



Public Works & Transportation Committee

Anderson Room, City Hall
6911 No. 3 Road

Wednesday, October 17, 2012
4:00 p.m.

Pg. # ITEM

MINUTES

PWT-5 *Motion to adopt the minutes of the meeting of the Public Works & Transportation Committee held on Wednesday, September 19, 2012.*



NEXT COMMITTEE MEETING DATE

Wednesday, November 21, 2012, (tentative date) at 4:00 p.m. in the Anderson Room

PLANNING & DEVELOPMENT DEPARTMENT

1. **TRAFFIC BYLAW AMENDMENT TO REFLECT REVISED FORMAT OF ANNUAL PARADES**

(File Ref. No. 10-6450-19-03) (REDMS No. 3654348)

PWT-13

See Page **PWT-13** for full report

Designated Speaker: Victor Wei

STAFF RECOMMENDATION

That Traffic Bylaw No. 5870, Amendment Bylaw No. 8955 (Attachment 1) be introduced and given first, second and third reading to ensure conformance with the changes approved in December 2011 to the format of the annual Steveston Santa Claus Parade.



2. **REQUEST FOR PILOT INITIATIVE TO PROVIDE SPECIAL PUBLIC ACCESS TO STAFF WASHROOMS IN THE RICHMOND-BRIGHOUSE CANADA LINE STATION**

(File Ref. No. 01-0154-00) (REDMS No. 3654479 v.2)

PWT-17

See Page PWT-17 for full report

Designated Speaker: Victor Wei

STAFF RECOMMENDATION

That Richmond City Council send a letter to TransLink advising of its support for the implementation of the pilot initiative proposed by the Richmond Seniors Network.



COMMUNITY SERVICES DEPARTMENT

3. **UPDATE ON THE ENHANCED PESTICIDE MANAGEMENT PROGRAM**

(File Ref. No. 10-6125-04-01) (REDMS No. 3656638 v. 5)

PWT-23

See Page PWT-23 for full report

Designated Speaker: Lesley Douglas

STAFF RECOMMENDATION

That the staff report dated September 25, 2012 titled Update on the Enhanced Pesticide Management Program from the Interim Director, Sustainability and District Energy be received for information.



ENGINEERING & PUBLIC WORKS DEPARTMENT

4. **SANITARY DUMP STATION**
(File Ref. No. 10-6000-01) (REDMS No. 3666898)

PWT-29

See Page **PWT-29** for full report

Designated Speaker: Tom Stewart

STAFF RECOMMENDATION

That:

- (1) *an Expression of Interest for Sanitary Dump Station service within the City of Richmond be issued; and*
- (2) *staff report back with recommendations based on the results of the Expression of Interest to Council for consideration.*



5. **STEVESTON HARBOUR LONG TERM DEVELOPMENT CONCEPT UPDATE 2012**
(File Ref. No. 06-2345-00) (REDMS No. 3666736)

PWT-33

See Page **PWT-33** for full report

Designated Speakers: Mike Redpath & John Irving

STAFF RECOMMENDATION

- (1) *That no greater than \$2.0M in funding from utility provisions be approved as the City's proportionate share for the dredging of the Steveston Channel, which will only be expended upon the approval and commitment by senior governments of matching grants; and*
- (2) *That Council forward a letter to the Richmond MLAs, MPs, Port Metro Vancouver, Small Craft Harbors and the Steveston Harbour Authority seeking financial support for the future dredging of the Local Area channel in Steveston Harbour.*



Pg. # ITEM

6. **MANAGER'S REPORT**

ADJOURNMENT





Public Works & Transportation Committee

Date: Wednesday, September 19, 2012

Place: Anderson Room
Richmond City Hall

Present: Councillor Linda Barnes, Chair
Councillor Chak Au
Councillor Linda McPhail
Councillor Harold Steves

Absent: Councillor Derek Dang

Call to Order: The Chair called the meeting to order at 4:00 p.m.

MINUTES

It was moved and seconded

That the minutes of the meeting of the Public Works & Transportation Committee held on Wednesday, July 18, 2012, be adopted as circulated.

CARRIED

NEXT COMMITTEE MEETING DATE

Wednesday, October 17, 2012, (tentative date) at 4:00 p.m. in the Anderson Room

PLANNING AND DEVELOPMENT DEPARTMENT

1. **PROVISION OF RESERVED ON-STREET PARKING SPACES FOR CAR-SHARE VEHICLES**
(File Ref. No. 10-6455-00) (REDMS No. 3611395 v.4)

Public Works & Transportation Committee
Wednesday, September 19, 2012

In reply to queries from Committee, Donna Chan, Manager, Transportation Planning, advised that (i) the proposed on-street parking spaces are not located within an existing pay parking zone; (ii) as developments occur along the Canada Line, staff anticipate opportunities to provide additional spaces on private sites; and (iii) currently, Car2Go has two vehicles stationed in the Richmond Kwantlen Polytechnic University campus parking lot.

The Chair indicated that additional information related to car-share companies and how they operate would be valuable information.

It was moved and seconded

- (1) *That the provision of reserved on-street parking spaces for the exclusive use of car-share vehicles, as outlined in the staff report dated August 24, 2012, from the Director, Transportation, be endorsed;*
- (2) *That Traffic Bylaw No. 5870, Amendment Bylaw No. 8944 (Attachment 2), be introduced and given first, second and third reading; and*
- (3) *That Notice of Bylaw Violation Dispute Adjudication No. 8122, Amendment Bylaw No. 8949 (Attachment 3), be introduced and given first, second and third reading.*

CARRIED

ENGINEERING AND PUBLIC WORKS DEPARTMENT

2. PARTNERSHIP WITH FORTISBC TO UTILIZE AND PROMOTE RENEWABLE NATURAL GAS FROM THE LULU ISLAND WASTE TREATMENT PLANT

(File Ref. No. 10-6600-10-01) (REDMS No. 3495055 v.14)

Cecilia Achiam, Interim Director, Sustainability and District Energy, provided background information and clarified a typo on Page 5 of the staff report, noting that the net additional cost to the City in 2014 would be \$32,857.

Ms. Achiam stated that in 2013, the purchase of 360 GJ of renewable natural gas from FortisBC would symbolically represent approximately ten percent of the natural gas consumption of City Hall and South Arm Community Centre. This would be the equivalent to three cars off the road and 13,160 lbs of waste diverted from landfills. In 2014, these figures rise to 72 cars off the road and 305,000 lbs of waste diverted from the landfills.

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In reply to queries from Committee, Ms. Achiam advised that staff anticipate bringing forward a pilot incentive program by Spring 2013, including any financial implications and external funding opportunities to encourage community utility users to reduce greenhouse gas emissions by shifting up to ten percent of their natural gas consumption. Also, she stated that it is anticipated that this service be available for all users.

