



**FRASER RIVER ESTUARY
MANAGEMENT PROGRAM
(FREMP)**

DREDGE MANAGEMENT GUIDELINES

REVISED 2005

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GLOSSARY

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| “Arms” of the Fraser River | <p>There are four “arms” of the Fraser River as shown on Map 1:</p> <ul style="list-style-type: none">• The “North Arm” running north of Sea Island from the trifurcation at New Westminster;• The “Middle Arm” running off the North Arm and flowing south of Sea Island;• The “South Arm” running south from the trifurcation at New Westminster; and• The “Main Arm” which carries all waters flowing from the region upstream of the New Westminster trifurcation. <p>The South Arm is often referred to as the “Main Stem” for navigational purposes.</p> |
| Authorization | Any document issued by the appropriate approval authority to undertake dredging. |
| Available Sand | The non-dredged volume of the allowable Sediment Budget for the lower Fraser River as established by the responsible agencies. |
| Coarse Sand | See definition under “ <i>Sand</i> ”. |
| Coordinated Project Review (CPR) | The process through FREMP whereby all development applications are reviewed in tandem by all appropriate regulatory agencies. |
| Deep Sea Channel | Length/width/depth of the deep sea channel as defined on the map(s) in this document. The portion of the lower Fraser River that is navigable by ocean-going vessels. |
| Dredging | Removal of sediment from the riverbed. |
| Estuary | The region in which fresh and salt water mix when a river meets the sea. |
| Fine Sand | See definition under “ <i>Sand</i> ”. |
| Gravel | See definition under “ <i>Sand</i> ”. |
| Lead Agency | In the context of dredging, the agency which has the responsibility for issuing dredging approvals in the estuary. In the Fraser River Estuary downstream of Kanaka Creek, the Agencies will be one of: the Fraser River Port Authority, the North Fraser Port Authority or Vancouver Port Authority. For areas upstream of the mouth of Kanaka Creek, the Agency will be BC Ministry of Environment. |
| Navigation Channel | Area between channel boundaries in any channel used for vessel traffic. |
| Regulatory Agency | A government department or agency that administers legislation and associated regulations. The federal, provincial and port authority partners in FREMP are all Regulatory Agencies. |
| Sand | <p>Material of a particular grain size that is deposited on the riverbed. The term “sand” is often used interchangeably with the term “sediment”.</p> <ul style="list-style-type: none">• In the Fraser River, “sand” (also referred to as “coarse sand”) is considered to be any material that has a grain size between 0.177mm and 2.00mm. In the FREMP area, the Sediment Budget measures deposits and removals of material between 0.177mm and 2.00mm.• Material larger than 2.00mm is referred to as “gravel”.• Material finer than 0.177mm is referred to as “fine sand” and/or “wash load”. |
| Sand Heads | Kilometre marker 0.0: the seaward end of the South Arm Navigation Channel. |

| | |
|------------------------|---|
| Sand Registry | A database located at the FREMP and Fraser River Port Authority offices, which contains a yearly record of the date and amount of coarse sand (see definition under “ <i>sand</i> ”) deposited and/or removed and/or redistributed within the river. |
| Sediment | A general term to describe all material deposited on the river bottom. “Sediment” may be composed of fine sand and/or coarse sand and/or gravel (see definition for “ <i>sand</i> ” above). |
| Sediment Budget | A measure of the net change in sediment stored in the river as a function of total inflow of sediment at Mission less the outflow into Georgia Strait. The Sediment Budget in any year represents the maximum permissible amount of material that may be removed from the estuary for any reason. In the FREMP area, the Budget measures deposits of material between 0.177mm and 2.00mm. |
| Wash Load | For the Fraser River, any sediment with a particle size smaller than 0.063mm. |

ACRONYMS

| | |
|-------|--|
| CCG | Canadian Coast Guard (Fisheries & Oceans Canada) |
| CPR | Coordinated Project Review |
| CSR | Contaminated Site Regulation |
| CWS | Canadian Wildlife Service (Environment Canada) |
| DFO | Fisheries and Oceans Canada |
| EC | Environment Canada |
| EMP | Estuary Management Plan |
| ERC | Environmental Review Committee (FREMP) |
| FREMP | Fraser River Estuary Management Program |
| FRPA | Fraser River Port Authority |
| MOE | BC Ministry of Environment |
| NFPA | North Fraser Port Authority |
| PWGSC | Public Works and Government Services Canada |
| RODAC | Regional Ocean Disposal Advisory Committee |
| WLUC | Water and Land Use Committee (FREMP) |

PART 1: INTRODUCTION

The Dredge Management Guidelines provide information on the FREMP Sediment Budget, the dredging application process, and the existing guidelines and regulations of agencies responsible for dredging in the Fraser River estuary. The Guidelines are intended to accommodate the need for continued navigation while maintaining the environmental integrity of the estuary.

THE FRASER RIVER

The Fraser River Estuary is a magnificent natural resource and is home to some of the most productive biological systems in the world. In addition, the river serves as an important marine transportation route for British Columbians and plays a key role in the economy of one of North America's fastest growing metropolitan areas.

THE FRASER RIVER ESTUARY MANAGEMENT PROGRAM AND THE ESTUARY MANAGEMENT PLAN

FREMP is a partnership among federal, provincial, and regional government bodies that has been established to foster coordinated and sustainable management of activities in the Fraser River Estuary (from Sandheads to Kanaka Creek and the mouth of Pitt Lake). FREMP was established in 1985 and is a partnership among:

- Fisheries and Oceans Canada;
- Environment Canada;
- the BC Ministry of Environment;
- the Fraser River Port Authority;
- the North Fraser Port Authority; and
- the Greater Vancouver Regional District.

The FREMP area of interest applies to the wetted side of the dyke and includes the Main, North, Middle and South Arms of the Fraser River downstream of Kanaka Creek, the Pitt River downstream of Pitt Lake, and the entire Outer Banks from Point Grey to the US Border. It also includes Boundary, Semiahmoo, and Mud Bays as well as the Serpentine and Nicomekl Rivers upstream to the sea dams on each river.

FREMP work is guided by the Estuary Management Plan (EMP), which was updated in 2003. Entitled *A Living Working River*, the EMP outlines a shared vision, goals, and action plan for improving the environmental and economic health of the Fraser River estuary. The plan was developed with input and support from a variety of stakeholders including private residents, industry, environmental groups, federal and provincial government agencies, First Nations and municipalities. It contains a number of tools—Area Designations, the Habitat Classification system, and the Coordinated Project Review Process—that enable FREMP partners to deliver on the goals and actions in the EMP. The EMP reflects a consensus among a broad range of stakeholders of how the water, shoreline and upland resources in the estuary should be managed.

The Estuary Management Plan (2003) contains an Action Program on Navigation and Dredging. A key objective of the Action Program is to “manage the removal of sediment from the river in a manner that balances with all the components of the sediment budget of the river system”.

THE RISE OF DREDGING AS AN ISSUE

In the late 1990s, with the continued demand by the shipping industry for navigation channel maintenance and the increased demand by the construction industry for dredged material, it became clear to agencies responsible for managing the Fraser River Estuary that better tools and practices for managing dredging were needed.

In 1996, the FREMP Water and Land Use Committee charged a Task Group to develop guidelines for dredging in the Fraser River estuary which accommodate the need for continued navigation (and the needs of the construction industry for sand, to the extent possible) while protecting the ecological integrity and sustainability of the estuary, as a means to deliver on the EMP target.

GUIDING PRINCIPLES FOR DREDGE MANAGEMENT

In scoping the issues associated with developing the Sediment Budget and reviewing existing guidelines, the Task Group used the following principles to guide their deliberations:

Dredging must be managed to ensure that:

- **habitat values and fishery resources are preserved.** This will involve continued habitat protection and enhancement throughout the estuary.
- **navigation channels are maintained** in such a way that reliable channel depths are available on a consistent basis to serve the evolving coastal and deep sea shipping markets. This will require a managed dredging program.
- **industry's demand for sand is met on an environmentally sustainable basis** This will require monitoring sediment inflow and controlling sand withdrawals on an annual basis in order to evaluate the effects of dredging and other development activities.
- **disposal of contaminated dredge material is properly managed and appropriate upland and offshore disposal sites are used.** Testing of dredge material for contaminants using defined testing procedures and standards will be needed to assess the impacts and fate of contaminants that may be found.
- **public health and safety needs are met.** This will require that all efforts are taken to maintain the structural integrity of utility crossings and river dykes.

TASK GROUP CONCLUSIONS

In order to better assess and manage dredging projects in the FREMP area of interest, the Task Group recommended that:

- Annual sediment budgets be established to guide dredging activities;
- Annual reports be produced describing the previous year's dredging activity (this requires the ability to track removals through a "Sand Registry"); and
- A technical group be made available to advise the FREMP ERC on the technical merits of any proposal, as needed.

The Dredge Management Advisory Committee oversaw the implementation of these tasks in the period 1999-2003, including development of the FREMP Sediment Budget described in Part 2. Program restructuring in April 2003 has meant that these tasks now fall to the FREMP Water and Land Use Committee, an advisory committee comprised of FREMP agency partners, municipalities, First Nations and other organizations. A technical group of dredging experts also meets to provide advice on dredging matters including the annual report on dredging activities.

PURPOSE OF THIS DOCUMENT

The purpose of this document is to:

- Provide a framework for managing sediment removals to work towards sustainability;
- Describe the FREMP Sediment Budget;
- Describe the FREMP Sand Registry; and
- Compile the guidelines and regulations of the agencies responsible for dredging in the Fraser River.

STRUCTURE OF THIS DOCUMENT

These Guidelines are intended to provide the dredging industry and others with information on the Sediment Budget and the existing agency guidelines for dredging in the Fraser River. The document is a technical companion to the *FREMP Comprehensive Dredging Strategy* currently being developed, which will look more broadly at the river's channel segments, port and dredging activities, and the status of environmental knowledge vis-à-vis dredging impacts.

The document is organized as follows:

Part 2..... the Sediment Budget, how it was developed, and how the volume of future dredging within the estuary will be determined;

Part 3..... the existing dredging application process and the types of information that are expected from dredging applicants; and

Appendices.... the existing guidelines and regulations of agencies responsible for dredging in Fraser River.

HOW THIS DOCUMENT WILL AFFECT DREDGING PROJECTS

The Sediment Budget process outlined in this document, when coupled with the existing guidelines found in the appendices to this document, moves FREMP partners a significant step towards the goal of balancing sand removals with the river's sediment budget.

This document does not change the existing agency guidelines (many of which are found in the appendices to this document) that have been developed by the various regulatory agencies involved in dredge management in the Fraser River. It merely establishes a process for setting the limit on how much material may be removed from the river. At some future date, regulatory agencies may develop additional guidelines governing dredging in order to limit habitat or other impacts associated with dredging.

The material contained in this report reflects a consensus among the regulatory agencies¹ regarding the general approach to dredging within the estuary. Individual projects, however, will continue to be reviewed on their own merits. Special exceptions to the Budget may be made for emergency navigation, health, or safety reasons.

