

**Channel Dredging and Disposal at Sea****Cheticamp (La Digue) Small Craft Harbour****Inverness County, N.S.****R.121899.001**

Dredging

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**PART 1 - GENERAL**

- 1.1 Description
- .1 The site of the work includes dredging the Cheticamp (La Digue) Small Craft Harbour channel, Inverness County, Nova Scotia, with disposal of the dredge material at sea at the designated ocean disposal site in a 4.25km northwesterly direction (DAS Permit Attached **Appendix A**). Area to be dredged, and location of disposal site are shown on plan and Specification **Appendix C**.
- .2 This section specifies requirements for excavating underwater materials in areas and to dimensions and coordinates indicated on plan, and for transporting and disposing of excavated materials to specified locations.
- 1.2 Related Work
- .1 Refer to Environmental Protection Procedures for Marine Work - Section 01 35 44 for related information.
- 1.3 Definitions
- .1 Dredging: excavating, transporting and disposing of underwater materials as specified.
- .2 Class "A" Material: boulders or concrete debris with each unit containing 3.0 cubic metres or more, and solid rock requiring drilling and blasting or hydraulic splitting to loosen.
- .3 Obstruction: material other than Class "A", having individual volumes of 3.0 cubic metres or more.
- .4 Class "B" Material: loose or shale rock, sand, quick sand, mud, shingle, clay and sand, gumbo, hardpan, clay, marine clay, clay sizes, marine silt, silt and gravel, gravel, cobbles, boulders, marine shells, or any other materials not defined under Class "A" material.

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- .5 Debris: pieces of wood, wood chips, bark, logs, submerged logs, tree branches, scrap vehicle tires, concrete, steel cable, steel chain, wire rope, scrap steel, etc.
- .6 Square Metres: area is square metres projected horizontal.
- .7 CMPM: cubic meters place measurement, based on neat plan drawings or pre and post hydrographic dredge surveys.
- .8 Grade: plane or planes above which all material is to be dredged.
- .9 Estimated Quantity: volume in cubic metres of material calculated to be above dredge grade and within side slopes, unless otherwise specified.
- .10 U.T.M. Coordinates: Universal Transverse Mercator plan rectangular grid system to be used for all horizontal control of dredging operations as indicated on plan. (NAD 83)
- .11 Matrix Block: each block area is presented as a number of 1.2 X 3.0 m long blocks. Dependent on the position of the sounding a block may have 1 to 4 sounding contained within it. A blank Matrix Block will indicate that no sounding was registered for that matrix.
- .12 Minimum Depths Plan: a hydrographic survey in which shallowest depth from an average high resolution bathymetric survey or XYZ within the matrix block is plotted.
- .13 Average Depths Plan: a hydrographic survey plan in which the average depth from an average high resolution bathymetric surface or XYZ within matrix block is plotted.
- .14 Average of Instantaneous Plan: a hydrographic survey plan in which the
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average of instantaneous soundings in that matrix block is plotted.