Siraz Dalmir, Community Energy Solutions Manager, FortisBC, provided background information and stated that this initiative will allow FortisBC to expand its supply of natural gas, thereby lowering the price of it. In reply to a query from Committee, Mr. Dalmir stated that renewable natural gas is made up of the same elements as is found in natural gas.

It was moved and seconded

- (1) That a letter be sent, on behalf of Council, to the British Columbia Utilities Commission (BCUC) indicating that the City of Richmond:*
 - (a) Supports the FortisBC application to convert biogas from the Lulu Island Wastewater Treatment Plant to renewable natural gas; and*
 - (b) Will purchase up to 360 GJ of renewable natural gas, which represents approximately 10% (\$1,870) of the annual natural gas consumption of City Hall and South Arm Community Centre, from FortisBC in 2013;*
- (2) That the City commit to purchasing 10% of the City's annual corporate natural gas consumption of all City facilities under the corporate energy management program as renewable natural gas produced at Lulu Island Wastewater Treatment Plant (Lulu RNG) when it comes on stream with an opt out clause with 90 days notice at the sole discretion of the City; and*
- (3) That staff develop and report to Council on a pilot incentive program, including any financial implication and external funding opportunities, to encourage community utility users (i.e. property and business owners) to reduce GHG emissions by shifting up to 10% of their natural gas consumption to the Lulu RNG.*

CARRIED

Public Works & Transportation Committee
Wednesday, September 19, 2012

3. FOOD SCRAPS/ORGANICS RECYCLING PROGRAM EXPANSION

(File Ref. No. 10-6370-10-05) (REDMS No. 3596009 v.5)

Suzanne Bycraft, Manager, Fleet & Environmental Programs, provided background information and an overview of the proposed program. She indicated that staff are seeking approval to refer the proposed Food Scraps/Organics Recycling Program Expansion for consideration as part of the 2013 utility and capital budget processes. Also, Ms. Bycraft commented on various upcoming issues related to costs associated with solid waste such as increased tipping fees.

With the aid of props, Ms. Bycraft displayed the various sizes of bins that would be available to users of the proposed program expansion.

In reply to queries from Committee, Ms. Bycraft advised that (i) contractors of the proposed large item pickup program would properly dispose of items such as mattresses; and (ii) residents who wish to opt out of the proposed program would not receive any financial credit due to pricing implications.

Discussion ensued regarding Green Carts and Ms. Bycraft indicated that it is anticipated that garbage cans with green waste labels (Green Carts) be phased out over time. Robert Gonzalez, General Manager, Engineering & Public Works, advised that food scraps/organics paper bag disposal will remain in perpetuity.

In reply to a query from Committee, Ms. Bycraft stated that staff have an overall communication strategy with numerous tactics to promote the proposed program expansion should it successfully go through the 2013 utility and capital budget processes. Also, she commented on potential options for food scraps and organics collection services for residents in multi-family dwellings and commercial businesses, and noted that this matter would be subject to a future staff report.

Discussion ensued regarding the financial aspect of the proposed expansion program and Ms. Bycraft stated that there would be increased costs due to the nature of the carts requiring the contractor to utilize additional trucks and personnel. She commented that funding for the capital cost is proposed from the sanitation and recycling provision, therefore there would be no direct financial impact reflected in the rates charged to resident for sanitation and recycling services.

It was moved and seconded

That:

- (1) the new and enhanced recycling program service levels, effective June, 2013, outlined in Option 2 of the staff report from the Director, Public Works Operations be referred for consideration as part of the 2013 utility and capital budget processes to:***

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- (a) add a new level of service for food scraps and organics collection services using City-provided wheeled carts for all multi-family townhome residents currently receiving the City's blue box collection services;*
- (b) provide wheeled carts to all residents in single-family households for the storage and weekly collection of food scraps and organic materials;*
- (c) provide kitchen containers for the temporary storage of food scraps/organics to all residents in single-family and townhome units who currently receive the City's blue box collection services;*
- (2) a large item pickup program, limited to four items per household per year, as outlined in Option 2a) of the staff report from the Manager, Fleet and Environmental Programs, be considered as part of the 2013 utility budget process for implementation in June, 2013 for all single-family and townhome residents in conjunction with the proposed expanded food scraps/organics recycling program; and*
- (3) staff review and report on potential options for food scraps and organics collection services for residents in multi-family dwellings and commercial businesses.*

CARRIED

4. MANAGER'S REPORT

(i) Water Services Division Brochure

Tom Stewart, Director, Public Works, distributed copies of a brochure titled Water Services Division Program, Initiatives and Water Quality (copy on file, City Clerk's Office), and stated that the brochure would be distributed to various community centres, schools, and libraries. Also, Mr. Stewart stated that the brochure would be translated in an effort to reach as many residents as possible.

Discussion ensued and it was suggested that staff work with the City's Intercultural Advisory Committee and the Richmond Health Department in an effort to further expand the communication of this brochure.

(ii) David Suzuki Foundation National Campaign

Ms. Achiam spoke of an upcoming national campaign by the David Suzuki Foundation focused on getting families to get in touch with nature and commented on the various weekly themes of the campaign.

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(iii) Electric Vehicle Charging Stations

The Chair referenced a memorandum dated September 12, 2012 titled Electric Vehicle Charging Stations (copy on file, City Clerk's Office). Mr. Gonzalez confirmed that the City will be receiving \$40,000 in funding from the Province's Community Charging Infrastructure Fund for ten charging stations.

Discussion ensued and suggestions were made in relation to launching the first installation of an electric vehicle charging station.

(iv) Correspondence

The Chair commented on correspondence received in relation to access to washroom facilities at Canada Line stations. Victor Wei, Director, Transportation, stated that staff anticipate bringing a report forward to an upcoming Public Works and Transportation Committee meeting regarding this matter. The Chair requested that staff also provide an update on the Brighthouse bus mall.

The Chair commented on water meters and issues related to hot water tanks. Mr. Stewart stated that he was not aware of any such concerns; however he advised that he would examine the matter.

(v) Miscellaneous Matters

Discussion ensued regarding the following matters:

- parking permits in laneways in Steveston Village;
- reconfiguration of parallel parking stalls in an effort to maximize space; and
- parking plans for the Branscombe House.

Discussion further ensued and the Chair requested that staff provide Council with a memorandum regarding the Branscombe House.

Also, discussion took place regarding the City's aging infrastructure. As result of the discussion, the following **referral** was made:

It was moved and seconded

That staff report back on the City's aging infrastructure.

CARRIED

ADJOURNMENT

It was moved and seconded

That the meeting adjourn (5:00 p.m.).

CARRIED

Public Works & Transportation Committee
Wednesday, September 19, 2012

Certified a true and correct copy of the Minutes of the meeting of the Public Works & Transportation Committee of the Council of the City of Richmond held on Wednesday, September 19, 2012.