¹ *The regulatory agencies are: Fisheries and Oceans Canada (Oceans, Habitat and Enhancement Branch); Environment Canada; Transport Canada (Navigable Waters Protection Division); the BC Ministry of Environment; the Fraser River Port Authority; and, the North Fraser Port Authority. The Canadian Coast Guard is not a regulatory agency; its Waterways program ensures that commercial shipping channels are designed and maintained in the best interests of safe navigation and public in general, that mariners are provided the necessary information to use the channels in a safe manner and that the channels are environmentally sustainable.*

PART II: THE FRASER RIVER SEDIMENT BUDGET AND SAND REGISTRY

WHAT IS A “SEDIMENT BUDGET”?

The Sediment Budget for the Fraser River Estuary is a measure of the net change in sediment stored in the river as a function of total inflow of sediment at Mission minus the outflow into the Strait of Georgia. The objective of the budget is to ensure that the average amount of sediment removed over a five- to ten-year period does not cause a net change of degradation in the riverbed that would have long-term impacts on the hydraulics of the river, reducing the river's capacity to transport sediment.

The FREMP Sediment Budget covers coarse sand-sized sediment in the estuary as far upstream as Mission. For the purposes of the Budget, “sand” is any material that has a grain size between 0.177mm and 2.000mm. All other materials are not considered in the Budget². Thus, the Sediment Budget represents the amount of sand within that range that needs to be removed in order to maintain a balanced riverbed from year to year.

The Sediment Budget is derived from a mathematical model prepared for FREMP in 1999 by Northwest Hydraulic Consultants (NHC), which was reviewed in 2002. NHC concluded that a sediment surplus has accumulated since 1996, and that the original target dredging figure of 70% of incoming bed material load is still appropriate and applies to grain sizes greater than 0.177mm. The report also recommended that the FREMP partners consider maintaining the sediment balance over the long term of ten years as there is less need for concern about individual years.

THE AREA THE SEDIMENT BUDGET COVERS

The Sediment Budget is calculated on the amount of coarse sand entering and depositing in the Fraser River below Mission. The amount of material that may be removed according to the budget is counted as a removal from the system regardless of where it is removed. Necessary data have not been analyzed to establish a budget for the North Arm. Further work will be required to develop a budget for this portion of the river.

Generally speaking, material may only be removed from the deep sea navigation channel downstream of the Patullo Bridge if the regulatory agencies are satisfied that no unacceptable adverse impacts will result. Material should also only be removed where it is actively deposited each year. Any proposed sand removal outside the deep sea navigation channel between Sandheads and Port Mann and any proposed removal in the North and Middle Arms or between Port Mann and Kanaka Creek³ will be reviewed through the FREMP Environmental Review Committee. FREMP will take into consideration the sand allocations for adjacent areas of the deep sea channel. Successful projects outside the deep sea channel will, as indicated above, be counted as withdrawals from the Sediment Budget and may change the amount of sand available for withdrawal in other reaches.

² Material smaller than this size does not generally deposit in the FREMP area in large quantities; material larger than 2.00mm (usually referred to as “gravel”) generally deposits upstream of the FREMP area of interest.

³ Upstream of Kanaka Creek the appropriate authority is the Ministry of Environment. FREMP is not usually involved in these applications. Any sediment removed upstream of Kanaka Creek must be authorized by the Ministry on a case-by-case basis. Such removals will be factored in when setting the downstream budget.

HOW THE SEDIMENT BUDGET IS DETERMINED

A sediment budget for any reach of the Lower Fraser River may be written as:

$$S_{out} = S_{in} - S_{dredge} + S_{spoil} - \Delta S_{channel}$$

Where :

| <i>Definition</i> | <i>Information Source</i> |
|--|--|
| $\Delta S_{channel}$ = the net change in channel storage of sediment expressed as bed accretion or degradation | To be determined from the annual River surveys. |
| S_{in} = sediment inflow to the study area | To be based on suspended sediment data records collected at Mission. The sediment outflow from one reach will be the sediment inflow to the next downstream reach. |
| S_{dredge} = the net mass of sediment dredged from the study area | To be determined from permits received and reported by project proponents. |
| S_{out} = the natural sediment outflow from the study area | To be calculated from the equation. |
| S_{spoil} = the quantity of material deposited or disposed of in the river | To be determined from permits received and reported by project proponents. |

The sediment monitoring station is at Mission. The predicted Sediment Budget will be calculated for the river each year with the objective of using the Budget to manage for the long-term sustainability of the river. The Budget period will be calculated on a calendar year but will be adjusted to reflect the fact that a “dredging year” extends from August of one year to March of the following year.

WHAT IS THE SAND REGISTRY AND WHAT IS ITS ROLE?

The Sand Registry is a database containing records of the amount of sand removed and/or added to the river each year. The MS Access database resides at the FREMP office. In 2002, the registry interface was updated and linked to the FREMP Geographic Information System (GIS). Annual database updates are undertaken through the FREMP office, based on data provided by the Fraser River Port Authority.

The Registry helps monitor dredging activity against the budget, in order to ensure that sediment removal remains within the river’s budget. The Registry is also used to periodically refine the dredging budget to ensure that the model continues to reflect the hydrological reality in the river. The Registry will occasionally be able to identify when excess sand may be available for use by various industries. An example of when this might occur would be a year in which above-average sedimentation occurs.

WHAT THE REGISTRY CONTAINS:

The Registry contains the following information:

- Actual amount of sediment removed;
- Date and location from which sediment was removed; and
- Date, location, and type of disposal used.

PART III THE APPLICATION PROCESS

DREDGING AND PROJECT REVIEW IN THE ESTUARY

Any project that has the potential to affect the Fraser River is already subject to the approval of a variety of regulatory agencies. For instance:

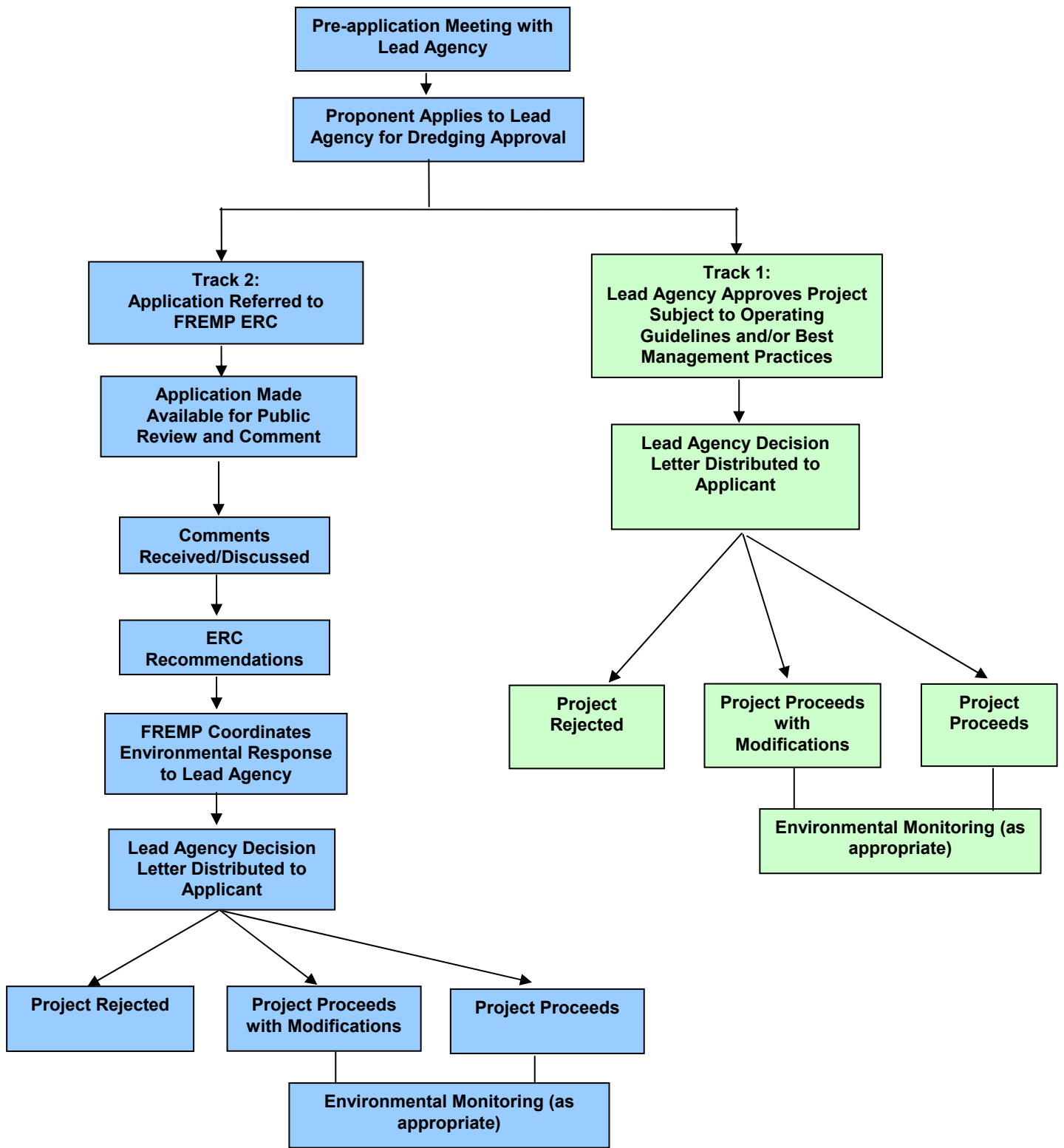
- Fisheries and Oceans Canada (Oceans, Habitat and Enhancement Branch) is responsible for ensuring that fish and fish habitat are protected.
- Transport Canada (Navigable Waters Protection Division) ensures that navigable waters are protected.
- Environment Canada regulates Disposal At Sea.
- BC Ministry of Environment is also responsible for ensuring that fish and fish habitat are protected and is responsible for regulating the environmental quality of sediments disposed on Crown and private land. The Ministry is also responsible for all upland, foreshore, and riverbed Crown Land, including issuing dredging approvals upstream of Kanaka Creek, and is responsible for tenuring disposal of sediment on Crown land.
- The North Fraser Port Authority and the Fraser River Port Authority are responsible for managing port activities, port properties, lands granted to them by the federal and provincial governments, channel maintenance, and issuing dredging approvals downstream of Kanaka Creek.

In the FREMP area of interest, any person or organization interested in undertaking a project that may have an environmental impact on the estuary must proceed through the Coordinated Project Review process.

The guidelines and regulations of agencies responsible for dredging in the Fraser River are found in the Appendices. During the Coordinated Project Review process the various agency representatives refer to these documents when assessing dredging proposals.

OVERVIEW

The flow diagram on the following page outlines the general application and environmental review process for dredging projects in the FREMP area. This process is discussed at greater length in the appendices. Lead Agencies are outlined in the glossary and in the appendices.



ENGAGING IN THE PROJECT REVIEW PROCESS

When applying for a dredging approval, the applicant must:

- 1) Fill out the “Coordinated Project Review: Dredging Application”, available at the Lead Agency and FREMP offices.
- 2) Submit completed application to one of three Lead Agencies: Fraser River Port Authority, North Fraser Port Authority, or BC Ministry of Environment. To determine the appropriate Lead Agency, see Appendix 1.

APPLICATION REQUIREMENTS

Depending on the nature and location of the proposed project, the Lead Agency will follow one of two procedures and require one of the two following sets of information:

Dredging in the Deep Sea Channel

In the FREMP area, the Fraser River Port Authority (FRPA) maintains the Deep-Sea Shipping Channel and must have dredging approval prior to any maintenance or capital dredging activity. A general environmental approval for dredging projects in the deep sea navigation channel may be held for a specified term.

