed parameters.

Sediment – The sand, silt, and clay components of a marine substrate located below the mean high water elevation as identified on a site plan.

SOP – Standard Operating Procedure: The description of prescribed methods that must be used by DEM staff to assess the completeness of a sediment sampling protocol submitted by the applicant.

4. RESPONSIBILITIES.

The Water Quality Certification (WQC) technical staff is responsible for the analysis of a sediment sampling protocol submitted to the Department. The WQC technical staff must be familiar with the requirements set forth in each of the Rules and Regulations cited above for the purpose of assessing the protocol's completeness in terms of compliance with each Rule and Regulation cited above. The WQC staff is responsible for coordinating with other state and federal agencies, including but not limited to the State Dredge Coordinator, and for communicating to the applicant any deficiencies in the protocol as well as communicating any additional information required for the staff to complete the review of the protocol. The WQC staff may distribute the Sampling Protocol Form to the public. The WQC staff, in cooperation with the State Dredge Coordinator, will approve a sediment sampling plan so that the applicant may proceed with the sediment sampling. All staff involved in reviewing dredge sampling plans are required to be familiar with this protocol and with the standard laboratory and sampling methods proposed in the plans. Supervisors are responsible for ensuring that staff are familiar with and adhere to this SOP.

5. GUIDELINES AND PROCEDURES

5.1 General

A primary goal of the dredge program is to ensure that dredging in the marine environment and management of the associated dredge material

is conducted in a manner that is protective of groundwater and surface water quality so as to ensure the continued viability and integrity of drinking water and fish and wildlife resources. Ultimately, environmental and regulatory decisions are supported by the data of the type and quality needed for their intended use.

The dredged material must be properly sampled, analyzed and characterized to locate the best disposal options. A sampling protocol form, is used is used as the means through which an applicant provides their proposed sediment sampling plan information for how a sediment sample(s) is/are collected and analyzed. This sampling protocol form is included as part of this SOP as Appendix 1 and serves to provide method detection limits and appropriate sampling methods thereby ensuring that the material is characterized to the standards required to adhere to the applicable regulations.

It is also the responsibility of the Department to encourage the beneficial use of dredged material for Brownfields, redevelopment, beach nourishment, landscaping, habitat restoration and/or creation, construction projects, landfill cover and other useful purposes. The best options can be chosen after the material is properly characterized.

5.2 Procedures

- ☐ WQC staff provides an applicant the sediment sampling protocol which specifies the information needed for a sampling plan.
- ☐ A pre-application meeting may be held at the request of the applicant.
- ☐ The applicant provides a sediment sampling plan with a site plan to the Dredge Coordinator.
- ☐ The dredge coordinator will also coordinate comments from Office of Waste Management, RICRMC, USEPA, NOAA/NMFS, ACOE as appropriate.
- ☐ WQC staff reviews the completed sediment sampling protocol. Specific review items include:

5.3 Data Representation

- ☐ Is there an adequate number of samples based on the volume of the dredge proposed;
- ☐ WQC staff will assure that sample locations provide a representative profile of the majority of the sediment type within the project dredge area.
- ☐ WQC staff will confirm that the areas of potential contamination (i.e. gas/fuel docks, outfalls, known contamination sources, etc..) are properly represented;
- ☐ WQC staff will confirm that the depth of sampling is consistent with the proposed depth of dredge;

- ☐ WQC staff will confirm that the proposed detection limits are low enough to provide the necessary accuracy for the selected disposal option;
- ☐ WQC staff will confirm that the suite of chemical parameters and the sampling methods are consistent with the proposed disposal location (residential or industrial exposure criteria, beach nourishment criteria, CAD/CAD Cap criteria or in-water criteria) ;
- ☐ WQC staff will confirm that the suite of chemical and physical parameters and methods are consistent with the water quality classification and status of the water body (impaired or meeting water quality classification);

5.3.1 If all of these conditions are met; WQC staff will approve the sampling plan. The sampling plan must also be approved by DEM Groundwater, DEM Fish and Wildlife.

6.0 References

U.S. Army Corps of Engineers & USEPA. *Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Manual,* ***EPA 823-F-98-005,*** ***http://www.epa.gov/waterscience/itm/***

RIDEM, *Rules and Regulations for Dredging and the Management of Dredged Material*, February 2003, Regulation # DEM-OWR-DR-02-03

APPENDIX 1

Date:_____ Applicant(s): _____

Project Name:_____ Address:_____

Estimated Volume of Dredge (cy): _____ New (cy): _____ Maintenance (cy): _____

Area of Dredge (sf): _____ Depth of Dredge: _____

Proposed Disposal Location (include Plat/Lot if on land):_____

WQ Class of Dredge Area (if known): _____ GW Class of Disposal Area (if, known): _____

Sediment Sampling Plan for Dredging Projects

Submit Site plan 8½" x 11" (Google Earth printout and Navigation Chart or engineered plans) Mark all within 200' of proposed dredge limits:

- ❑ Outfalls and Gas docks or any other potential areas of contamination
- ❑ eelgrass, salt marsh, flounder or shellfish habitat
- ❑ Proposed dredge footprint and average depth of dredge

Proposed Depth of Samples _____
Proposed Coring Method _____
_____
# of Sampling Locations _____
_____

Submit Proposed Analysis and detection limits depending on disposal location: The detection limits for an analyte should be no greater than one-third (one-half log unit) of the appropriate value for the analyte and matrix of concern. Whenever possible, an MDL of three to five times below the criteria is expected: If the criteria are Non-Detect then the procedures and MRL's set forth in the OTM (USEPA and USACE 1991) below are appropriate to follow. In-water disposal must meet all Army Corps Requirements.

