

DRAFT

APPENDIX B

Management of Dredged Materials for Land Disposal

Policy: In an effort to promote the environmentally responsible and cost-effective management of dredged materials, the Rhode Island Department of Environmental Management (DEM) has developed this policy to define the alternatives for disposal of dredged material on land. The processes and alternatives set forth in this policy are based on the physical and chemical characteristics of the dredged material and the environmental characteristics of the proposed disposal site. Disposal of dredged materials in compliance with these criteria prevents unnecessary adverse impacts on the waters of the state, prevents unnecessary destruction of aquatic habitat, protects public health, and preserves the limited and finite capacity of the State's solid waste landfills. In developing this policy, the Department recognizes the need to balance environmental degradation and improvements and will ensure that the use of dredge material will be done in areas suitable for those activities based on risk-based criteria. In the analysis of this issue, the Department has determined that the potential benefits of this policy far outweigh the impacts from land disposal of dredge materials as specified herein. This policy is formulated to ensure that all alternatives are within acceptable risk ranges set by Rhode Island law and regulation.

All dredged material, whether from a freshwater, brackish or saltwater environment shall be regulated in accordance with this policy until such time that a more direct system is developed for the regulation and reuse of dredged materials. This policy is **not** intended to be a guide to all of the agencies and regulatory programs that may have jurisdiction for a particular project (Army Corps of Engineers, Coastal Resources Management Council, DEM Freshwater Wetlands Program et cetera). This policy does not cover the disposal of dredged materials in the water, i.e., the return of dredged materials to the aquatic environment.

The Department recommends that anyone planning a dredging project contact the Office of Technical and Customer Assistance for a pre-application meeting.

With the exception of near shore disposal areas in the vicinity of the dredging activity, the land disposal of any dredge material from a salt water environment is prohibited in areas where the groundwater is classified as GAA, in areas classified GA where public water is not available, in the watershed of a drinking water reservoir, and in areas that are classified as a Wellhead Protection Area as they are defined in the *Rules and Regulations for Groundwater Quality*.

All dredging projects must receive a Water Quality Certificate from the Office of Water Resources (see WQC Dredge Guidance Document), which will also conduct the review for a Groundwater Quality Certification, where applicable. For any disposal location, the material cannot adversely impact, or have a substantial likelihood of adversely impacting, current uses of groundwater. The Office of Waste Management may also review the characterization of the

dredged material, evaluate the proposed disposal location, and work with the applicant to develop and record an Environmental Land Use Restriction on the proposed disposal site, where required. All projects must meet the requirements for the control of fugitive dust and odors, as set out in *Air Pollution Control Regulations Nos. 5 and 7*, respectively.

Characterization of Materials

Accurate characterization of the material that may be dredged is critical to determining the scope, cost, and feasibility of a project, as well as for determining the regulatory requirements that may apply to the dredged material. DEM will directly support the development of a sampling plan on a project-by-project basis through a pre-application process prior to the preparation and filing of the application package for the Water Quality Certificate. In many cases, the scope of the project will be determined by the results of the sampling and the availability of a disposal site (which is also directly related to the results of the sampling). Hopefully, these pre-application discussions will result in higher quality applications and may prevent further costs being incurred on infeasible or impractical projects.

For each project, DEM will provide the applicant with the opportunity for a pre-application meeting, arranged through the Office of Technical and Customer Assistance, to discuss a sampling plan. Prior to this meeting, the applicant must develop and submit a proposed site plan outlining the potential area of the project and proposed depth of dredging. Proposed sampling locations, based on activities at or around the site to be dredged, must be clearly identified and should be biased toward the locations of any historical spill areas or areas of known contamination. Activities that may be sources of pollutants, such as fueling docks, outfalls, and areas adjacent to maintenance areas, should be investigated. The applicant must include their rationale for selecting their proposed locations as part of the plan. This plan will be the basis for the discussions at the pre-application meeting.

The discussion of the sampling plan will also determine the parameters that the samples will be tested for and the extent that composite samples may be used, if applicable. At a minimum, the following parameters must be tested for:

- Grain Size Analysis (including percent moisture)
- Polychlorinated Biphenyls (PCBs)
- Total Petroleum Hydrocarbons (TPH)
- Total Metals

When developing a sampling plan and protocol, analysis of some samples using the Toxicity Characteristic Leaching Procedure (TCLP), test Method 1311 in "Test Methods for Evaluating Solid Waste" EPA Publication SW-846 (<http://www.epa.gov/epaoswer/hazwaste/test/1311.pdf>), may be necessary. If TCLP analysis is required, the applicant may hold the sample, following necessary holding time requirements, and determine whether to run the test based on the results of the total metals analysis. The appropriate sample containers and holding times are listed in the table below:

<u>TCLP Samples</u>				
PARAMETER	VOL.	CONTAINER	PRES ERVATIVE	HOLDING TIME TO TCLP EXTRACTION
METALS	16 oz.	Glass	None	180 days
MERCURY	16 oz.	Glass	None	28 days
BASE/NEUTRAL & ACID COMPOUNDS	16 oz.	Glass	None	14 days
CHLORINATED PESTICIDES & HERBICIDES	16 oz.	Glass	None	14 days
VOLATILES	8 oz.	Glass	None	14 days

It may not be necessary to run TCLP analyses if the results of the total metals results are low enough. The TCLP laboratory procedure requires the sample to be diluted by a ratio of 20:1 when preparing a solid sample for acidic extraction, and subsequent leachate analysis. Assuming that the entire mass of the contaminants present in the sample will leach out during the extraction process, the dilution factor of 20 can be applied to the actual contaminant concentration to give a **MAXIMUM POSSIBLE** contaminant concentration obtainable in the leachate. Once the total contaminant concentration in the sample is known, and then the **MAXIMUM POSSIBLE** contaminant in the TCLP extract can be determined by dividing the contaminant concentration obtained from the total metals analysis by twenty (20). If the **MAXIMUM POSSIBLE** TCLP as determined by the above calculation is less than the Regulatory Level for the individual contaminant then this would be less than the threshold for definition as a hazardous waste or the leachability criteria (if the applicant chooses to use the TCLP test, as opposed to the SPLP test [EPA Method 1312], for leachability analysis).

Additional sampling and analysis, including analysis for semi-volatile organic compounds, pesticides and herbicides, may also be required based on identified site conditions and/or specific program requirements. Determinations will be made as part of the pre-application process for the specific site.

Once an approach and sampling plan is deemed acceptable, DEM will provide written acknowledgement and approval of the sampling plan and identify the person who will serve as the point of contact for the project. The target timeline for this written acknowledgement and approval of the sampling plan will be two weeks from the time of agreement. Once the plan has been approved, the applicant may go forward with implementation. If changes are made to the plan during implementation, the previous agreement and approval may not continue to apply. When such changes are found to be necessary, it is critical that they be immediately communicated to DEM through the point of contact identified above to avoid future problems on the project. The applicant may also develop and implement a sampling plan without DEM input or approval, although they do so at their own risk. If the applicant proceeds without DEM review and pre-approval, the sampling procedures will be reviewed as part of the Water Quality

Certificate. Finally, the applicant may have to submit their sampling plan to the Army Corps of Engineers for review and approval, depending on the specific details of the project.

Once the results of the sampling have been received, the applicant may request a second pre-application meeting to help the applicant identify potential disposal sites based on results of sampling and discuss refinements of the project design. In order to assist the applicant in his identifying potential sites for the disposal and/or use of their dredge material or concluding that potential sites already identified by the applicant should be pursued further, DEM will provide written acknowledgement of the results of the sampling and a determination as to what category applies to the material based on the results provided (such as, “based on the results provided, the material appears to be below the Residential Direct Exposure Criteria and can be managed as such in accordance with these regulations”). The target timeline for this written acknowledgement will be two weeks from the time the results are received by DEM. If a second pre-application meeting is requested, DEM will notify CRMC of this meeting and invite them to participate to allow multi-agency coordinated input into the design. This meeting should result in a higher quality application for a Water Quality Certificate.

Once material has been characterized, the disposal of dredged materials on land is managed based on the following:

1. Use of dredged materials for beach nourishment;
2. Disposal of dredged materials that are below the Residential Direct Exposure Criteria noted in the *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases* (The Remediation Regulations);
3. Disposal of dredged materials that are above the Residential Direct Exposure Criteria but below the Industrial/Commercial Direct Exposure Criteria in the Remediation Regulations; and
4. Disposal of dredged materials that exceed the Industrial/Commercial Direct Exposure Criteria in the Remediation Regulations.

1. Use of Dredged Materials for Beach Nourishment

Projects that propose the use of dredge materials for beach nourishment must meet the criteria set forth in Section 5 of this policy for beach nourishment, based on sampling and analysis as described in the approved sampling plan, and must meet all applicable criteria for a Water Quality Certification. Projects that propose the use of dredge materials for beach nourishment will be evaluated through a single review process administered by the Office of Water Resources. Review by the Office of Waste Management is not required.