When applying to dredge in these areas, FRPA must provide the following:

- the location to be dredged;
- the volume and type of material to be dredged; and
- hydrographic survey information for the period following the most recent freshet.

Additional information required may include biological impact and/or hydraulic assessments.

Post-Approval Requirements

Once a dredging project is approved by FREMP partner agencies through the ERC, FRPA is expected to meet environmental requirements and royalty payments as stipulated in the dredging approval. Exceeding the boundaries may be subject to penalties imposed by authorizing agencies. FRPA may be required to conduct post-dredge surveys to demonstrate compliance with approval requirements.

In either case, the proponent is responsible for:

- identifying, through the pre-application process, that a sustainable sand load is available for removal;
- demonstrating that the project meets the applicable guidelines intended to ensure mitigation of negative environmental impacts;
- ensuring that the material meets the applicable standards for transfer pit storage, upland use, and/or ocean disposal as required and obtaining applicable disposal permits (e.g. municipal soil deposition permit if the material is destined for upland disposal);
- ensuring that all necessary permits have been received prior to commencement of dredging;
- ensuring that dredging does not compromise the structural integrity of dykes, utility crossings and bridge abutments; and
- ensuring that municipal regulations regarding upland disposal and return-water routing are met.

Dredging Elsewhere

Any dredging proposal that is; outside the deep sea channel; destined for upland disposal sites; or destined for an unapproved transfer pit, will be subject to review by the FREMP ERC (which may also consult the WLUC). In these cases, following the FREMP environmental review, dredging approvals are issued by the Lead Agency.

For these projects, proponents may be required to provide additional information. This may include:

- pre-dredge hydrographic information;
- hydraulic information;
- habitat inventories; and/or
- contaminant studies

For these projects, it is also suggested that proponents meet with the Lead Agency and/or ERC prior to submitting an application (a “pre-application meeting”) to discuss the nature of the project.

Post-Approval Requirements

Post-dredge surveys may also be required. The timing of these surveys will be determined by the Lead Agency and ERC. Proponents must meet environmental requirements and royalty payments as stipulated in the dredging approval. A performance bond may be required to ensure satisfactory completion of dredging works.

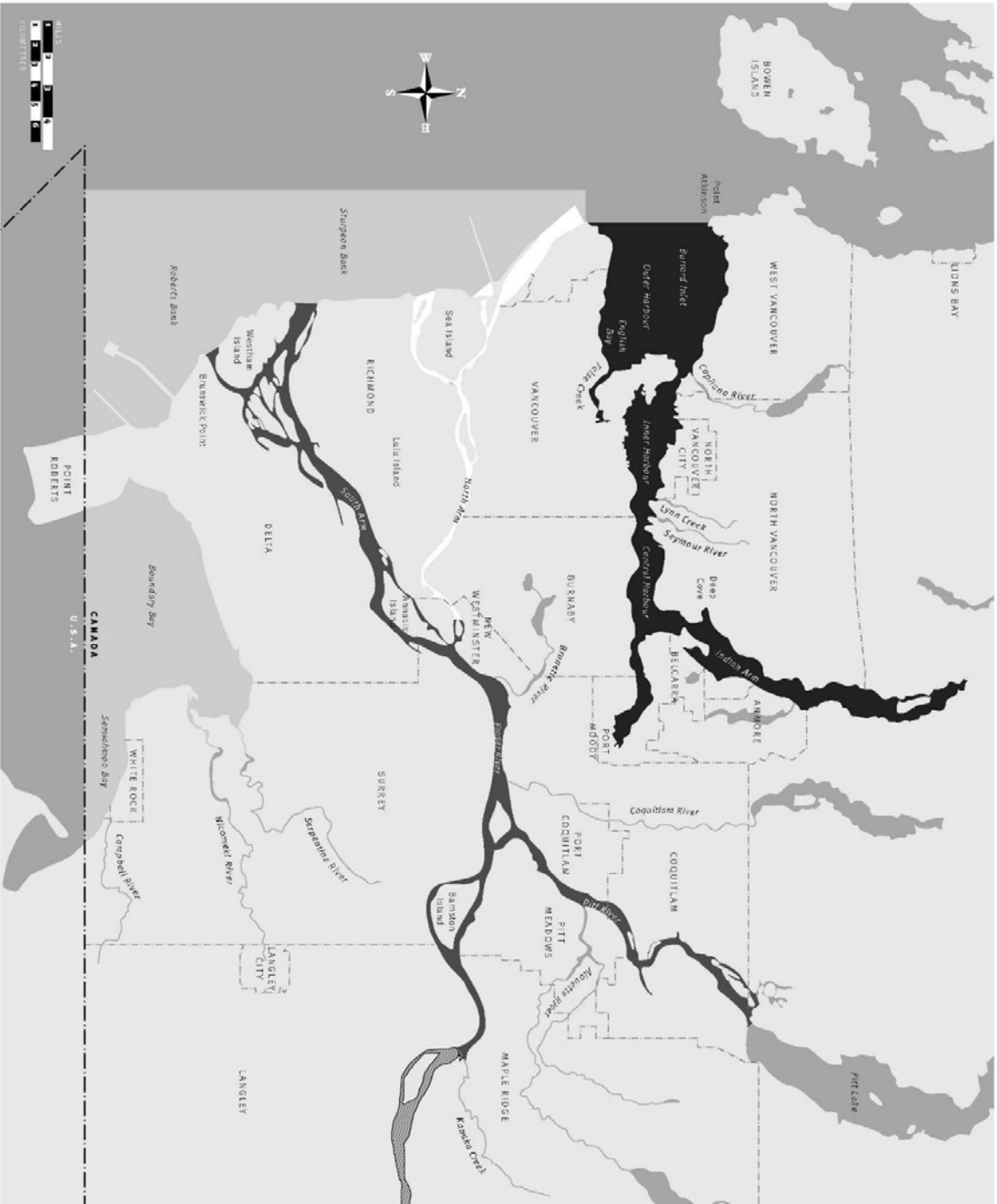
A list of relevant guidelines and requirements can be found in the Appendices as follows:

| Map/Appendix | Title |
|--------------|--|
| Map 1 | Agency Jurisdiction(s) |
| Maps 2 & 3 | Port Jurisdiction and Navigation Channels Map |
| Appendix 1 | Coordinated Project Review in the Fraser River Estuary |
| Appendix 2 | Environmental Dredging Guidelines for the Lower Fraser |
| Appendix 3 | Transfer Pit Operating Guidelines |
| Appendix 4 | Upland Disposal Requirements |
| Appendix 5 | Ocean Disposal Contaminants Testing Guidelines |
| Appendix 6 | Hydrographic Study Guidelines |
| Appendix 7 | Hydraulic Survey Guidelines |
| Appendix 8 | Future Habitat Inventory Requirements |
| Appendix 10 | WLUC Terms of Reference |
| Appendix 11 | Dredging Application Form |

MAP 1: AGENCY JURISDICTIONS

Map 1: Agency Jurisdictions

- Burrard Inlet Environmental Action Program
- Fraser River Estuary Management Program
- Fraser River Port Authority
- North Fraser Port Authority
- ▨ Province of British Columbia

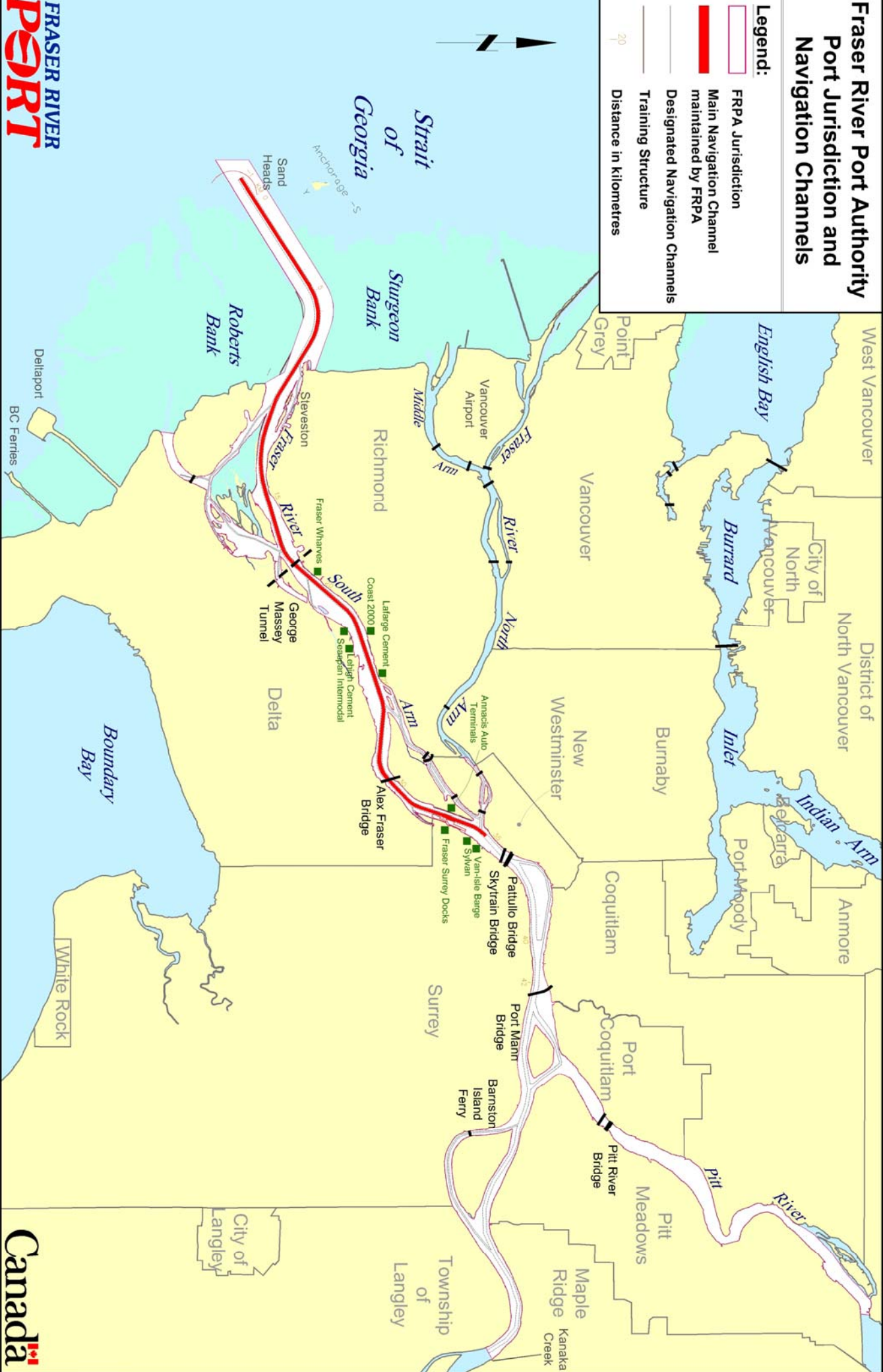


MAPS 2 & 3: PORT JURISDICTION AND NAVIGATION CHANNELS MAPS

(SOURCE: FRASER RIVER PORT AUTHORITY AND NORTH FRASER PORT AUTHORITY)