Councillor Linda Barnes
Chair

Hanieh Berg
Committee Clerk



City of Richmond

Report to Committee

To: Public Works and Transportation Committee

Date: September 17, 2012

From: Victor Wei, P. Eng.
Director, Transportation

File: 10-6450-19-03/2012-
Vol 01

Re: **TRAFFIC BYLAW AMENDMENT TO REFLECT REVISED FORMAT OF ANNUAL
PARADES**

Staff Recommendation

That Traffic Bylaw No. 5870, Amendment Bylaw No. 8955 (Attachment 1) be introduced and given first, second and third reading to ensure conformance with the changes approved in December 2011 to the format of the annual Steveston Santa Claus Parade.

Victor Wei, P. Eng.
Director, Transportation
(604-276-4131)

Att. 1

REPORT CONCURRENCE			
ROUTED TO:		CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Community Bylaws		<input checked="" type="checkbox"/>	
Law		<input checked="" type="checkbox"/>	
REVIEWED BY SMT SUBCOMMITTEE		INITIALS: 	REVIEWED BY CAO
			INITIALS:

Staff Report

Origin

At the December 19, 2011 regular Council meeting, Council approved an application from the Rotary Club of Steveston to conduct its annual Steveston Santa Claus parade on a different day and using a different route than the previous year's approved format. That report stated that staff would bring forward an amendment to Traffic Bylaw No. 5870 to conform to the revised parade criteria; this report presents the proposed bylaw amendment.

Analysis

Section 7.2 of Traffic Bylaw No. 5870 gives authority to the Director of Transportation to approve the three annual parades listed in Schedule N of the bylaw (i.e., Steveston Salmon Festival parade, Remembrance Day parade and Steveston Santa Claus parade) unless there is a change in the parade format from that approved by Council for the previous year. Thus, annual Council approval of the Steveston Santa Claus parade will not be required provided that the format of the parade does not change from that approved by Council in December 2011.

However, Schedule N of Traffic Bylaw No. 5870 requires amendment as it currently states that the annual Steveston Santa Claus parade is approved to be held on December 24th whereas the revised date approved by Council in December 2011 is December 23rd.

Attachment 1 contains the proposed amendment to Schedule N of Traffic Bylaw No. 5870 to reflect this change. For each of the annual parades, the date of the parade is no longer specified as only the name of the parade is required per Section 7.2 of the bylaw.

Financial Impact

None.

Conclusion

The proposed bylaw amendment would align Schedule N of Traffic Bylaw No. 5870 with the Council-approved format for the 2011 annual Steveston Santa Claus parade.



Joan Caravan
Transportation Planner
(604-276-4035)

JC:lce



Traffic Bylaw No. 5870, Amendment Bylaw No. 8955

The Council of the City of Richmond enacts as follows:

1. Traffic Bylaw No. 5870, as amended, is further amended by repealing Schedule N of Bylaw No. 5870 and substituting the content of Schedule A attached to and forming part of this bylaw.
2. This Bylaw is cited as **"Traffic Bylaw No. 5870, Amendment Bylaw No. 8955"**.

FIRST READING

SECOND READING

THIRD READING

ADOPTED

CITY OF RICHMOND
APPROVED for content by originating dept. VW
APPROVED for legality by Solicitor D

MAYOR

CORPORATE OFFICER

SCHEDULE N TO BYLAW NO. 5870

Annual Parades

The following annual parades may be authorized by the Director of Transportation, subject to section 7.2:

- The Steveston Salmon Festival Parade;
- The Remembrance Day Parade; and
- The Steveston Santa Claus Parade.



City of Richmond

Report to Committee

To: Public Works and Transportation Committee

Date: September 17, 2012

From: Victor Wei, P. Eng.
Director, Transportation

File: 01-0154-00/Vol 01

Re: REQUEST FOR PILOT INITIATIVE TO PROVIDE SPECIAL PUBLIC ACCESS TO
STAFF WASHROOMS IN THE RICHMOND-BRIGHOUSE CANADA LINE STATION

Staff Recommendation

That Richmond City Council send a letter to TransLink advising of its support for the implementation of the pilot initiative proposed by the Richmond Seniors Network.

Victor Wei, P. Eng.
Director, Transportation
(604-276-4131)

REPORT CONCURRENCE				
ROUTED TO:		CONCURRENCE	CONCURRENCE OF GENERAL MANAGER	
Community Social Development.....		<input checked="" type="checkbox"/>		
Development Applications		<input checked="" type="checkbox"/>		
REVIEWED BY SMT SUBCOMMITTEE		INITIALS: 	REVIEWED BY CAO	INITIALS:

Staff Report

Origin

The City has received a copy of a letter (**Attachment 1**) from the Richmond Seniors Network (RSN) addressed to the Chief Executive Officer of TransLink requesting implementation of a pilot initiative whereby seniors, people living with disabilities and families with young children would be provided with special access to the staff washrooms in the Richmond-Brighouse Canada Line Station. The RSN subsequently contacted staff to request City support for the implementation of the pilot project. This report responds to that request.

Analysis

1. Public Use of Staff Washrooms at Canada Line Stations

This issue was first identified to City staff in May 2011, when members of both the Richmond Seniors Advisory Committee (RSAC) and the Richmond Centre for Disability (RCD) advised of the need for public washrooms at all Canada Line stations. In turn, staff requested that BC Rapid Transit Company Ltd (BCRTC, the operating company of TransLink responsible for the SkyTrain system) consider providing public access to staff washrooms in Canada Line stations. BCRTC subsequently advised that staff washrooms would only be made available to the public if “someone approaches an attendant with an urgent need to use a washroom” with the degree of urgency to be determined at the attendant’s discretion. However, recent requests by a RSAC member to use Canada Line station washrooms have all resulted in denial by the attendants.

Given the general desire for the provision of public washrooms near rapid transit stations and BCRTC’s current policy, it is apparent that this issue needs to be addressed on a permanent basis. As such, staff will seek the requirement of providing public washroom facilities as part of TransLink’s planned bus mall development at its eastern end on Buswell Street in close proximity to the Richmond-Brighouse Canada Line station. TransLink and the developer of the recently approved mixed use commercial/residential development adjacent to the station have agreed to provide interim washrooms for bus operators until the ultimate public washrooms are functional.

In the longer term, the provision of additional public washrooms closer to the Canada Line station would also be pursued when the adjacent Brighouse Square site to the south redevelops. In the interim, the RSN is proposing a pilot project as described in Section 2.

2. Proposed Pilot Project

The RSN, which includes representatives from RSAC and RCD, proposes that seniors, people living with disabilities and families with young children be provided with access to the staff washrooms in the Richmond-Brighouse Canada Line Station between 7:00 am and 7:00 pm for a trial period of six to 12 months, after which the pilot initiative would be assessed to determine if it could be made permanent. To bolster its request, the RSN is seeking Council endorsement of and support for the proposal.