- .15 Average of Instantaneous Plan: a hydrographic survey plan in which the average of instantaneous soundings in that matrix block is plotted.
  - .16 Side Slope: inclined surface or plane from grade at side limit of dredging area to intersect original ground line outside of side limit and to be expressed as a ratio of horizontal to vertical. All material above side slopes is to be dredged.
  - .17 Cleared Area: a dredge area that has been accepted by the *Departmental Representative* as complying with plans and specifications and all material removed to grade.
  - .18 Box Cut: dredging and letting the side of the excavation collapse, where possible, to an equilibrium slope.
  - .19 Chart Datum: by international agreement, a plane below which the tide will seldom fall. The Canadian Hydrographic Services has adopted the plane of Lowest Normal Tide (LNT) as Chart Datum. As the rise, fall and ranges of tides varies daily, The Canadian Hydrographic Services should be consulted for tidal prediction and other tidal information relating to the work.
  - .20 CEPA: Canadian Environmental Protection Act.
  - .21 Dredging Area: a rectangle or polygon, defined by coordinates in which dredging is to take place.
  - .22 Low Low Water Large Tide (LLWKT)" The average of lowest low waters. One from each of 19 years of predications.
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- .23 Lowest Normal Tide (LNT): plane so low that tide will seldom fall below it.
- 1.4 Submittals .1 Certificates:
- .1 Provide copies of all permits and licenses required to carry out the work.
- 1.5 Location .1 Contract drawings indicate those areas which require dredging at the time of the most recent surveys. Actual extent of dredging within the areas may vary slightly from those indicated on the drawings.
- 1.6 Schedule of Work .1 Submit to *Departmental Representative*, within 5 working days after award of Contract, a schedule of work including time periods during which each operation involved in the work will be undertaken. Also submit an estimated monthly dredging production of material in cubic metres for each operation. At the time of submission of the schedule meet with the *Departmental Representative* to review the schedule.
- .2 Include in the above schedule of work a list of buoys which interfere with the progress of this work. Coordinate with the *Departmental Representative* arrangements to be made to relocate these buoys to avoid unnecessary delay.
- .3 Adhere to the schedule and take immediate action to correct any slippage by effectively altering existing dredging operations or mobilizing other equipment. The *Departmental Representative* is to be notified of the corrective action to be taken.
- 1.7 Interference to Navigation .1 Be familiar with activities at dredging sites and vessel movements in areas affected by dredging operations.
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- .2 Plan and execute work in a manner that will not impede navigation including movement of vessels in the channel, at any wharf site being dredged, or any other boat traffic at adjacent wharves in the harbour.
  - .3 Plan and execute work in a manner that will not interfere with activities at wharf sites, or access to wharves by land or water.
  - .4 The *Departmental Representative* or owner will not be responsible for loss of time, equipment, material or any other charges related to interference with vessels in the harbour, weather conditions, or due to other Contractor's operations.
  - .5 Prior to any removal/reinstallation of navigational aids/buoys, contact Canadian Coast Guard in Charlottetown at 1-902-566-7936.
  - .6 Keep Canadian Coast Guard informed of dredging operations, in order that necessary Notices to Shipping can be issued.
  - .7 Be responsible for damage to buoys or other navigation markers cause by dredging operations. If such occurs, notify Canadian Coast Guard. Assume responsibility for replacement or repairs.
- 1.8 Interface to  
Fishery Operations  
and Damage to  
Fishing Gear
- .1 Become familiar with fishery activities. Clearly mark dredging area, disposal areas and routes to and from dredging and disposal areas during periods when fishing gear is set in areas adjacent to dredging operations with "Cautionary Buoys" in accordance with Coast Guard Standard TP968.
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([349667.pdf \(dfo-mpo.gc.ca\)](#))

All buoys must be coloured cautionary yellow - CGSB # 505-108, and be equipped with radar reflectors.

Be responsible for all costs associated with the supply, installation and removal of all necessary temporary aids. The Contractor will receive approval from the District Fisheries Officer for the location of the buoys, upon review and acceptance of temporary aids by the *Departmental Representative*.

Keep Canadian Coast Guard informed of buoyed corridors in order that necessary Notices to Shipping can be issued.

- .2 Execute the work to ensure damage does not occur to fishing gear and interference to fishing operations is minimized by conducting operations within the areas so marked.
- .3 Be responsible for damage to fishing gear outside marked areas, if as a result of dredging activities, and if damage occurs, assume responsibility for replacement or repair costs and cost of lost fishing opportunity.

1.9 Requirements  
of Regulatory  
Agencies

- .1 Perform work in accordance with the National Building Code of Canada (NBC) and any other municipal, provincial and/or national codes relating to the project including the provisions of the Canadian Environmental Assessment Act Permit issued for this project. In any case of conflict or discrepancy, the more stringent requirements will apply.
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- .2 Meet or exceed requirements of specified standards, codes and referenced documents.
  - .3 Mark floating equipment with lights in accordance with Regulations for the Prevention of Collisions, as required by Transport Canada.
  - .4 Contractor will be required to obtain prior approval from applicable regulatory agencies for any dredging outside specified dredging limits.
  - .5 Perform work in accordance with the requirements that will be provided under the following authorizations:
    - .1 *Canadian Environmental Protection Act (CEPA)* Disposal at Sea Permit

1.10 Floating Plant

- .1 Dredges or other floating plants which are to be employed on this work, must meet the requirements as specified in General Instructions R2710T.