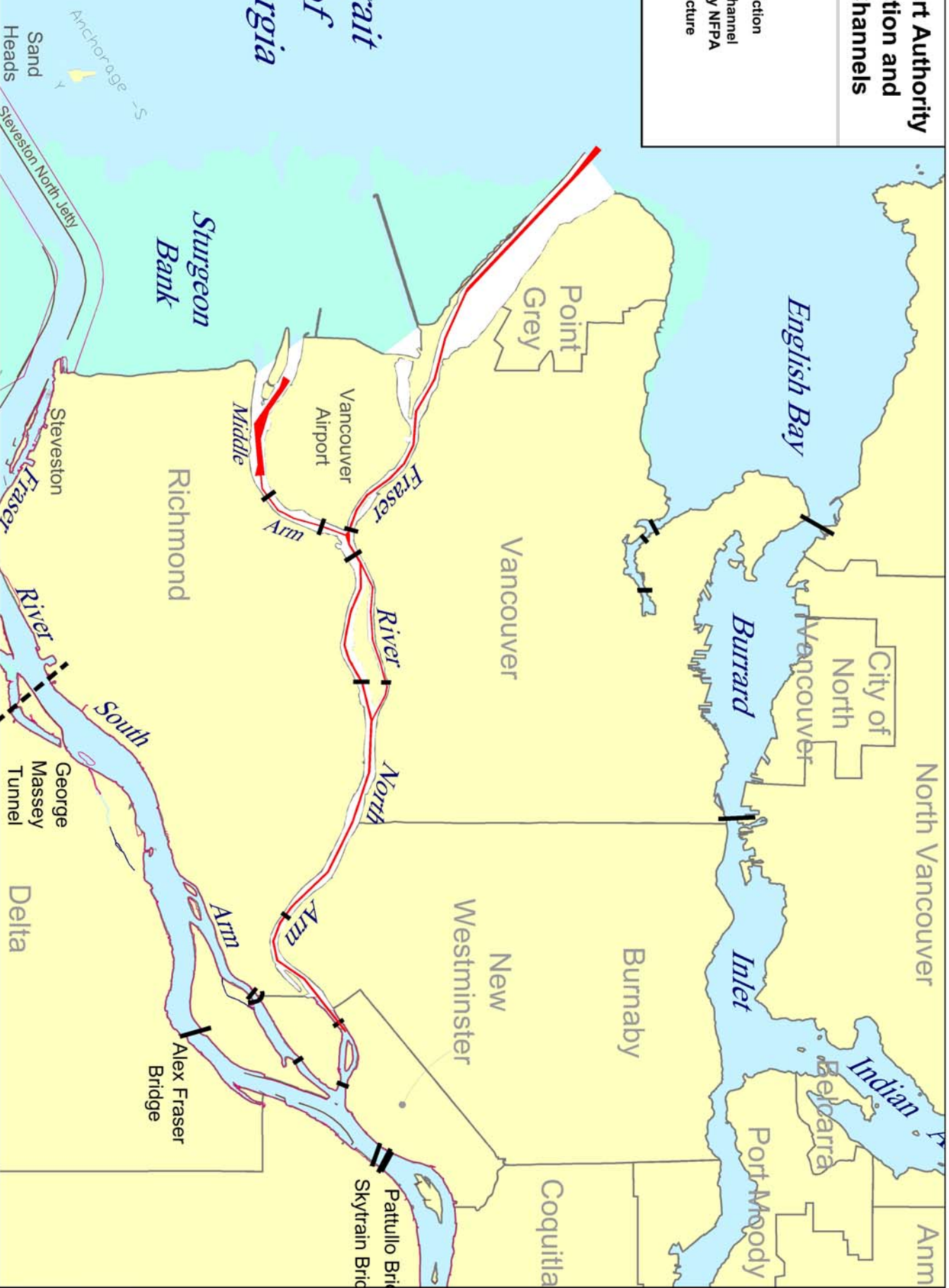
Fraser River Port Authority Port Jurisdiction and Navigation Channels

- Legend:**
- FRPA Jurisdiction
 - Main Navigation Channel maintained by FRPA
 - Designated Navigation Channels
 - Training Structure
 - Distance in Kilometres



North Fraser Port Authority Port Jurisdiction and Navigation Channels

- Legend:**
- NFPA Jurisdiction
 - Navigation Channel maintained by NFPA
 - Training Structure



APPENDIX 1: COORDINATED PROJECT REVIEW IN THE FRASER RIVER ESTUARY

(SOURCE: FREMP)

A process for project review in the Fraser River estuary has been established under the Fraser River Estuary Management Program (FREMP). Any project that has the potential to affect the surrounding environment must be reviewed by the Lead Agency or by referral to FREMP. Common examples are:

- dredging;
- maintenance works;
- moorage facilities;
- log storage;
- habitat development and restoration;
- shoreline protection works; and
- new structures.

Project Review Agencies

The FREMP Environmental Review Committee (ERC) is responsible for reviewing all projects referred to them from the Lead Agency. This committee is made up of representatives from:

- Environment Canada;
- Fisheries and Oceans Canada;
- BC Ministry of Environment;
- Transport Canada (Navigable Waters Protection Division);
- North Fraser Port Authority; and
- Fraser River Port Authority.

With FREMP staff support, the ERC reviews all referred project applications; considers all environmental comments for applicable applications; and compiles a coordinated set of recommendations. Neither FREMP nor its Environmental Review Committee are government agencies, and have no legal authority of their own. All responses by the ERC are founded on the authority of one or more of its member organizations.

Lead Agencies have been authorized to control the right to occupy or lease land or water lots not privately owned. These Lead Agencies serve as prime contacts with the proponent throughout the Project Review Process. Representatives of the Lead Agencies attend the bi-weekly ERC meetings to provide clarifications in order to expedite the review process. Representatives of municipalities may also periodically attend these meetings to discuss projects of concern to their communities.

Applications for new projects within the review area must be made to one of the following agencies: Fraser River Port Authority, North Fraser Port Authority, or the Ministry of Environment. The Fraser River Port Authority (FRPA) receives applications for any new development and/or maintenance projects occurring on land and water lots within the FRPA jurisdiction shown on the map on page 15. The North Fraser Port Authority (NFPA) exercises similar authority for its jurisdiction as shown on the same map. The Ministry of Environment has jurisdiction over all BC Crown lands. Some applications are referred to the FREMP Environmental Review Committee for environmental review and recommendation(s) prior to the Lead Agency making a decision.

The Updated Coordinated Project Review Process

The Burrard Inlet Environmental Action Program (BIEAP) and FREMP have adopted a three-phase, four-track process for the review of projects in Burrard Inlet and the Fraser River Estuary (see over).

PHASE 1 (PRE-APPLICATION): In the pre-application meeting, the appropriate Lead Agency, usually a Port Authority, works with the proponent to ensure a project proposal is developed with all the necessary environmental, related health and socio-economic information.

BIEAP and FREMP have developed a “Toolbox” to assist proponents in preparing project proposals and as a resource to aid Lead Agencies (see <http://www.bieapfremf.org/bieap/projectreview/toolbox.html>). The Toolbox includes:

- environmental quality guidelines and objectives,
- guidelines and information requirements for preparing applications
- current best management practices and operating guidelines
- Inlet and Estuary management plans
- habitat and resource inventories and maps, and
- regulatory requirements.

In certain circumstances, pre-application discussions with the Lead Agency and reviewing member agencies may be appropriate in facilitating the planning and design of the proposed project.

The Lead Agency assigns the project proposal to one of the four tracks depending on such factors as the uniqueness, size and likely adverse impacts of the project, the level of public interest/concern, and the sensitivity of fish/wildlife habitat.

PHASE 2 (PROJECT REVIEW): In this phase, the coordinated environmental review of the project takes place through one of four tracks as determined by the Lead Agency. Environmental reviews will be guided by the requirements of the *Canadian Environmental Assessment Act*, the *Canada Port Authority Environmental Assessment Regulations*, and/or the British Columbia *Environmental Assessment Act*, and other applicable legislation, guidelines and policies as appropriate.

TRACK 1: Track 1 is suitable for projects where operational guidelines and/or best management practices are already in place, adverse effects are unlikely, valuable habitat is not at risk, and public interest is limited. Track 1 projects are defined as those of a routine nature, usually in Green Coded Areas. Review of Track 1 projects is conducted by the appropriate Port Authority may consult with other BIEAP-FREMP partners at any time to access their technical or scientific expertise. Track 1 reviews are usually completed in four to six weeks, assuming the proponent has provided all the necessary information.

TRACK 2: Track 2 is suitable for projects where operational guidelines and best management practices are not in place, some adverse effects are likely, valuable habitat may be at risk, and public interest is anticipated. Track 2 projects are defined as those in Yellow Coded Areas. Review of Track 2 projects is conducted by the existing BIEAP and FREMP Environmental Review Committees, made up of representatives of all the partner agencies - the Environmental Review Committee. Track 2 reviews are usually completed in less than 30 business days, assuming that the proponent has provided all the necessary information.

TRACK 3: Few projects follow Track 3. Track 3 is suitable for projects where operational guidelines and best management practices are not in place, adverse effects are likely, valuable habitat is at risk, and public concerns are evident. The environmental assessment of a Track 3 project is conducted by a Task Force established specifically for that project by the BIEAP-FREMP Management Committee. Timelines for Track 3 assessments are established specifically for each Task Force.

TRACK 4: Rarely are projects expected to follow Track 4. Track 4 is for projects where environmental, social, economic, and/or public concerns are such as to warrant referral to a panel review or mediation under the *Canadian Environmental Assessment Act* and/or the British Columbia *Environmental Assessment Act*. In such cases, the projects are referred to the appropriate Federal and/or Provincial Environmental Assessment Agencies.

Completion of Phase 2

Phase 2 ends with a project review decision and a set of mitigation recommendations for the project which are directed to the Lead Agency or proponent, and the responsible authorities. Three possible decisions can be made following the project review process:

- With appropriate mitigation measures in place, the project is not likely to cause significant adverse effects. In this case, the project can proceed.
- Even with appropriate mitigation measures in place, it is possible the project will still cause significant adverse effects **or** it is felt that the significant adverse effects of the project might be justifiable **or** there are serious public concerns about the project. In this case, the project must be referred to a review panel or a mediator.
- Even with appropriate mitigation measures in place, the project is likely to cause significant adverse effects that cannot be justified. In this case, the project cannot proceed.

PHASE 3 (POST-REVIEW): In this phase, the project review decision, along with any mitigation recommendations, is transferred to the responsible authorities.

As part of Phase 3, the Environmental Review Committees of BIEAP and FREMP select a number of projects for follow-up evaluation and monitoring. Follow-up evaluation assesses the degree to which impact mitigation recommendations were incorporated into project decisions by Responsible Authorities and proponents, and follow-up monitoring assesses the degree to which environmental and related health and socio-economic effects are actually mitigated.

Also in Phase 3, the public file on the project is completed with the final updating and submission of information on the project proposal, the project review decision and mitigation recommendations, the project decisions proponent and Responsible Authorities, and the results of any follow-up programs, to the BIEAP-FREMP Public Registry on www.bieapfremf.org.

Where Can I Get More Information?

For information on the BIEAP-FREMP Coordinated Project Review process, contact the BIEAP-FREMP Project Review Coordinator at (604) 775-5195, visit the BIEAP-FREMP Office at 501-5945 Kathleen Ave in Burnaby, or visit the website at <http://www.bieapfremf.org>.