Staff recognize that TransLink may incur increased operating costs to implement the pilot project, which may limit its feasibility. Notwithstanding, staff are supportive of the request, as

implementation of the proposal would be considered as a good step forward to improve the accessibility of the Canada Line system and enhance transit service amenities for these passengers.

Financial Impact

None.

Conclusion

Council endorsement of and support for the pilot initiative would lend authority to the request of the Richmond Seniors Network, which may increase its potential for favourable consideration by TransLink. In light of the region's demographic trend of an aging population, increasing the availability of public washrooms would recognize the changing needs of our community and help ensure that the public realm remains accessible and inclusive.

A handwritten signature in dark ink, appearing to read 'Joan Caravan', is positioned above the printed name and title.

Joan Caravan
Transportation Planner
(604-276-4035)



September 12, 2012

COPY

Mr. Ian Jarvis, CEO
TransLink
1600-4720 Kingsway
Burnaby, B.C.
V5H 4N2

Dear Mr. Jarvis,

Re: Access to Washroom at Canada Line Stations

I am writing on behalf of the Richmond Seniors Network (RSN), a community-based planning table comprised of seniors and representatives from agencies that serve seniors. Our purpose is to coordinate and address the needs of seniors in Richmond. The City of Richmond shares our inquiry about access to washroom at Canada Line Stations. This is an important issue and can be very problematic for seniors. Challenges include physical changes related to ageing, specific health conditions and / or difficulty with mobility.

As noted in previous correspondence with Mr. Fred Cummings, President and General Manager, his suggestion that TransLink patrons use the washrooms in adjoining small businesses. This has become a problem as these stores now have signage in their windows "No Public Washrooms".

I understand that seniors using the Canada Line as late as July / August have been denied access to washrooms, as the attendants have not received current policy as to the availability of washrooms to seniors, disabled and young families.

TransLink and RSN appear to be at a "no-win" situation, therefore, perhaps a suggestion as to a pilot project on Canada Line may be feasible. Is it possible that Richmond's Brighthouse Station have their washrooms open with appropriate signage to the above-noted parties, say between the hours of 7:00 a.m. and 7:00 p.m. Brighthouse Station is the start and ending

c/o Volunteer Richmond Information Services
190-7000 Minoru Blvd., Richmond, BC, V6Y 3Z5
Tel: 604-271-8512 Email: Richmondseniornetwork@shaw.ca



COPY

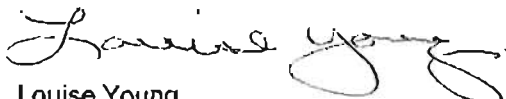


Richmond Seniors Network

point of Canada Line, but most residents have at least a 30 – 40 minute walk and/or ride before arriving at this station, therefore an added need for availability of these washrooms. If TransLink could see its way to provide this public service for six - twelve months and if successful, then we could readdress this issue at that time.

We, at RSN trust that our suggestion will be favourably considered by the Executive and Board as an alternative to the present situation. If you require RSN to meet and present to the Executive / Board, please do not hesitate to contact us.

Yours truly,


Louise Young,
Coordinator

AMC

cc: Nancy Olewiler, Chair of Translink's Board of Directors
Peter Hill, Manager Access Transit, Translink
Hon. Max Polak, Minister of Transportation & Infrastructure
Hon. Ralph Sultan, Minister of State for Seniors
Hon. John Yap, MLA Richmond-Steveston
Linda Reid, MLA East-Richmond
Rob Howard, MLA Richmond Centre
Mayor Malcolm Brodle and Richmond City Council
Victor Wei, Director of Transportation, City of Richmond
Richmond Seniors Advisory Committee

c/o Volunteer Richmond Information Services
190-7000 Minoru Blvd., Richmond, BC, V6V 3Z5
Tel: 604-271-8512 Email: Richmondseniornetwork@shaw.ca





City of Richmond

Report to Committee

To: Public Works and Transportation Committee
From: Cecilia Achiam, MCIP, BCSLA
Interim Director, Sustainability and District
Energy

Date: September 25, 2012
File: 10-6125-04-01/2012-
Vol 01

Re: Update on the Enhanced Pesticide Management Program

Staff Recommendation

That the staff report dated September 25, 2012 regarding Update on the Enhanced Pesticide Management Program from the Interim Director, Sustainability and District Energy be received for information.

Cecilia Achiam, MCIP, BCSLA
Interim Director, Sustainability and District Energy
(604-276-4122)

Att 1

REPORT CONCURRENCE			
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER	
Finance Division	<input checked="" type="checkbox"/>		
Parks Maintenance and Operations	<input checked="" type="checkbox"/>		
Community Bylaws	<input checked="" type="checkbox"/>		
REVIEWED BY SMT SUBCOMMITTEE	INITIALS: 	REVIEWED BY CAO	INITIALS:

Staff Report

Origin

The Enhanced Pesticide Management Program (EPMP) was adopted by Council on April 27, 2009 and has been brought forward to Council on an annual basis for three years. On April 23, 2012, Council approved continuation of the program on a temporary basis until the Province takes action on the use of pesticides for cosmetic purposes.

This report provides an update on the 2012 EPMP highlights and the status of the Provincial *Special Committee on Cosmetic Pesticides* Report recommendations.

Analysis

Since the adoption of the EPMP in 2009, the City has taken a leadership role in the: advancement of research and new generation pesticide products and practices (e.g. corn gluten meal and purchase of an *Aquacide* machine unit); delivery of a variety of popular and well attended natural gardening and lawn care workshops for the community; development of outreach programs for pesticide retailers and industry landscape professionals; and restrictive nature and rigorous application of the Pesticide Use Control (PUC) Bylaw No. 8514, (e.g. fewer Bylaw exemptions and voluntary non-use of cosmetic pesticides on hard surfaces). The technical expertise required for the continued improvement and advancement of the EPMP and related subjects (e.g. invasive species management and control) has grown considerably since the adoption of the Program.

Highlights of the 2012 EPMP is provided in **Attachment 1**.

Through the three years of the EPMP delivery, staff continuously reviews emerging research and techniques, recommending appropriate and effective products and practices specific to manage the City's landscape. These recommendations include training, monitoring programs, pilot projects, adoption of new products, acquisition of new machinery and ongoing data collection in collaboration with Parks and Engineering Operations staff. Provision of this technical expertise positions the City to move forward with programming and best practices that serve to reduce parks maintenance costs in the long term. The City has become known for its leadership role in this area (e.g. *1st Integrated Pest Management Best Practices Field Day*, *Aquacide* equipment unit, corn gluten meal pilot, education/training sessions for Parks staff and local landscape businesses, etc.).