1.11 Datums

- .1 Horizontal Datum: All horizontal coordinates used in this specification and contract drawings are in metres referenced to U.T.M. projection based on the North American Datum, 1983, (NAD83, Zone 19). Survey control monuments and their coordinate values are shown on Plan. Additional coordinate monument locations and values can be obtained from the appropriate Land Registration and Information Services department.
- .2 Vertical Datum: All elevations and soundings used in this specification and contract drawings are in metres referenced to Chart Datum. For purposes of this contract see Section 3.1.6 for tidal data information.

1.12 Inspection

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<u>of Site</u>	.1	The Contractor must visit the site of the work before tendering and make himself thoroughly familiar with the extent and nature of the work and all conditions affecting the work.
1.13 <u>Site Information</u>	.1	Results of the most recent soundings are included on the drawings. This pre-tender data is made available for tendering purposes only. It should be noted that this information may differ from present site conditions.
	.2	It is anticipated that the following materials will be encountered within the dredging limits, but are not limited to:  Class "B" Materials in all areas
	.3	The Contractor shall take the necessary steps to become fully familiar with potential inclement weather and sea conditions in this area.
	.4	The Contractor will be responsible for making his own interpretation of soil conditions.
1.14 <u>Dredging Equipment</u>	.1	Provide suitable lighting on the dredge for free movement of <i>Departmental Representative</i> to inspect work in progress during night dredging operations. Lighting to illuminate all walkways, ladders etc. to safely permit inspection of dredging operation.
	.2	The physical description of materials, as described in <b>Appendix B</b> (Marine Sediment Sampling Program), is based on small samples and is not necessarily indicative of the overall soil conditions.
	.3	On request, prove to the satisfaction of the <i>Departmental Representative</i> that the dredging equipment and plant are adequate to

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finish the work to quality, time and production rates specified. If Inadequate, replace or provide additional equipment or plant as directed.

- .4 Contractor shall be responsible for ensuring that equipment can access and function at the disposal site.

1.15 Survey  
Requirements

- .1 The Contractor shall provide, at Contractor's own expense, a survey vessel, equipment and crew to set up and maintain survey control for the location of the dredge and dredge limits and to sound areas immediately after dredging to verify that grade depth has been attained. Areas are to be sounded with adequate coverage to provide a bathymetric printout of at least a 5 metre spacing on a UTM grid to the approval of the *Departmental Representative*. A copy of the Contractor's positioning and sounding records shall be provided to the *Departmental Representative*.

1.16 Sequence of  
Acceptable Work

- .1 Pre-dredge and post-dredge surveys will be conducted by PWGSC using electronic survey equipment sounding in the instantaneous mode. Sounder will be the Ross sounder sweep system using a 190-210 kHz transducer frequency positioned by DGPS Trimble R7 system. The results will be shown on survey plan at scale of 1:500 plotting average of instantaneous depths. Other survey procedures may be approved by the *Departmental Representative*.
- .2 A pre-dredge survey will be carried out by the *Departmental Representative* prior to commencement of dredging work by the contractor. The dredge limits may be revised by the *Departmental Representative* to accommodate the changes in bathymetry that may have occurred between the pre-dredge
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survey and the initial tender survey. Revision of the cubic metre quantity will take place accordingly if the dredge limits are revised.

.3 No area will be dredged prior to *Departmental Representative* and Contractor's mutual acceptance of the pre-dredge survey for that area.