For assistance with project proposals:

- Burrard Inlet, Sturgeon Bank, Roberts Bank, and Boundary Bay areas contact Environmental Services at the Vancouver Port Authority at (604) 665-9080.
- Main Arm of the Fraser River area below Kanaka Creek, South Arm of the Fraser River and the Pitt River as far up as Pitt Lake contact the Fraser River Port Authority at (604) 524-6655.
- North and Middle Arms: contact the North Fraser Port Authority at (604) 273-1866.

APPENDIX 2: ENVIRONMENTAL DREDGING GUIDELINES FOR THE LOWER FRASER

(SOURCE: FREMP)

- 1) From March 1 to June 15, there shall be no dredging (clamshell or suction) of dredge material volumes greater than 4,000 m³ in order to protect juvenile salmonids and eulachon.
- 2) From June 15 to July 15, in the lower Fraser River Estuary⁵, there shall be no suction dredging in water which is less than five (5) metres deep at daily low water in order to protect juvenile salmonids.
- 3) Pumps for suction dredging shall not operate unless the suction-head is within one and one half metres (1.5 m) of the river bottom.
- 4) The works shall be conducted utilizing water-based machinery or equipment (e.g. boat, barge, etc.) firmly moored in deep water, far enough offshore to prevent any grounding onto the intertidal foreshore or riverbed of the Fraser River. The only exception is the use of vertical spuds or other anchors to keep the machinery or equipment firmly moored in place.
- 5) If the dredge and/or return water pipes will cross the foreshore of the Fraser River, please note the following requirements:

Upland Areas: The dredge and return water pipes are to be placed/removed in a manner that avoids the disturbance to upland trees and minimizes the disturbance to shrub and grass vegetation at the top of and on the river bank down to the high water mark (inclusive).

Intertidal Areas: The dredge and return water pipes are to be placed/removed in a manner that does not disturb any intertidal mud or sand flat or intertidal vegetation on the Fraser River foreshore.

- 6) The return water from any dredged material placed on the upland must be discharged directly into the Fraser River and the return water must be discharged via pipe that extends far enough offshore so that **the return water discharge is submerged or is below the river water surface at all times.**
- 7) Return water from any dredged material placed upland must be treated via settling basin such that the total suspended solids concentration of the return water is minimized prior to discharge to the Fraser River. The induced turbidity and generation of sediment-laden water during dredging is also to be minimized. In each case, reference should be made to the applicable water quality criteria as described in the British Columbia Water Quality Guidelines (Criteria): 1998 Edition produced by then-BC Ministry of Environment, Lands and Parks.
- 8) For upland placement of dredged material, the dredged material must comply with the BC *Environmental Management Act* and its regulations, such as the Contaminated Sites and Hazardous Waste regulations, and with appropriate municipal soil deposition permits. Should contamination of sediments be a possibility due to present or historical activities at, or adjacent to, the proposed dredging area, the MOE Contaminated Sites Program recommends assessment of sediment quality prior to dredging to ensure proper off-site management of dredged sediments. Section 55 of the *Environmental Management Act* and Part 8 of the Contaminated Sites Regulation should be referred to in conjunction with the results of any pre-dredge sediment quality assessment to determine whether a Contaminated Soil Relocation Agreement is required prior to commencing dredging. If site sediments are under provincial jurisdiction, the MOE Contaminated Sites Program recommends that results of in-situ sediment quality assessments be compared to the appropriate Contaminated Sites Regulation sediment quality criteria for marine and estuarine sediment. Further information is provided in Appendix 4 of these Guidelines.
- 9) If dredged material is intended for disposal at sea, approval from Environment Canada under the Disposal at Sea Regulations of the *Canadian Environmental Protection Act* (CEPA) is required. The

dredged material must also comply with the Environment Canada Interim Contaminant Testing Guidelines found in Appendix 5 of these Guidelines.

- 10) There should be no fuelling on or adjacent to the foreshore. All petroleum products (e.g., fuel, oil, lubricants), used should be stored and handled at an appropriate upland location and in compliance with all applicable legislation, guidelines, and Best Management Practices.
- 11) The proponent shall ensure that appropriate spill prevention, containment, and clean up contingency plans for hydrocarbon products (e.g. fuel, oil, hydraulic fluid, etc.), and other deleterious substances are in place prior to work commencing and that appropriate spill containment and cleanup supplies are kept available onsite whenever works are occurring. Further, all personnel conducting the works should be familiar with implementing the spill clean up plan and the deployment of spill response materials.
- 12) All works must be undertaken and completed in such a manner so as to prevent the release of substances deleterious to fish and other aquatic life onto the upland and/or intertidal foreshore of or into any watercourse or water body. The proponent is hereby reminded of its obligation to comply at all times with Section 36 of the Fisheries Act, which specifically prohibits the deposit of deleterious substances into fish bearing waters. Due diligence is required at all times to prevent such deposits, and adherence to the terms and conditions of this letter does not of itself relieve the proponent of this ongoing obligation.
- 13) Works shall be carried out in such a manner so as to prevent any adverse impact to fish or fish habitat. If the proposed works result in any such impact the Fisheries and Oceans Canada reserves the right to immediately suspend or alter operations and the proponent shall undertake, at their own expense, any compensatory and/or remedial works deemed necessary by Fisheries and Oceans Canada to ensure a no net loss of productive fish capacity.
- 14) The appropriate Fisheries and Oceans Canada Field Supervisor shall be contacted and advised at least five (5) days in advance of the start of the proposed works as follows

| For works located: | Contact: |
|---|---|
| Downstream of the Alex Fraser Bridge (Delta/Richmond) and Queensborough Bridge (New Westminster) | Fisheries and Oceans Canada Field Supervisor Steveston/Vancouver (Steveston) Phone: (604) 664-9250 |
| Downstream of CPR Rail Bridge (Mission) and upstream of Alex Fraser Bridge and Queensborough Bridge | Fisheries and Oceans Canada Field Supervisor Fraser Valley West (Langley) Phone: (604) 607-4150 |

- 15) It should be made clear to dredging applicants that non-compliance with the above guidelines could harm fish and/or fish habitat and accordingly, may be the subject of an investigation under the *Fisheries Act*.
- 16) Final determination of the applicability of the above guidelines is at the discretion of the FREMP Environmental Review Committee.

APPENDIX 3: FRASER RIVER PORT AUTHORITY TRANSFER PIT OPERATING GUIDELINES

(SOURCE: FRPA)

1. All transfer pits will be backfilled to nominal riverbed grades as determined by the Fraser River Port Authority.
2. Backfill material will be only sand supplied from channel maintenance dredging projects and/or approved transfer dredging sites. Sand quality must meet the Disposal at Sea requirements (see Appendix 5).
3. Backfill schedule of transfer pits will be within a 30 day period as per Fisheries and Oceans Canada Guidelines or as determined by the Fraser River Port Authority unless sufficient reason can be presented to the Port Authority and Fisheries and Oceans Canada to alter the specified period.
4. No transfer pit applications will be activated during high river flows (freshet conditions) above 5,000 m³/s Hope discharge.
5. Transfer pit dredging will be subject to FREMP Environmental Dredging Guidelines found in Appendix 2 of this document.
6. Methods of positioning and control of the backfill program must be submitted and approved by the Fraser River Port Authority.
7. Confirmation of backfill source and quantity must be provided to the Fraser River Port Authority before approval is granted.
8. Applicants must provide to the Fraser River Port Authority, upon completion of the transfer pit backfill operation, a bathymetric survey plan of the transfer pit area. The survey must be completed according to the Hydrographic Survey Guidelines in Appendix 6. The plan must be submitted to the Fraser River Port Authority within 30 days of completion of backfill operation.
9. Transfer pits that are proposed in critical or sensitive areas of the river as determined by the Port Authority will be subject to an independent river hydraulic study (see Appendix 7) by a recognized hydraulic engineering firm. A list of recognized firms in the Lower Mainland is available from the Port Authority.
10. In the event the Fraser River Port Authority is concerned that an applicant may fail to return the transfer pit to its original condition or may use questionable backfill, a performance bond may be required.
11. On completion of backfilling, the applicant will advise the Fraser River Port Authority. On receipt of notification the Authority will then advise interested agencies who will have 90 days to provide comments regarding the final condition of the site.

APPENDIX 4: UPLAND DISPOSAL REQUIREMENTS

(SOURCE: MOE)

The Province through the Ministry of Environment has responsibility for assessing and approving the upland disposal of dredge material. This section provides information on provincial upland disposal requirements.

A map is required that clearly indicates the area to be dredged and the accompanying text must note the amount of material to be removed, the method of removal, and potential current/historical sources of contamination in the vicinity of the work.

The number of samples required to characterize quantities of materials to be dredged is based on recommendations in the Environment Canada document “Interim Contaminant Testing Guidelines for Ocean Disposal Pacific and Yukon Region” dated March 2000 (see Appendix 5) as follows:

| Quantity (m ³) | Number of Samples Required |
|----------------------------|----------------------------|
| 0 - 5000 | 3 |
| 5000 - 20000 | 6 |
| 20000 - 100000 | 8 |

This intensity of sampling is intended to “screen” for contaminants and more intensive sampling may be required should contamination be suspected or encountered. It should also be noted that the samples obtained are expected to be surface sands and representative for the area to be dredged (i.e. sampling locations spaced across the dredge area). Should contamination at depth within the sands be suspected then sand core samples may be required.

Analytical tests performed on the sand samples should be done at the proponent’s laboratory of choice and at cost borne by the proponent. The results of these tests must be summarized in a Contaminant Testing Report and submitted to MOE. Tests should be chosen to reflect potential contamination from local sources. For screening purposes it is suggested that a metals package test (analyzes for about 20 metals) and a hydrocarbon test (EPHs – extractable petroleum hydrocarbons - and PAHs, as applicable) be done. Other tests, such as for antisapstain chemicals as may be used at sawmills or wood treatment chemicals as may be used at wood treatment facilities, may be required depending on sources of contamination in the vicinity of the area to be dredged.

The question typically being asked is whether the material being dredged is suitable for disposal onto land. The indicated sand quality is evaluated against the numerical standards for a specific land use as defined in the Contaminated Sites Regulation (CSR). By these values and land use it is determined whether the material is suitable for placement in upland areas. Municipal agencies should be consulted to ensure that the material is consistent with municipal zoning and Official Community Plan designations. In some cases, municipal soil deposition permits may be required.

Proponents should refer to the CSR Technical Guidance documents titled *Site Characterization and Confirmatory Testing* and *Statistical Criteria for Characterizing a Volume of Contaminated Material* for MOE guidance on collection of site characterization information. Site characterization may entail completion of a Preliminary and/or Detailed Site Investigation which should be complete by a qualified environmental professional. Further, proponents seeking to deposit sediments to the uplands need to be aware of the CSR standards in Schedules 4, 5, and 10 of the CSR and must obtain a Contaminated Soil Relocation Agreement if the sediments are to be moved off site and exceed limits in Schedule 7 of Schedule 10 of the CSR. Where sediment contamination is identified, the CSR should be consulted for determination of any other requirements that may apply.

APPENDIX 5: INTERIM CONTAMINANT TESTING GUIDELINES FOR DISPOSAL AT SEA, PACIFIC AND YUKON REGION

(SOURCE: EC -- MARCH 2000)

In response to growing concern over the biological implications of contaminants in marine sediments along the Canadian coastline, Environment Canada (EC), Pacific and Yukon Region, in consultation with the Regional Ocean Disposal Advisory Committee, has developed the following guidelines for sampling, analysis and reporting associated with proposed ocean disposal activities.