In 2012 the EPMP has broadened in scope to assure an ever-increasing target audience (i.e. city staff, retailers, landscape industry and community) and to support complementary initiatives. These include support for City Operations staff in practical invasive species management as well as collaboration with the Ministry of Forests, Lands and Natural Resource Operations for the control and eradication of an aggressive new invasive plant species to the province, the common reed that poses a significant threat to municipal drainage systems and cranberry operations (i.e. *phragmites*). The program has also evolved to include educational and outreach opportunities such as the City's Earth Day Celebrations, coordination of the Richmond Earth Day Youth (REaDY) Summit and the Climate Change Showdown. Since the adoption of Provincial and

municipal regulations preventing the use of traditional cosmetic pesticides across the country, there has been a significant increase in new generation pesticides and techniques to control pests.

Richmond is one of only three municipalities to receive a \$5000 provincial grant to manage noxious weeds. The provincial government has recently reallocated the City's grant from enforcement to education and outreach for 2013. This was in part based on the recent change from a noxious weed specific enforcement to a broader invasive species management mandate, which resides with Environmental Sustainability rather than with Community Bylaws.

Provincial Special Committee on Cosmetic Pesticides:

As reported in the May 18, 2012 memorandum to Mayor and Council, the *Special Committee on Cosmetic Pesticides* Report (REDMS #3537078) contains 17 recommendations to achieve the goal of reducing pesticide use throughout the province, and ensuring safe and proper use of approved products by unlicensed applicators. The recommendations do not include the support for a provincial wide ban on the cosmetic use of pesticides. Although the Special Committee on Cosmetic Pesticides tabled the report in May 2012, the Province has yet to provide information regarding timelines for review of the Report by the Legislative Assembly. As a result, it will continue to be necessary for the City to maintain and enforce Bylaw 8514 and manage it accordingly using City resources.

2013 EPMP:

The EPMP has been included in the utility budget since Council adoption in 2009. There was a reduction in the overall budget after the first year of the program in 2010 relating to advertising of the PUC Bylaw. The past two years of funding have remained consistent and no increases to the Program budget are proposed for the 2013 utility budget process.

The total financial impact of the EPMP is \$139,169: 61% TFT staff salary; 28% enforcement TFT; and 11% community outreach. The 2012 program's funding has been approved by Council for 2012 and is funded in the Sanitation and Recycling utility budget. As in past practice, the 2013 program will be included in the 2013 Sanitation and Recycling utility budget for consideration by Council. As this is a continuation of an existing level of service, if approved, there will be no impact to the 2013 utility budget and rates as a result of maintaining the TFT Environmental Coordinator position to manage the EPMP.

EPMP Costs		Percentage
TFT Environmental Coordinator (1.0 TFT, salary and benefits)	= \$ 84,687	61%
Education and Community Partnerships	= \$ 15,000	11%
TFT Bylaw Enforcement (0.5 TFT, education, patrols and response)	= \$ 39,482	28%
TOTAL COST	= \$139,169	100%

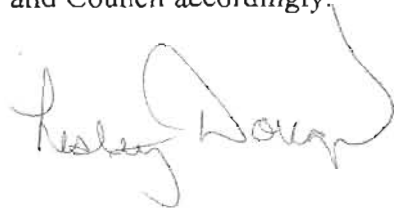
If in the future, the Province takes action towards a regulation, staff will bring back a report to Council to consider elimination of the EPMP staff components.

Financial Impact

This report has no financial impact.

Conclusion

The City's EPMP continues to garner considerable recognition across the province due to the comprehensive and responsive nature of the program adopted by Council. The EPMP was modeled upon successful cosmetic pesticide programs and strategies that combine strong education and outreach programming to support the PUC Bylaw compliance. Ongoing program success is contingent upon continuation of the level of service for the EPMP components which include: *Corporate Reduction; Education and Community Partnership; Senior Government Regulation; and Municipal Regulation*. Staff will continue to build upon the innovation, best practices, outreach and regulatory opportunities to maintain the ongoing leadership of the Program. Provincial Legislative Assembly proceedings related to the *Special Committee on Cosmetic Pesticides* Report will continue to be monitored and updates will be provided to Mayor and Council accordingly.



Lesley Douglas, B.Sc., R.P. Bio.
Manager, Environmental Sustainability
(604-276-4672)

LD:jep

Attachment 1	2012 EPMP Highlights	REDMS #3684503
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2012 EPMP Highlights:

- Approximately 3500 PUC Bylaw Information, and Environmental Sustainability Workshop brochures distributed (including 1000 in Chinese):
 - To City facilities,
 - To the general public during City Events,
 - To local pesticide retailers at point of sale.
- 34 *Natural Gardening* and *Lawn Care* workshops, including 1 in Chinese;
- Advertisements and promotion for the PUC Bylaw and *Natural Gardening* and *Lawn Care* workshops (e.g. local newspapers, Parks, Recreation and Culture Guide, City website, community events etc.);
- Information booth on *Natural Gardening and Pest Solutions* during City Events and at Steveston Farmer and Artisan Markets;
- Responded to approximately 80 information and complaints calls, e-mails and front of house requests, to support compliance with the Bylaw;
- Staff visited Richmond cosmetic pesticide retailers in early Spring and late Summer;
 - All retailers now provide the City PUC Bylaw and Education program information at point of sale,
 - Three retailers continue to offer only Permitted Pesticides in their stores,
 - One traditional pesticide retailer has ceased operations,
 - One pesticide retailer has ceased the sale of traditional pesticides.
- Continued to improve the City's in-house monitoring program to determine the efficiency of Parks and Recreation's use of corn gluten meal for the Sports Field Herbicide Program. The success and methodologies of the program were also shared with neighboring municipalities;
- Parks Operations purchased a new "Aquacide" equipment unit, using steam and heated water to kill weeds, reducing the reliance and costs related to horticultural vinegar use;
- Parks Operations hosted the *1st Integrated Pest Management Best Practices Field Day* to learn and share Best Practices with other Metro Vancouver municipal parks managers and staff (~30 attendees, including industry);
- Community Bylaws continued to promote public awareness and compliance of the PUC Bylaw by conducting weekend patrols and inspections during the months of May, June, July and August 2012. A total of 262 residents and 25 landscaping business operators were provided with compliance instructions pursuant to the Bylaw;
- While no violation tickets were issued for the use of pesticides, 6 municipal tickets were issued to landscapers conducting business in the City without a valid business licence;
- The City's PUC Bylaw continues to be cited as a *model* bylaw to regulate the cosmetic use of pesticides in the province.
- Continued and improved the giant hogweed Early Detection and Rapid Response (EDRR) program by providing advanced notice and information to known and new property owners with giant hogweed infestations. This resulted in a dramatic decrease of reports and complaints throughout the summer of 2012 (13 reports 2011, 3 reports 2012);

- Assisted 8 residents to respond to giant hogweed reports, concerns and removal information on their property;
- Participated in the development of a regional and local response plan for European fire ant infestations;
- Continued to collaborate with the provincial invasive plant EDRR program in identifying potential invasive Phragmites habitat in Richmond;
- Respond to City staff and community information calls on invasive species (e.g. purple loosestrife, Japanese knotweed, English ivy, parrot feather);
- Lead community stewardship projects involving noxious weeds and other invasive plant removal in natural areas (e.g. parks, riparian management areas, environmentally sensitive areas).