.4 Post-dredge survey will be undertaken by the Contractor upon completion of dredging of all areas identified in pre-dredge survey. Submit results as indicated in item 1.14 above. Only when this survey shows that all soundings are at or below grade that the *Departmental Representative* will do a post-dredge survey. The survey will use the same type of equipment as used in the pre-dredge survey. It will be subject to weather conditions and the availability of functional survey equipment. The survey will confirm if dredging is completed as specified. Survey will be by electronic sweep equipment sounding in instantaneous mode. Survey plan at 1:500 scale plotting the average of instantaneous depths obtained in this survey will identify areas requiring reworking to obtain the dredge grade depths where indicated on the plan.

The Contractor will redredge as necessary to remove all material within the dredge areas which is found to be above the average of instantaneous elevations as specified on post dredge survey drawings.

.5 All additional surveys require to clear the dredge area will be undertaken by the *Departmental Representative* at Contractor's cost.

.6 All surveys will be performed to Canadian Hydrographic Service Standards. Surveys

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1.17 Measurement  
for Payment

- completed with machine mounted equipment will not be considered for payment purposes.
- .1 Dredging and removals will be measured in accordance with Section 01 29 00.
- .2 The dredge areas are defined by coordinates and dimensions, as shown on the drawings.
- .3 For the purpose of quantity computation, existing seabed elevation will be represented by and "Average of Instantaneous" sounding for each matrix block of the pre-dredge survey performed by the *Departmental Representative* as soon as practical after contract award. Post dredging elevations for quantity computations will be: (1) grade, or (2) the "Average of Instantaneous" sounding for each matrix block of the post dredge survey, whichever is shallower. The method of calculation and the quantity of material removed for measurement for payment will be determined by the *Departmental Representative*.
- .4 No payment will be made for the Contractor's survey vessel, equipment and crew or diving services.
- .5 All operations in connection with the field positioning of dredging equipment will be considered incidental to the work and will not be measured separately for payment.
- .6 Payment for dredging shall include the disposal of dredge material, at the approved disposal at sea (DAS) site.

**Disposal of dredge material must be in accordance with the Dredge Material Disposal Plan (DMDP) to be prepared by the Contractor.**

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Refer to **Environmental Protection Procedures for Marine Work - Section 01 35 44** for related information.

**Contractor to NOTE:** Land based disposal of dredge material, temporarily or otherwise, is not and will not be considered a dredge disposal option. Contractor shall not consider land based disposal as part of dredge disposal methodology.

- .7 There will be no additional payment for temporary structures used in dredging operations.
  - .8 There will be no additional payment for delays caused by fishing seasons.
  - .9 There will be no additional payment for delays caused by vessel traffic.
  - .10 There will be no additional payment for down time, mechanical or weather-related.
  - .11 There will be no additional payment for delays caused by navigational buoys in dredge areas.
  - .12 Once designated areas have been dredged and cleared, all subsequent infilling shall be deemed as additional to the contract if removal is required.
  - .13 Removal of material infilling during dredging will not be measured separately for payment.
  - .14 There will be no additional payment for land disposal of debris not suitable for the offshore disposal at sea (DAS) site.
  - .15 There will be no additional payment for berthing or mooring facilities for the dredge plant or any other floating equipment.
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- .16 The entire area of each site, at all sites, as shown on the plan, shall be fully covered during dredging.
  - .17 There will be no additional payment for delays or changes in dredging methods required as a result of water quality monitoring results.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION3.1 General

- .1 The Contractor shall do the following in executing the work:
  - .1 Mark floating equipment with lights in accordance with International Rules of Road and maintain a radio watch on board.
  - .2 Place and maintain buoys, ranges, markers and lights required to define work. The *Departmental Representative* will provide the coordinate values for all dredge limits on the drawings.
  - .3 Maintain and lay out work form bench marks and control points as shown on Plan and noted in the Specifications. Any additional control points and tidal reference stations required to control dredging operations are the responsibility of the Contractor. The Contractor is to maintain these control points and tidal reference stations for the duration of the project and at the Contractor's cost.