Place a ☐*CHECK* in each box you are proposing to sample and *CIRCLE i*ntended laboratory method.

Sample	Beach Criteria	CAD Cap Criteria	GA Leachability Criteria TCLP/SPLP	Residential Disposal Criteria[1]	Commercial/ Industrial Exposure[2]	TCLP Criteria for Haz. Waste[3]	Acceptable EPA Method(s)	MRL**
Grain Size	☐<10% silt/clay	☐	☐	☐	☐	☐		
% Moisture	☐<25%	☐	☐	☐	☐	☐		
TPH	☐ND	☐	☐500 mg/kg	☐500 mg/kg	☐2500 mg/kg		SW 8015C	100 mg/Kg
SVOC		☐	☐Table 2[3]	☐Table1[1]	☐Table1[2]		8270 SIM	10 ug/Kg
PCB	☐*ND	☐0.4 mg/kg	☐10 mg/kg	☐10 mg/kg	☐10 mg/kg		8082	* .02 mg/Kg
PAH		☐4.0 mg/kg					8270– Six (6) Tier 1 compounds	
Arsenic (As)	☐1.7 mg/kg	☐10 mg/kg		☐7.0 mg/kg	☐7.0 mg/kg	☐5.0 mg/L	6010,6020,7061,7062,7000, 7010	0.4 mg/Kg
Cadmium (Cd)	☐1 mg/kg	☐5 mg/kg	☐0.03 mg/L	☐39 mg/kg	☐1000 mg/kg	☐1.0 mg/L	6010,6020,7000,7010	0.07 mg/Kg
Chromium (Cr)	☐10 mg/kg	☐100 mg/kg	☐1.1 mg/L	☐390 mg/kg	☐10000 mg/kg	☐5.0 mg/L	6010,6020,7000,7010	0.5 mg/Kg
Copper (Cu)	☐10 mg/kg	☐200 mg/kg		☐3100 mg/kg	☐10000 mg/kg		6010,6020,7000,7010	0.5 mg/Kg
Lead (Pb)	☐25 mg/kg	☐100 mg/kg	☐0.04 mg/L	☐150 mg/kg	☐500 mg/kg	☐5.0 mg/L	6010,6020,7000, 7010	0.5 mg/Kg
Mercury (Hg)	☐0.5 mg/kg	☐0.5 mg/kg	☐0.02 mg/L	☐23 mg/kg	☐610 mg/kg	☐0.2 mg/L	7470,7471,7472	0.07 mg/Kg
Nickel (Ni)	☐5 mg/kg	☐50 mg/kg	☐1 mg/L	☐1000 mg/kg			6010, 6020,7000, 7010	0.5 mg/Kg
Zinc (Zn)	☐25 mg/kg	☐200 mg/kg		☐6000 mg/kg			6010,6020,7000,7010	1.0 mg/Kg
TCLP or SPLP							1311 or 1312	
Barium (Ba)						☐100 mg/L	6010, 6020	
Selenium (Se)						☐1.0 mg/L	6010, 6020, 7741, 7742	
Silver (Ag)						☐5.0 mg/L	6010, 6020	

* For each arochlor **For Beach Critera – any other MRL should be at least three to five times below the criteria

[1] Residential Direct Exposure Criteria are defined in Table 1 in Section 8 of the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases.

[2] Commercial/Industrial Direct Exposure Criteria are defined in Table 1 in Section 8 of the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases.

[3] GA Leachability Criteria are defined in Table 2 in Section 8 of the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases.

Approvals

Dredge Coordinator (CRMC) : _____ Date: _____

WQC Program (DEM): _____ Date: _____

GW Program (DEM), if upland__ _____ Date: _____

Dredge Coordinator (DEM): _____ Date: _____

COVERSHEET
STANDARD OPERATING PROCEDURE
APPROVALS:

DEM Quality Assurance Manager:

Thomas Getz _____ Thomas Getz _____ Date: 4/8/09
Print Name Signature

Assistant Director of Water Resources

Alicia Good, PE _____ Alicia Good _____ Date: 3/19/09
Print Name Signature

Assistant Director of Air, Waste and Compliance

Terrance Gray _____ Terrance Gray _____ Date: 3/25/09
Print Name Signature

If Appropriate,
Associate Director of Natural Resources

Larry Mouradjian _____ Larry Mouradjian _____ Date: 3/25/09
Print Name Signature

DISTRIBUTION:

(X)Office of Air Resources.....By: ____ Date: ____
(X)Division of Agriculture.....By: ____ Date: ____
(X)Office of Waste Management.....By: ____ Date: ____
(X)Office of Compliance and Inspection.....By: ____ Date: ____
(X)Office of Technical and Customer Assistance.....By: BG Date: 3/16/09
(X)Groundwater and Wetlands Protection.....By: RSW Date: 3/16/09
(X)Surface Water Protection.....By: ____ Date: 3/27/09
(X)Water Quality and Standards.....By: ____ Date: ____
( ) Office of the Director.....By: ____ Date: ____
(X) Quality Management Team .....By: ____ Date:

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