Under Schedule 6, (Assessment of Waste or Other Matter) of the *Canadian Environmental Protection Act* (CEPA), EC and permit applicants must consider the availability of practical alternate disposal options. To satisfy this requirement the applicant must provide a written record of the decision-making process used in selecting ocean disposal as the alternative of choice for disposal of materials. Disposal at sea is only permitted for materials where it is the environmentally preferable and practical alternative.

To assess the potential for environmental impacts of ocean disposal, EC requires chemical analyses to be performed on any material where there is a lack of chemical data, or a reason to believe that contaminants such as selected trace metals or organics are present. Guidance for the number of samples required may be obtained through Environment Canada's Regional Disposal at Sea Offices. A proposed sampling program should be developed by the applicant, based on information provided in the following tables, and submitted to the appropriate Regional Office for approval prior to commencement of loading or ocean disposal activities.

Materials found to contain substances of concern at, or higher than, the regulated or guideline concentrations identified in the following tables may be considered for ocean disposal under CEPA, Schedule 6. A substance may be considered for ocean disposal if tests show that it can be disposed at sea so as not to cause acute or chronic effects on marine organisms or human health, whether or not arising from their bioaccumulation in marine organisms. A tiered assessment approach using biological testing is used for this determination. Ocean disposal options such as capping, containment, and side-casting will be considered by EC, but their acceptance will be conditional on compliance Schedule 6.

SAMPLING AND ANALYSIS REQUIREMENTS

The following pages identify the minimum sampling and analytical requirements for dredged and excavated materials based on the size of the project, as well as rejection/screening limits currently used by EC. Sampling requirements will be tailored on a site specific basis at the discretion of EC, and analysis of other parameters may be requested when EC has reason to believe that other contaminants are present.

MINIMUM REQUIREMENTS FOR DREDGED MATERIAL

Sampling Requirements

The following are the minimum sampling requirements for disposal of dredged material. Additional guidance may be obtained from the *Users Guide to the Application Form for Ocean Disposal* (Report EPS 1/MA/1, 1995) available from Regional Disposal at Sea Offices. Projects involving disposal of less than 4,000 cubic metres of material resulting from maintenance dredging are eligible for disposal under a valid general permit (Pacific and Yukon Region).

Parentheses indicate the number of composite samples to be analyses initially for dioxins/furans, if requested by EC.

Table 1. Minimum sampling requirements for dredged material.

| Project Quantity | Permit Type | # of Samples | Type of Sampling |
|--------------------------------|--------------------|---------------------|---|
| 0 - 4 000 m ³ | General | 3 (1) | Surface sampling prior to loading. |
| 0 - 10 000 m ³ | Site-Specific | 6 (1) | Surface sampling prior to loading. |
| 10 001 - 30 000 m ³ | Site-Specific | 5 (1) | Surface sampling prior to loading. |
| | | 4 (1) | Sampling to depth prior to loading. |
| OR | | | |
| 10 001 - 30 000 m ³ | Site-Specific | 9 (2) | Surface sampling prior to loading. |
| 30 001 - 60 000 m ³ | Site-Specific | 5 (2) | Surface sampling prior to loading. |
| | | 5 (2) | Sampling to depth prior to loading. |
| > 60 000 m ³ | Site-Specific | | Sampling requirements will be determined on a project specific basis. |

Should the site history reveal cause for environmental concern, an increased number of samples and/or analysis of additional metals and/or organics may be requested.

Analysis Requirements

Details of minimum analytical requirements may be obtained through Environment Canada’s Regional Disposal at Sea Offices.

Table 2. Minimum analysis requirements for dredged material.

| | Parameter | Limit of Detection |
|---------------------|----------------------|---------------------------|
| Trace Metals | Mercury | 0.2 mg/kg |
| | Cadmium | 0.2 mg/kg |
| Organics | PAH | 0.1 mg/kg |
| Other | Total Organic Carbon | |
| | Particle Size | |

For Polynuclear Aromatic Hydrocarbons (PAH), the analytical methodology and quality assurance protocol must conform to that outlined in the *Interim Quality Assurance Guidelines for Determination of Polynuclear Aromatic Hydrocarbons in Marine Sediments for Ocean Disposal*, a copy of which is available from EC.

For dioxin/furan, the analytical methodology and quality assurance protocol must conform to that outlined in the *Internal Quality Assurance Requirements for Analysis of Dioxins in Environmental Samples*, a copy of which is available from EC.

The analysis results are to be reported on a dry weight basis with detection limits less than or equal to those stated above. The precision of the test method should be indicated by reporting analyses on five replicate sub-samples on 10% of the trace metal samples, and two replicate sub-samples on 20% of the organics samples, with a minimum of one replicated sample. Sub-sampling should be done following homogenizing but prior to digestion of the sample and the replicates should not be run consecutively. The accuracy of the test method should be indicated by reporting the results of certified reference materials analyzed at the same time as the test samples.

REJECTION/SCREENING LIMITS

Material found to exceed the following regulated and guideline limits will not be considered for ocean disposal unless tests show it can be disposed at sea within the criteria established under Schedule 6, *Canadian Environment Protection Act*.

Environment Canada may impose more stringent limits if the site history indicates cause for environmental concern.

Table 3. Rejection/screening limits for ocean disposal.

| Parameter | Rejection/Screening Limit |
|---|----------------------------------|
| Cadmium | 0.6 mg/kg dry weight |
| Mercury | 0.75 mg/kg dry weight |
| Chlorophenols (PCP) (penta and tetra isomers) | 1.0 mg/kg dry weight |
| Polychlorinated biphenyls (PCB) | 0.1 mg/kg dry weight |
| Total PAH | 2.5 mg/kg dry weight |
| Dioxin/Furan | “Quantifiable” 2,3,7,8 TCDD |

Steps Required for Collecting Samples and Submitting Analytical Data

The applicant is required to prepare the following information to be included with the proposed sampling program:

- 1) A location map for the dredge site with the street address of the proposed excavation or dredge site;
- 2) A site map showing the proposed dredge site relative to known landmarks and/or streets;
- 3) A list of any known possible contaminant input sources in the vicinity of the proposed works;
- 4) A written record of the decision making process used in selecting ocean disposal as the preferred materials disposal option, explaining why other disposal methods are not being used;
- 5) A site use history for the site from which the material destined for ocean disposal will originate; and
- 6) A proposed sampling plan of the site showing the proposed sampling locations, and a list of proposed analyses. The proposed sampling plan should be developed based on information presented in this document and the *Users Guide to the Application Form for Ocean Disposal*. Assistance in designing a sampling program can be provided by Environment Canada. The sampling program must be approved prior to taking the samples.

The information identified above should be sent to EC. If the project does not qualify for completion under the terms and conditions of a general permit, this information should be submitted with a completed ocean disposal application. For information on how to apply, please contact EC.

If the project qualifies for completion under a general ocean disposal permit, this information must be submitted to EC with a covering letter describing the proposed activities in detail, and the proposed schedule for the work. Upon completion of the sampling and analyses program, the test data, together with all QA/QC data as identified in the foregoing information, must be sent to EC.

No work may proceed under a general permit until written approval for the specific site has been received from EC, and a copy of the approval letter is posted at the work site.

For further information on this document, or any other matter relating to the Disposal at Sea Program, please contact Environment Canada.

GENERAL GUIDE TO SOIL AND SEDIMENT SAMPLE COLLECTION

Containers for the samples should be obtained from the laboratory contracted to conduct the required analyses. Avoid unnecessary contact with clean glassware and utensils. A clean stainless steel or teflon spoon or scoop is ideal for transferring samples. Handle containers by the outsides only. Do not touch the inside of the jar, or teflon (or foil) liners, and use spoons or scoops by the handles only. When removing a foil or teflon liner and lid from a jar, remove as one piece and put down on a piece of foil or other clean surface while filling the jar.

If using a grab sampler, remove the water from the surface of the grab, taking care not to disturb the contents if possible. Use the clean scoop to remove a portion of the sediment from the middle of the sampler down to the depth of the material caught in the grab. The material in the sample jar should be representative of the material to be loaded for ocean disposal.

Alternatively, the sample may be taken by removing the lid, holding the jar by the sides and scooping the sample from the sediment without the use of other utensils. The threads of the jar may then be wiped with a paper towel before replacing the lid. Do not fill the jar more than about 3/4 full, allowing plenty of room for mixing/stirring, and expansion during freezing. When the sample is in the jar, replace the teflon/foil liner and lid, and label the jar with project identification, sampling site number and sampling date.

To clean the sampling spoon or grab in between samples, wipe with a paper towel to remove any solids, then rinse with water. Clean the tray in this manner as required.

If three samples are required for analysis, three small jars of sediment should be taken for each sampling station, for a total of nine jars. The three jars per sample will be composited by the analytical lab by taking equal aliquots of sample from each jar for a single analysis of most parameters of concern. The samples may be further composited for other testing as required but would otherwise be maintained as discrete samples.

Keep the samples in a refrigerator or on ice for short term storage (1-2 days); freeze the sample as soon as possible or store over dry ice for long term storage. The laboratory responsible for the analyses should be asked to freeze the samples after removal of sufficient material to complete the required analyses. These samples should remain frozen until the permit, or approval under a general permit, has been issued by EC.

APPENDIX 6: FRASER RIVER HYDROGRAPHIC SURVEY GUIDELINES

(SOURCE: FRPA)

Accuracy

Horizontal:⁴ ± 3 metres NAD83 grid; Vertical: ± 0.1 metre / 10 cm to LLWL

Coverage

Density of Soundings: Minimum 50 metre cross line spacing with soundings every 20 metres.

Longitudinal Check Lines: Minimum of two longitudinal check lines at a suitable spacing should be run through the length of the area to confirm the accuracy of the cross lines. These lines should extend at least one third of the length of the area beyond the upstream and downstream boundaries of the area to track potential migration.

Survey coverage should always address the potential impact of side slope stability from the dredge cut to structures and environmental concerns.

Calibration of Equipment

All positioning equipment shall be field calibrated so that the deviation of the calibrated value shall not exceed the least count of the equipment system.

Echo sounder calibration: Prior to the commencement of a survey project, the echo sounder and transducer shall be calibrated for draft and the system bar-checked. The bar-check should be performed in the vicinity of the intended survey and repeated as required. Velocimeters can be substituted for bar-checks with requirements as per bar-check guidelines.

Data Presentation

When possible, the chart scale shall be 1:2000 using PWGSC base plan format. Soundings are in metres relative to LLWL with negative values representing elevations above Low Water Datum. The Local Low Water Datum used to reduce the sounding data is to be noted on the drawing. The horizontal datum (e.g. NAD83, local grid or selected reference points) as well as projection used (UTM) will also need to be noted on the drawing. Other information required would be project title, date of survey, survey personnel, site location, water level reference points and other pertinent information.

⁴ Horizontal positioning can be referenced to a local grid or identified control points if UTM grid is not practical or available.

APPENDIX 7: FRASER RIVER HYDRAULIC STUDY REQUIREMENTS

(SOURCE: LEAD AGENCIES)

This section outlines requirements for conducting hydraulic studies for the purposes of assessing Dredging Applications. These Terms of Reference are intended to establish consistent modeling methodologies and practices when using hydraulic models to assess impacts of dredging proposals. This should assist with expediting the review process of the study and assessment of the dredging application.