City of Richmond

Report to Committee

To: Public Works and Transportation Committee

Date: October 4, 2012

From: Tom Stewart,
Director, Public Works


File: 10-6000-01/2012-Vol
01

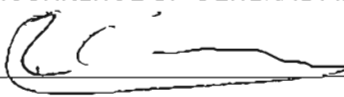


Re: Sanitary Dump Station

Staff Recommendation

That:

1. An Expression of Interest for Sanitary Dump Station service within the City of Richmond be issued; and
2. Staff report back with recommendations based on the results of the Expression of Interest to Council for consideration.

for 
Tom Stewart, AScT.
Director, Public Works
(604-233-3301)

REPORT CONCURRENCE	
CONCURRENCE OF GENERAL MANAGER 	
REVIEWED BY SMT SUBCOMMITTEE	INITIALS: 
REVIEWED BY CAO	INITIALS: 

Staff Report

Origin

Staff received a number of requests from recreational vehicle (RV) owners to construct a Sanitary Dump Station (Sani-Dump) within City limits. A Sani-Dump allows recreational type vehicles equipped with holding tanks the ability to discharge the wastewater into an approved wastewater disposal system.

Background

Currently, there is no Sani-Dump in the City because the existing facilities located at the Shell gas station at Garden City/Lansdowne Road and the Richmond Tourism site at Hwy 99 just north of the tunnel were both closed around 2009. As well, the Sani-Dump located at the Delta Town and Country Inn just south of the tunnel on Hwy 99, closed around 2008. The closest active Sani-Dumps are located in North Burnaby and in Delta near the Tsawwassen Ferry Terminal.

Analysis

The closures of Sani-Dumps over the years have been mostly due to low returns on investment, abuse, and mistreatment. From discussions with the operators we were advised the majority of the abuse comes from commercial vehicles dumping chemicals and other noncompliant liquids into the holding tanks or conveyance systems. The operators also mentioned that RV owners were not cleaning up after using the facility which required a lot of extra staff time.

The majority of Sani-Dumps in BC are privately owned and operated. Sanidump.com identifies the location of Sani-Dumps and many are located at gas service stations or businesses such as Canadian Tire. Staff investigated Sani-Dumps within a 60 km radius outside Richmond and found 8 active sites which were all privately owned and operated. With no active Sani-Dump within the City or nearby, staff reviewed options to have a Sani-Dump constructed in Richmond. The review identified the following two options as the most feasible for the providing Sani-Dump services in Richmond:

1. Private business owner owns and operates a Sani-Dump and the City contributes up to \$10,000 to assist with the installations of utility services. (Recommended)
2. Develop a City owned and operated facility.

Option 1 (recommended) provides financial incentive for private business, which has previously not realized adequate returns, to construct a Sani-Dump by contributing up to \$10,000 towards the required construction of the water and sewer infrastructure needed to support the facility. In return, the private business owner would be required to commit to providing the service for a minimum of five years.

Developing a City owned and operated Sani-Dump facility (Option 2) would be more costly for the City than Option 1. Staff recommends issuing an Expression of Interest to the public that includes the terms of Option 1 to determine if there is private sector interest in operating a Sani-Dump under those terms. Should there be inadequate interest in the Expression of Interest, Option 2 can be considered. The results of the Expression of Interest will be brought to Council for consideration in a subsequent staff report.

Financial Impact

Up to \$10,000 from the 2011 Sewer and Water Minor Capital will be allocated in support of the recommended option provided the Expression of Interest generates suitable submissions.

Conclusion

The City has two realistic options for providing Sani-Dump services in the City of Richmond. Staff recommends exploring the less expensive option, Option 1, through an Expression of Interest for a private business owner to own and operate a Sani-Dump with financial incentive from the City. Should the Expression of Interest not yield an appropriate result, Option 2, a City owned and operated facility, can be considered.



Romeo Bicego
Manager, Sewerage and Drainage
(604-244-1209)

RB



City of Richmond

Report to Committee

To: Public Works and Transportation Committee

Date: October 1, 2012

From: Mike Redpath
Senior Manager, Parks

File: 06-2345-00/Vol 01

John Irving, P.Eng. MPA
Director, Engineering

Re: Steveston Harbour Long Term Development Concept Update 2012

Staff Recommendation

1. That no greater than \$2.0M in funding from utility provisions be approved as the City's proportionate share for the dredging of the Steveston Channel, which will only be expended upon the approval and commitment by senior governments of matching grants.
2. That Council forward a letter to the Richmond MLA's, MP's, Port Metro Vancouver, Small Craft Harbors and the Steveston Harbour Authority seeking financial support for the future dredging of the Local Area channel in Steveston Harbour.

Mike Redpath
Senior Manager, Parks
(604-247-4942)

John Irving, P.Eng. MPA
Director, Engineering
(604-276-4140)

Att. 1

REPORT CONCURRENCE			
ROUTED TO:		CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Finance Division		<input checked="" type="checkbox"/>	
REVIEWED BY SMT SUBCOMMITTEE	INITIALS: 	REVIEWED BY CAO	INITIALS:

Staff Report

Origin

In November 2010, as part of the report: Steveston Harbour Cannery Channel Long Term Development Plan, Eastern Navigation Channel and Intertidal Habitat, the following recommendation was approved:

- (1) "That the concept, use and potential redevelopment of the foreshore in front of the City owned properties at 6240 to 6280 Dyke Road (the Eastern Entrance Plan) for a new navigational channel, causeway, and intertidal habitat area be approved and that the February 2010 Balanced Environmental Plan 5249-D-28.1 provided within the 2010 Hay & Company report be used as the guiding framework until a final plan has been completed;*
- (2) That City staff work together with Steveston Harbour Authority and Small Craft Harbours to establish a Memorandum of Understanding outlining the intent and commitment to work together towards a mutually beneficial long term vision for Steveston Cannery Channel; and*
- (3) That City staff continue to work closely with the Province, Port Metro Vancouver, Small Craft Harbours and Steveston Harbour Authority to clarify roles and responsibilities, finalize all plans, and approval processes, for Phase 1 – Construction of the eastern navigational channel, causeway and intertidal habitat area."*

The purpose of this report is in response to the above and to present an opportunity to work collaboratively with, the Steveston Harbour Authority, Port Metro Vancouver, and Small Craft Harbour's Canada with the goal of advancing work on the Steveston Harbour Long Term Development Plan Concept.

Analysis

Since November 2010, Staff have been working closely with Port Metro Vancouver, the Steveston Harbour Authority, and Small Craft Harbours Canada to advance the Steveston Harbour Vision. Attachment 1 is a summary detailing the need for dredging in the Steveston Harbour in a letter from the Steveston Harbour Authority sent to the Federal Member of Parliament, Kerry-Lynne Findlay. Within this letter, it is estimated that approximately \$8.0M to \$9.0M of dredging is required to facilitate the eastern configuration within the Steveston Harbour channel.