2. Use of Dredged Materials that meet the Residential Direct Exposure Criteria

Dredged materials that do not exceed the Residential Direct Exposure Criteria, based on sampling and analysis as described in the approved sampling plan, may be disposed on land under one of the following options:

- A) The proposed disposal site is in an area where groundwater is classified GB, provided it does not impact current uses of groundwater at or around the disposal site;

- B) The proposed disposal site is in an area where groundwater is classified GA that is not otherwise prohibited (areas where public water is not available and areas that are classified as Wellhead Protection Areas) provided the material meets GA Leachability standards, does not impact current uses of groundwater at or around the disposal site, and has acceptable chloride levels (establishment of acceptable chloride levels and desalting methods needs further study).

Also, where the disposal site is also in an area within 200 feet inland of Mean High Water, the land upon which the dredged materials will be disposed shall be in the vicinity of the dredging activity.

For all options noted above, no Conservation Easement, Environmental Land Use Restriction, or Notice on the Deed for the property is required.

3. Use of Dredged Materials that meet the Industrial/Commercial Direct Exposure Criteria

Dredged Materials that are above the Residential Direct Exposure Criteria but meet the Industrial/Commercial Direct Exposure Criteria, based on sampling and analysis as described in the approved sampling plan, may be disposed on land under the following options:

- The property is currently used for industrial/commercial activities and the reasonably foreseeable future use of the site will be for commercial/industrial activities; AND,
- An Environmental Land Use Restriction, as described in the Remediation Regulations is required with respect to the property, or to the portion of the property containing the dredge material.

Additionally, at least one of the following scenarios must be present:

- A) The property is in an area where groundwater is classified GB, provided it does not impact current uses of groundwater at or around the disposal site; or,
- B) The property is in an area where groundwater is classified GA that is not otherwise prohibited (areas where public water is not available and areas that are classified as Wellhead Protection Areas), provided the dredge material meets GA Leachability criteria, does not impact current uses of groundwater at or around the disposal site, and has acceptable chloride levels (establishment of acceptable chloride levels and desalting methods needs further study);

Typically, marina operations are considered to be Commercial/Industrial uses of property, except where the marina property includes residential areas or recreational areas (such as playgrounds), in which case the property is considered residential.

4. Use of Dredged Materials that exceed the Industrial/Commercial Direct Exposure Criteria

Dredged Materials that exceed the Industrial/Commercial Direct Exposure Criteria in the Remediation Regulations must be properly characterized and shall only be disposed at a facility licensed for the acceptance and management of such material.

5. Sediment Characterization Criteria

Beach Nourishment Criteria are defined in the Office of Water Resources Guidance on Dredging and Disposal of Dredged Material in Rhode Island for Water Quality Certification.

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. If that Table is amended, those amended criteria will be applicable.

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. If that Table is amended, those amended criteria will be applicable.

Industrial/Commercial 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. If that Table is amended, those amended criteria will be applicable.

Criteria for acceptable chloride content or desalting methods (when developed).

These criteria are outlined below for comparison purposes:

Constituent	Beach Nourishment Criteria	Residential Direct Exposure Criteria¹	Commercial/Industrial Direct Exposure Criteria²	TCLP Criteria for Hazardous Waste Determination	GA Leachability Criteria³
% Solids	75	NA	NA	NA	NA
% Volatile Solids	1	NA	NA	NA	NA
% Hexane Sol Fraction	0.1	NA	NA	NA	NA
Total Petroleum HC	NA	500 ppm	2500 ppm	NA	500 ppm
PCB's	NA	10 ppm	10 ppm	NA	10 mg/kg
Arsenic (As)	5 mg/kg	1.7 mg/kg (subject to ongoing review)	3.8 mg/kg (subject to ongoing review)	5.0 mg/L	NA
Cadmium (Cd)	1 mg/kg	39 mg/kg	1000 mg/kg	1.0 mg/L	0.03 mg/L
Chromium (Cr)	10 mg/kg	390 mg/kg	10000 mg/kg	5.0 mg/L	1.1 mg/L
Copper (Cu)	10 mg/kg	3100 mg/kg	10000 mg/kg		
Lead (Pb)	25 mg/kg	150 mg/kg	500 mg/kg	5.0 mg/L	0.04 mg/L
Mercury (Hg)	0.5 mg/kg	23 mg/kg	610 mg/kg	0.2 mg/L	0.02 mg/L
Nickel (Ni)	5 mg/kg	1000 mg/kg	10000 mg/kg	NA	1 mg/L
Vanadium (V)	25 mg/kg	550 mg/kg	10000 mg/kg	NA	NA
Zinc (Zn)	25 mg/kg	6000 mg/kg	10000 mg/kg	NA	NA

Other TCLP criteria to be considered to determine if the material is hazardous waste:

Constituent	TCLP Criteria for Hazardous Waste Determination
Barium (Ba)	100.0 mg/L
Selenium (Se)	1.0 mg/L
Silver (Ag)	5.0 mg/L

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 Industrial/Commercial 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.

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