It is suggested that proponents or their consultants contact the Lead Agency before initiating hydraulic studies to discuss details of the study methodology. This would ensure that the information requirements are established for the technical review of specific dredging proposals.

The following outlines details of hydraulic study requirements:

Study Methodology

The study must include an assessment of impacts to the local and downstream Fraser River hydraulic characteristics that may occur from conducting the dredging.

Impacts to the following hydraulic characteristics to be considered:

- Local water levels
- Local flow velocities
- Sandation, Deposition/Accretion Patterns (local and downstream)
- Shoreline/Foreshore Erosion (local and downstream)
- Undermining of existing local marine structures.

Model Used

Consultants are not limited to any specific model, but the model must be capable of providing water surface elevations, velocities, and erosion / accretion information at sufficient scale (or grid size) to quantitatively assess the impacts of the dredging using varying flow conditions.

Calibration

Hydraulic models must be calibrated using historic prototype site information from existing records (unless consultants are obtaining new field data for calibration purposes). Available velocity and hydrographic survey records can be obtained from websites of Environment Canada (<http://scitech.pyr.ec.gc.ca>) and Coast Guard (<http://www.pacific.ccg-gcc.gc.ca>). The model must show similarity of hydraulic characteristics of pre and post freshet conditions to prototype records to establish reliability.

Model Extents

Model area to be sufficient for assessing local and downstream impacts. Upstream area to be sufficient for ensuring model stability of flow.

Surveys

Hydraulic model must use current hydrographic survey data for baseline condition (e.g. taken since previous freshet).

Boundary conditions

Must use appropriate boundary conditions such as those provided from Institute of Ocean Sciences and/or Canadian Hydrographic Service for calibration and assessing varying flow scenarios and their impacts.

Flow conditions

Impacts of the proposed dredging must be assessed for low, average, and higher than average conditions to establish the range of potential impacts.

Report

Report must be provided outlining the following:

- Study methodology
- Model description
- Calibration process
- Modeling program
- Quantitative assessment of impacts on hydraulic characteristics
- Summary

Study requirements established in this document are considered to be a minimum. Depending on the specific dredging location and extent, more information may be required to conduct an assessment of the dredging.

APPENDIX 8: POSSIBLE FUTURE HABITAT INVENTORY REQUIREMENTS

(SOURCE: FREMP)

Proponents may, in future, be required to provide some or all of the following information in order to allow the Environmental Review Committee to better assess the impacts of dredging:

Physical Information

- Bathymetry and river velocity information measured before and after dredging.

Biological Information:

- Suction dredge entrainment in the river
- Fish species presence/absence
- Population assessments of species utilizing dredge site and adjacent areas
- Substrate sampling for benthic invertebrate composition
- Larval fish surveys (species may include sturgeon and eulachon)

Note that different sampling may be required depending on whether a proposed project is inside or outside the deep sea channel, inside or outside channel thalweg, or dredged annually or dredged infrequently.

A number of dredging impact studies are ongoing in the Fraser River estuary, the findings of which may be extrapolated and considered in the context of dredging applications and potential impacts.

APPENDIX 9: WATER AND LAND USE COMMITTEE TERMS OF REFERENCE

Background

The Fraser River Estuary Management Program (FREMP) is an intergovernmental partnership to coordinate the environmental management of the Fraser River estuary. The primary policy and action document guiding the partnership is the Estuary Management Plan. Updated in 2003, the Estuary Management Plan contains a vision and goals for a “living, working river”, as well as seven Action Programs to guide the activities of the FREMP partners and others who play a role in managing the estuary. The responsibility of the FREMP Water and Land Use Committee is to recommend priorities to achieve the Plan’s objectives and monitor those actions.

Role of the Water and Land Use Committee

The Water and Land Use Committee (WLUC) will be responsible for coordinating the implementation of the Estuary Management Plan (EMP). This will include:

- Developing an annual workplan (based on the programs’ annual Workplan and Budget) that establishes priority actions to be undertaken each year, identifies which partners will lead or be responsible for the actions, and identifies sources of funding to carry out the actions;
- Monitoring, evaluating and reporting to Management Committee on the progress of EMP implementation; and
- Annually reviewing the status of priorities and identifying emerging priorities.

The WLUC is an advisory committee that reports to the BIEAP-FREMP Management Committee and makes recommendations subject to the approval of the Management Committee. The Management Committee provides overall direction to the Water and Land Use Committee, and approves the annual WLUC workplan based on the BIEAP-FREMP Five-Year Business Plan and annual Workplan and Budget.

Committee Membership

WLUC members include FREMP partners, the twelve municipalities in the FREMP area, First Nations, and related organizations and agencies. All members receive meeting packages and regular updates, and are invited to attend meetings and provide input.

- Ministry of Environment
- Environment Canada – Canadian Wildlife Service
- Environment Canada – Georgia Basin Action Plan (GBAP)
- Fisheries and Oceans Canada – Oceans, Habitat and Enhancement
- Canadian Coast Guard (Fisheries and Oceans Canada)
- Greater Vancouver Regional District – Policy and Planning
- Greater Vancouver Regional District - Parks
- Fraser River Port Authority
- North Fraser Port Authority
- Vancouver Port Authority
- Public Works & Government Services Canada
- Ministry of Agriculture, Food and Fisheries
- Vancouver International Airport Authority
- City of Burnaby
- City of Coquitlam
- City of New Westminister
- City of Port Coquitlam
- City of Richmond
- City of Surrey
- City of Vancouver
- City of White Rock
- Corporation of Delta
- District of Maple Ridge
- District of Pitt Meadows
- Township of Langley
- Katzie First Nation
- Musqueam First Nation
- Tsawwassen First Nation

The Committee Chair will be appointed by the BIEAP-FREMP Management Committee.

Committee Support

The BIEAP-FREMP Manager/Policy Coordinator will provide secretariat support to the Committee, including scheduling meetings, preparing agendas, maintaining linkages with Committee members, and monitoring and reporting to the Committee on Plan actions undertaken by others. Contracts may be issued to support Plan implementation activities based on the annual work plan.

Meeting and Reporting Schedule

The WLUC meets quarterly on the second Thursday morning of the month, beginning in May. Meetings are held in May, September, November and February.

The Chair reports to the Management Committee on WLUC activities as required and not less than twice yearly, as follows:

| Timing | Nature of Report |
|-------------------|---|
| March/April | Workplan for the upcoming year (for approval) |
| September/October | Progress report on workplan implementation |

APPENDIX 10: DREDGING APPLICATION FORM

COORDINATED PROJECT REVIEW DREDGING APPLICATION

APPLICATION INFORMATION

REGULATION:

The purpose of the application is to facilitate the approval process of proposed dredging projects within the Fraser River Port Authority's jurisdiction. All projects must meet the regulations within;

1. Canada Marine Act
2. Canadian Environmental Assessment Act
3. Canadian Environmental Protection Act
4. Federal Fisheries Act

ABOUT THE FORM:

1. The Dredging Application is designed to provide basic information required by most regulatory agencies responsible for reviewing proposed dredging projects within the Fraser River Estuary.
2. Certain agencies may require additional/specific information not contained in this form. If so, the applicant will be notified.
3. Each section contains detailed instructions, which will assist in completing the application. Please contact the FRPA office at (604) 524-6655 or e-mail at fraserport@frpa.com if you require additional information.

REQUIRED ATTACHMENTS:

1. **Application Fee** - An Application Fee of \$214.00 (taxes included) must be submitted with the Dredging Application. Payment can be paid in cash or by cheque (payable to the "Fraser River Port Authority"). Review of the proposed project will not commence until the Port Authority receives the Application Fee.
2. **Letter of Riparian Consent** - A Letter of Riparian Consent from the upland owner must accompany the application for proposals located adjacent to the shoreline. The Riparian Consent letter is required to ensure the upland owner has granted permission for the proposed works to take place.
3. **Sketch/Drawing** - A sketch/drawing of the proposed dredge area should accompany the application
4. **Sediment Analysis** - The sediment analysis is required to allow an appropriate environmental assessment of the dredging project.

APPLICATION PROCESS & DREDGING APPROVAL :

1. The Dredging Application review time varies depending on the potential environmental impacts of the proposed dredging project. If the dredging project is routine and impacts are minimal, such as annual maintenance dredging at mill sites, the application will be assessed internally at the Port within 4 to 6 weeks. If the proposed dredging project has the potential for a greater environmental impact; the application will be submitted to the Fraser River Estuary Management Program (FREMP), for review by the Environmental Review Committee (ERC). The final FRPA approval for projects referred to FREMP can take up to 6 to 8 weeks. Further delay may result if the application is incomplete or additional information is required.
2. The FRPA Decision Statement letter grants approval for the dredging project providing the applicant adheres to all clauses within the letter. The project must be carried out as described within the application. Any and all changes must be reported immediately to FRPA. Please note the Decision Statement letter may contain additional requirements of other agencies. It is the applicant's responsibility to ensure all requirements are carried out.