Moving Towards the Vision

In order to advance any work on the Steveston Harbour Long Term Vision Concept Plan dedicated funding is necessary. As there are three levels of government and delegated Authorities who are stakeholders in the Steveston Harbour, a commitment to financial contributions is required by all parties. The Steveston Harbour Long Term Vision Concept Plan requires multi-jurisdictional mutual coordination of efforts for activities such as dredging, ecological enhancements, flood protection, infrastructure development and more.

Current Reality- The Need for Dredging

Since the end of the federally funded dredging program in 2008 for local area channels such as the Steveston Harbour, significant sedimentation has occurred in the local waterways resulting in economical and navigational concerns.

For example, the build up of sediment along Steveston Island in the Channel is narrowing the harbour navigable channel width, and access to moorage in the Steveston Harbour for vessels with drafts greater than 12 feet is extremely difficult and impossible at times. In addition, Scotch Pond's entrance from the channel is now only accessible at high tide by shallow draft vessels with visible areas now forming where there never used to be land in the channel.

A safe and accessible harbour ensures continued commerce on and along the Fraser River in Steveston. Local area dredging in the Steveston Channel will also permit the facilitation of special events such as Ships to Shore, the Tall Ship Festival, and other maritime events.

Richmond's maritime commercial and recreational activities will no longer be available in the future if the harbour is not dredged and if a long term strategy is not in place to maintain the sediment build up of the channels.

Flood Management

The design for the eastern end of Steveston harbour includes the removal of the existing weir, construction of a new causeway and navigation channel that will allow boats to enter the harbour from the east, the development of new and productive marsh and riparian habitat (6.7 acres), and the construction of public amenities such as boardwalks and outlooks. This report proposes that Phase 1 of the Steveston Harbour Long Term Vision Plan be advanced which would result in the establishment of a portion of the new habitat park area, and dredging of the Harbour.

To date, two primary dike alignments for raising dikes between Garry Point and London Farm have been identified. Alignment 1 is on Lulu Island, it follows a combination of existing and new alignments. Alignment 2 makes use of Steveston Island, it would require the construction of a completely new dike on the island plus additional structures to close off the harbour.

Alignment 2 has a similar footprint proposed under the Steveston Harbour Long Term Development Plan, and conceptually the two plans could be designed to complement each other. On July 23, 2012, Council endorsed that the public and key external stakeholders be consulted to provide feedback on the Steveston area and the West Dike flood protection concepts identified in the staff report titled Dike Master Plan – Phase 1. Consultation is currently underway.

Delta Precedent:

Since 2008, the Corporation of Delta's staff has met with Federal Ministers and Senior Government staff to lobby a number of issues, including the reinstatement of funding to dredge their secondary channels of the lower Fraser River. Delta has also been working with Port Metro Vancouver and other stakeholders to develop a strategy and identify funding sources to alleviate the sedimentation problems that are occurring in the Ladner Harbour.

In July 2012, The Corporation of Delta completed a study detailing the social, economic and environmental impacts in support of dredging river sediment in the Ladner Channel basin. Utilizing this background information, the Corporation of Delta has committed \$2.0M in funding to dredging in their harbour. Delta is currently seeking partnerships in securing \$8.0M in collaborative funding from the following stakeholders, Port Metro Vancouver, the Federal Government of Canada, and the Province of B.C.

Local Area Dredging Contribution Program

Port Metro Vancouver has now established a Local Channel Dredging Contribution Program which can only be used for activities directly related to the preparation of an application to dredge. The funding assistance for up to a maximum of \$125,000 or 10% per local channel can only be used for items such as survey depth soundings, computer modelling, volume calculations, soil testing etc. but cannot be used for the dredging operations. It is recommended that the City apply for this potential funding to solicit a similar level of support as was awarded to Delta.

Next Steps

In order to preserve a continued working maritime harbour within the Steveston Channel, funding is required to complete the following:

1. To advance the implementation of the overall Steveston Harbour Long Term Vision Concept Plan - undertake \$8.0M of dredging operations in the Steveston Channel.
2. To solicit matching funding from Federal, Provincial levels of Government and port authorities.

Financial Impact

This report proposes that \$2.0M in funding from utility provisions be approved as the City's proportionate share for the dredging of the Steveston Channel, which will only be expended upon the approval and commitment by senior governments of matching grants

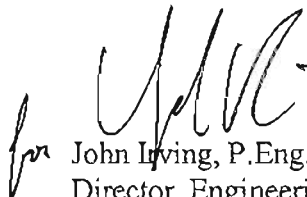
Conclusion

Richmond's Steveston Harbour is the homeport to over 350 commercial fishing vessels and many other recreational, commercial and heritage interests. It provides a legacy for many generations to come as a historical fishing village that has now evolved into a world class city.

In order for the Steveston Harbour to maintain its operations and activities, planning and preparation for the Steveston Harbour Long Term Vision Concept Plan and the immediate dredging of the channel is required.



Mike Redpath
Senior Manager, Parks



John Irving, P.Eng. MPA
Director, Engineering



TO: MAJOR & EACH
COUNCILLOR
FROM: CITY CLERK'S OFFICE

0140-20-SHA/21

September 7, 2012

STEVESTON HARBOUR AUTHORITY

12740 Trilts Road, Richmond, B.C. V7E 3R8 604-272-5539 Fax 604-271-6142

Kerry-Lynne D. Findlay, QC, MP
Room 650, La Promenade Building
House of Commons
Ottawa, Ontario K1A 0A6

PHOTOCOPIED

SEP 7 2012

Dear Ms. Findlay:

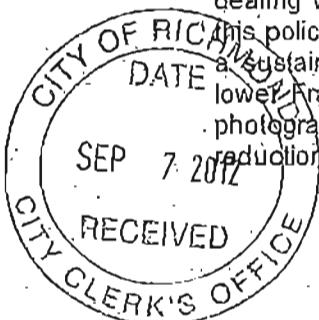
& DISTRIBUTED

RE: DREDGING, STEVESTON HARBOUR

Please allow me to introduce myself, my name is Ross Holkestad and I am the Board Chairman on the Steveston Harbour Authority ("SHA") Board of Directors. SHA is the largest commercial fishing harbour in Canada and is homeport to over 350 commercial fishing vessels. The harbour is also home to many services that fishermen all over the province utilize such as a seafood auction, marine insurance, vessel repair, travel lift, an unloading station and an ice house. Each year, anywhere from 30-65 million pounds of seafood are offloaded at our facilities.

I write to bring to your attention a serious challenge facing SHA, its many businesses and fishermen in the lower mainland - maintenance dredging of the harbour and tributaries. I understand that you are familiar with the problems facing Steveston Harbour as the General Manager, Bob Baziuk has provided you with documentation and photographs relating to this issue and that you have had numerous discussions with SHA directors and other stakeholders.