Obtain owner's permission, in writing, to establish layout monuments and erect targets on private property and pay all

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associated rental costs. Provide access to layout monuments for departmental survey crews. Any damage to private property will be made good by the Contractor to the satisfaction of the *Departmental Representative* at no cost to the owner.

- .4 For accurate dredge control, the Contractor is to provide and maintain on the dredge electronic position fixing and distance measuring equipment with associated computer software capable of providing a printout showing dredge position. Equipment is to provide a continuous coordinated position of the dredge in the U.T.M. Coordinate Grid System with an accuracy of  $\pm 3.0$  metres or less.
- .5 All survey equipment provided on the dredge by the Contractor is to be made accessible to the *Departmental Representative* for his use.
- .6 Establish accurately and maintain water level gauges or tide boards in order that proper depth of dredging can be determined. Locate gauges so as to be clearly visible at all times.

The Contractor is to provide a tidal monitoring system to read and record the tide level at a maximum of 15 minute intervals. These records are to be made available for the inspection and use of the *Departmental Representative*. If using an electronic tide gauge, the Contractor must check the accuracy of the gauge daily. The gauge must be accurate to  $\pm 2$  cm. The monitoring system is to be approved by the *Departmental Representative*.

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- .7 Dredge areas to grade depths below Chart Datum where indicated on the drawing.
  - .8 Dredge all side slopes to two horizontal to one vertical unless otherwise noted.
  - .9 Remove all materials above specified grade depth and side slopes, within limits indicated. Material removed from below grade depth or outside specified area or side slope is not part of work and will not be measured.
  - .10 Remove shoaling which occurs as a result of the work at no expense to *Departmental Representative*.
  - .11 Remove material cast-over onto surrounding area and dispose of it as dredged material at Contractor's expense. Casting over of material is not permissible unless authorized by the *Departmental Representative*.
  - .12 The Contractor is responsible for the removal of infilling in dredge areas which occurs prior to acceptance by the *Departmental Representative*.
  - .13 It will be the Contractor's responsibility to gain access to the dredge area. The construction of causeways, roads, etc., will be at the Contractor's expense and will be removed at the completion of the project. Any derricks, power lines, etc., which will require removal will be done so at the Contractor's expense and will be replaced to satisfaction of the *Departmental representative*. Contractor to advise *Departmental representative* of his proposed method
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to carry out dredging and disposal of the material.

.14 Immediately notify the *Departmental Representative* upon encountering any object which might be classified as an obstruction. By-pass the object, after clearly marking its location by coordinates and continue work.

.15 Provide dump scows capable of maintaining dredge materials within hoppers until delivery to disposal site. The *Departmental Representative* has the right to order removal of dump scows from the site where leakage from the dump scows is deemed to be excessive.

.16 Arrange and pay for berthing and mooring facilities for dredge plant and other floating equipment.

3.2 Encountering  
Class "A"  
Material

.1 Identify areas where Class "A" material is encountered above specified dredge grade, work equipment, which may require the use of toothed buckets, over areas to remove all Class "B" material, until *Departmental Representative* is satisfied that further removal cannot be accomplished without blasting. Immediately identify these areas with UTM coordinates, and provide information to *Departmental Representative*.

3.3 Rock Removal

.1 If rock or boulders are to be removed by blasting, submit to *Departmental Representative* for review, two weeks before removal, details of proposed blasting operations showing types and quantities of explosives, loading charges and patterns, type of caps, blasting techniques, blast protection measures, time of blasting and other pertinent details. Submit subsequent