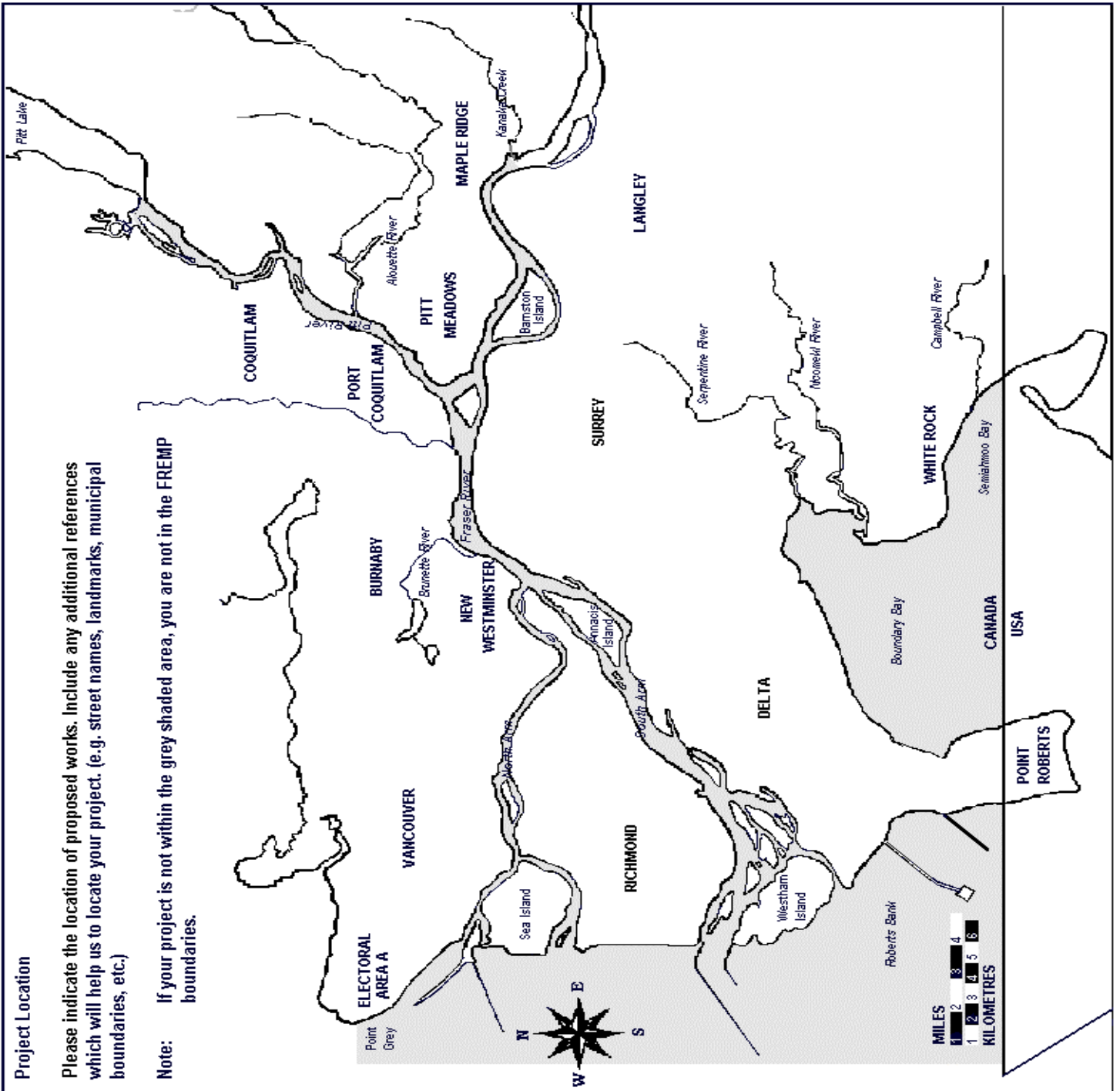
COORDINATED PROJECT REVIEW DREDGING APPLICATION

| | | | | |
|---|--|------------------------------------|--------------------|--|
| TYPE OF APPLICATION: | <input type="checkbox"/> NEW <input type="checkbox"/> RENEWAL <input type="checkbox"/> OTHER | If other, please explain: | | |
| APPLICANT | | | | |
| <i>May be an individual or registered company. Normally the Applicant is the tenant, however the Applicant may be a consultant, contractor, engineer, surveyor or lawyer. The Contact Name is the individual at the company making the application who can supply information on the project.</i> | | | | |
| Applicant Name: | Telephone: | Cellular: | Fax: | |
| Contact Name (if company): | | E-Mail Address: | | |
| Mailing Address: | City: | Province: | Postal Code | |
| DREDGE SITE | | | | |
| <i>Provide specific information regarding the site where the dredging is to take place</i> | | | | |
| Name of Tenure Holder: | Telephone: | Cellular: | Fax: | |
| Contact Name (if company): | | E-Mail Address: | | |
| Mailing Address: | City: | Province: | Postal Code | |
| Site Address: | | City: | | |
| Waterlot Purpose: | Reach/Channel Name: | Local Name: (If Applicable) | | |
| Upland Owner: | Telephone: | Cellular: | Fax: | |
| Contact Name (if company): | | E-Mail Address: | | |

COORDINATED PROJECT REVIEW DREDGING APPLICATION

LOCATION MAP

Indicate with an arrow the location of your project and include any information, which will help locate the project (eg. street names, permanent structures, landmarks).



COORDINATED PROJECT REVIEW DREDGING APPLICATION

PROPOSED DREDGING

| | | |
|------------------------------------|---|--|
| DREDGE METHOD | <input type="checkbox"/> Clamshell <input type="checkbox"/> Trailing Suction Hopper <input type="checkbox"/> Cutter-Suction | <input type="checkbox"/> Propwash (see note 1 below) <input type="checkbox"/> Bed-Level <input type="checkbox"/> Other |
| DISPOSAL METHOD | <input type="checkbox"/> Ocean Disposal | Permit Holder Permit Number Max. Permit Volume Expiry Date |
| | <input type="checkbox"/> In-River Disposal (See note 2 below) | Disposal Site Unloading Method |
| | <input type="checkbox"/> Upland Disposal | Disposal Site Prov/Muni. Permit # |
| | <input type="checkbox"/> Habitat Compensation | Habitat Site |
| | <input type="checkbox"/> Beach Replenishment | Site Description |
| Proposed Commencement Date: | Proposed Completion Date: | Hours of Operation: |

PREVIOUS DREDGING - (If Known)

Use descriptions as described in the Dredging Methodology section – Pg. 4

| | |
|-------------------------------------|-----------------------------|
| Date Dredged: | Volume Removed: (m3) |
| Dredge Method: | Disposal Method |
| Dredge Grade: (m. below LLW) | Contractor: |

Note:

- 1) Your site, if downstream of Patullo Bridge may be considered for a prop-wash dredging test site. For more information contact Fraser River Port Authority at (604) 524-6655.
- 2) In river disposal at established disposal sites may be considered for clean sand over 0.177mm (medium grain size)

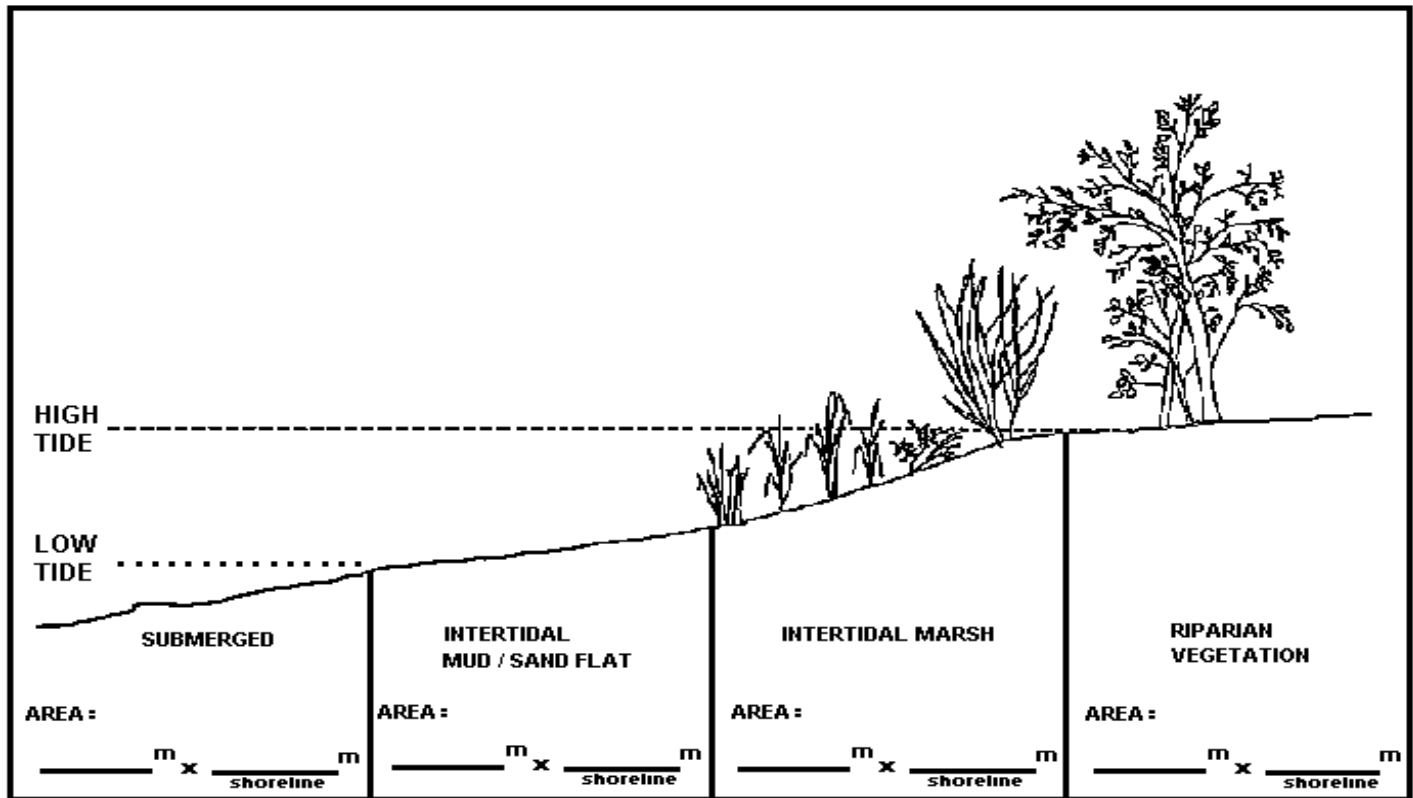
COORDINATED PROJECT REVIEW

DREDGING APPLICATION

DETAILS

On the cross-section diagram, indicate the biological zones affected and calculate the surface area to be affected by construction.

Indicate the area affected using the diagram below as a guide to zones. Enter area affected in the appropriate space in the diagram.



DOES THIS PROJECT REQUIRE...

Do any of the following apply to your project?

FILL Area: _____ m × _____ m Volume: _____ m³

DREDGING Area: _____ m × _____ m Volume: _____ m³

**EXISTING
GRADE**

_____ Metres below LLW

**PROPOSED
GRADE**

_____ Metres below LLW

COORDINATED PROJECT REVIEW
DREDGING APPLICATION

FULL WRITTEN DESCRIPTION OF PROPOSED DREDGING

This section is intended if more detail is required

| |
|--|
| |
|--|

SEDIMENT ANALYSIS INFORMATION

All proposed dredging sites must be sampled and the material must meet the "Interim Contaminant Testing Guidelines" developed by Environment Canada - Disposal at Sea Program http://www.pyr.ec.gc.ca/disposal_at_sea/index_e.htm

*A copy of the sample analysis must be received prior to the project being reviewed.
The analysis is valid for four (4) years and kept on file at FRPA offices.*

| | | | |
|-------------------------------|-----------------------|--|--------------------------------------|
| Sample Date: | No. of Samples | <input type="checkbox"/> Tested for Ocean Disposal | <input type="checkbox"/> Pass |
| | | <input type="checkbox"/> Tested for Upland Disposal | <input type="checkbox"/> Fail |
| Tested By: (Lab) | Telephone: | Cellular: | Fax: |
| Contact Name (at Lab): | | E-Mail Address: | |
| Address: | City: | Province: | Postal Code |

DREDGING CONTRACTOR

| | | | |
|-------------------------|-------------------|------------------------|--------------------|
| Contractor Name: | Telephone: | Cellular: | Fax: |
| Contact Name: | | E-Mail Address: | |
| Mailing Address: | City: | Province: | Postal Code |

COORDINATED PROJECT REVIEW
DREDGING APPLICATION

ACKNOWLEDGEMENT OF APPLICANT OR REPRESENTATIVE

This acknowledgement must be dated and signed prior to submitting this form.

I, _____, certify that I am 19 years of age or older, and that
(PLEASE PRINT)

all information contained herein is true to the best of my knowledge.

Date: _____

(Applicant or representative's signature)

APPLICANT CHECKLIST:

ENSURE THE COMPLETED APPLICATION INCLUDES:

- Application Fee - \$214.00 (Cash or Cheque made payable to "Fraser River Port Authority")
- Letter of Riparian Consent
- Sketches, drawings, or engineered drawings
- Sediment Analysis

FORWARD YOUR APPLICATION BY MAIL OR IN PERSON TO:

Fraser River Port Authority
500 - 713 Columbia Street
New Westminster, BC V3M 1B2

Please contact FRPA staff if you have any questions, or if you need assistance with your application.

Phone: (604) 524-6655
Email: fraserport@frpa.com