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- charges to *Departmental Representative* before proceeding.
- 3.4 Existing Navigation Buoys .1 The Contractor will make arrangements with Transport Canada for the removal and reinstallation of the existing buoys, as required to carry out the dredging operations.
- 3.5 Disposal of Dredge Materials .1 The Contractor shall dispose of dredged material by depositing in the disposal area as identified in **Section 01 35 44** and in such a manner as approved by *Departmental Representative*.
- Contractor to NOTE:** Land based disposal of dredge material, temporarily or otherwise, is not and will not be considered a dredge disposal option. Contractor shall not consider land based disposal as part of dredge disposal methodology.
- .2 The Contractor shall dispose of dredge material by depositing within the disposal area as identified in the DAS Permit and outlined on the drawings and in such a manner as approved by the *Departmental Representative* while conforming to the Permit requirements.
- .1 Dredge disposal operations are to comply with any/all conditions/requirements of the Disposal at Sea Permit issued for the project.
- .2 Dredge disposal will be carried out by barge or dump scow.
- .3 Define the area of disposal sites with lighted marker buoys, if sites are not defined by existing M.O.T. buoys. No dumping of material will be permitted until the disposal site buoys are in place.
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.4 The Contractor shall take notice that materials to be dumped will consist of all types of Class "B" material, boulders, and debris except as noted in the CEPA Permit. The description as given in the CEPA Permit is by definition, a list of sample soil parameters only.

.5 **The disposal site is defined as 150 m radius circle from centre point of disposal at sea site (northings and eastings as noted on Plan - Sheet 1 of 1) and DAS Permit.**

Dredged material is to be disposed of at the Disposal at Sea (DAS) site in a grid pattern so as to avoid centre piling, creating a navigation hazard, particularly in shallow coastal areas.

.6 Provide electronic positioning equipment of the tug daily to verify the position of the disposal events.

If requested, allow the *Departmental Representative* or Inspector access to record the position of disposal of disposal events.

**All electronic positioning data of the location of each disposal event will be provided daily to *Departmental Representative*. Any disposal that occurs outside the 150 m radius of the disposal site will be in violation of the *Canadian Environmental Protection Act (CEPA) Permit*.**

.7 Timber, logs and cable must not be disposed of at the dumpsites. This debris must be disposed of ashore at an appropriate landfill other than the containment facility. This debris and its disposal will not be measured for payment but is incidental to dredging.

3.6 Operations in  
Vicinity of

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<u>Structures</u>	.1	Use extreme care when dredging adjacent to existing structures. Any damage to these structures caused by dredging closer than specified to be repaired at Contractor's expense. In completing repairs, new materials are to be used. All materials and work performed to be approved by the <i>Departmental Representative</i> .
	.2	Do not dredge material from areas lying within 5.0 metres of existing structures, unless authorized in writing by the <i>Departmental Representative</i> .
	.3	The use of existing wharf structures will not be permitted for dredging operations. Contractor must take all precautions to prevent damage to the structure.
	.4	If floating docks, gangway, and anchor blocks must be removed to accommodate dredging operations, all components must be reinstated to original location and condition following completion of dredging.
3.7 Cooperation and Assistance to <u>Departmental Representative</u>	.1	Cooperate with <i>Departmental Representative</i> on inspection work and provide assistance requested.
	.2	On request of <i>Departmental Representative</i> , furnish use of such boats, equipment, labour and materials forming ordinary and usual part of dredging plant as may be reasonably necessary to inspect and monitor work. Provide approved duty boat to transport inspectors to and from dredge, at beginning and end of each inspection shift. Inspection shifts will be 8 hours in duration. The duty boat must be of adequate size and power to operate safely in conditions encountered. It must be fitted

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with a sufficient number of approved life jackets and hard hats for inspection staff.

- .3 Provide adequate, weather-tight, heated work space for exclusive use by the *Departmental Representative* and inspection staff, on board the dredge or dredges used to carry out dredging under this contract. Equip with 1 X 2 m table, 3 chairs, one 3 drawer filling cabinet, and maintain in clean condition. The work space is to be for the sole use of the *Departmental Representative* and inspection staff. Work space shared with Contractor's staff will not be permitted.
- .4 Provide *Departmental Representative* or inspector with copies of, or access to, daily records of dredging activity, including areas dredged, type of material, scow measure of material dredged (daily and accumulated), hours of dredging, hours and reasons for downtime, and other information regarding dredging and disposal as requested by the *Departmental Representative*.
-