I cannot stress enough the urgency that we face in regards to infill off the Fraser River and in specific, how it affects the Steveston Cannery Channel and Steveston Harbour. As you are aware, in 1998, the Government of Canada, through the Coast Guard, withdrew all funding for local channel dredging on the lower Fraser River. This obligation was subsequently downloaded to local port authorities. In 2008, the Vancouver Fraser Port Authority ("Port Metro") abruptly stopped providing any funding for the annual dredging of local channels. Instead, Port Metro established a local channel dredging contribution program; however, this funding can only be used for activities directly related to preparing an application for funding and not for dredging (see Appendix A to this letter). This program does not come anywhere near dealing with the sediment infill accumulation in Steveston Harbour. The impact of this policy change is significant and has placed an impetus on the implementation of a sustainable long-term management plan for Steveston Harbour and the entire lower Fraser River basin. See Appendix B to this letter for recent and past aerial photographs taken in the area that clearly portray the ominous consequences of the reduction in dredging maintenance has caused. The specific needs of the SHA can



be divided into three primary categories, as set forth below.

1. *SHA requires an immediate increase in funding for dredging maintenance from the Government of Canada.*

Steveston Harbour and Steveston Cannery Channel are in desperate need of increased dredging efforts in order to maintain the commercial fishery and the businesses that rely on it. Immediate actions are required to bring both the harbour and channel to a safe and acceptable depth for the safe passage of Canadian fishing vessels as well as pleasure and other boats.

From 2002 to 2012, the Department of Fisheries and Oceans – Small Craft Harbours Division ("SCH") has contributed an aggregate of \$2,760,000 towards dredging Steveston Harbour. Please refer to the "Steveston Harbour Authority Dredging Funding Summary" attached as Appendix C to this letter. A brief perusal of this appendix will illustrate that funding has been sporadic and has not kept up with the infill. Please note that there are a great number of costs associated with dredging before any infill is actually taken out such as mobilization of equipment, ocean disposal fees and price per cubic meter. All of these factors affect the volume of dredge removed.

In recent years, both Port Metro and SCH have established firm jurisdictional boundaries. It is my estimate that to bring the Steveston Cannery Channel back to the historic depth of five (5) meters and the tributary waterlots of SCH and others to three (3) meters at a zero tide would require in excess of \$2,000,000 in funding. These historic depths are the minimum acceptable level for SHA to operate and provide services to our vibrant commercial fishing fleet on a consistent and reliable basis. Due to the dramatic decrease in funding for dredging the channel and harbour, the depths are much shallower. In some cases the channel is as shallow as 2.5 meters at 0 tide and the waterlots are as shallow as 1.5 meters at 0 tide.

Furthermore, it has been estimated that the amount of infill settling in Steveston Harbour each year is 22,800m³. It would also be prudent to review the width of the Steveston Cannery Channel and maximize it for safe passage of all vessels. Adding clear markers that properly outline the navigational channel would greatly improve safety in the channel and harbour. It goes without saying that current levels of funding do not allow for these important studies to take place such that we can properly ascertain our specific needs.

Please continue your efforts in obtaining additional funding for dredging in this area. Our situation is dire, and if something is not done in the very near future, the harbour will become a navigation hazard and rendered unusable for this active fishing fleet, which remains the largest in Canada to this day.

2. *SHA and other stakeholders require funding for permanent structures that will lead to a substantial and perennial reduction in future dredging maintenance costs.*

SHA is fully in line with SCH's ultimate goal to establish a long-term approach to

solving annual maintenance dredging funding issues problems through permanent structures. Particularly in an era of fiscal austerity, we recognize it is not acceptable or realistic to continue asking for increased funding for dredging maintenance without taking serious measures to mitigate the problem.

Accordingly, the SHA has taken a role in working with SCH, Port Metro and the City of Richmond (collectively, the "Interested Organizations") in assessing the options, costs and regulatory hurdles in order to erect such structures. More specifically, the Interested Organizations are encouraged by a 2010 report prepared by Hay & Company Consultants for the City of Richmond, attached to this letter as Appendix D. This report concluded that reconfiguration of the harbour and surrounding area would significantly reduce the amount of infill settling in the harbour. A 2008 report from Hay & Company addressed to SCH also indicated that a berm/tidal marsh structure upstream of the eastern entrance of Steveston Harbour could reduce infill inside the harbour by 36% annually. This infill reduction would also be complemented by a substantial reduction in trees and other debris entering the harbour, which in and of itself is major annual expense incurred by SHA and SCH, in addition to causing extreme havoc to both vessels and harbour infrastructure.

Please note that the Interested Organizations have yet to determine what the harbour configuration would look like, have not committed any funds to any such project, and have not obtained enough information on what regulatory and jurisdictions hurdles would face them in embarking on such a project. The Interested Organizations are, however, devoting a great deal of time to study any solutions to the worsening problem of infill in Steveston Harbour.

Clearly, harbour reconfiguration could produce many benefits including: considerably reducing annual dredging costs, creating new inter-tidal marine habitat along the waterfront, reducing the Crown's liability in the event of vessels grounding, improving fishing operations, enhancing harbour navigation and creating new tourism opportunities.

The approximate overall cost to recognize any form of this possible reconfiguration to the eastern harbour channel entrance is difficult to estimate; however, our preliminary research suggests that it would fall in the range of approximately \$8-10 million dollars. I write today to seek what funding is available to study the options and finally undertake the project that is determined to be the most economical, efficient and productive for all users of Steveston Harbour.

I wish to emphasize that any additional funds that are committed to any such project would not obviate the need for the Government of Canada to provide initial additional funds for dredging maintenance, as requested in #1, above. It is imperative that the depth of Steveston Harbour and Steveston Cannery Channel be brought down to an acceptable level as soon as possible and prior to the commencement of any such project.

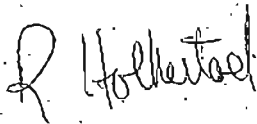
3. *The Interested Organizations require a definitive answer regarding disposing of dredgeate on Steveston Island.*

Whether it is in respect to our request for additional funding for dredging maintenance or a permanent structure that mitigates the problem of Infill, it is essential that the Government of Canada provide us with a decision on whether dredgeate may be disposed on Steveston Island. The SHA in particular is extremely frustrated with the lack of clarity on this issue.

As you may be aware, Steveston Island is a man-made island and was erected by dumping dredgeate from the mid 1900s. It would be ideal, for example, if the dredgeate could be used to create an environmental tidal marsh at the east end of Steveston Island. I will note that using dredgeate for land reclamation ensures that the functionality of the harbour is achieved as well as contributing to the enhancement of the environment and subsequent feeding grounds for the Fraser River salmon. Furthermore, disposing of dredgeate on Steveston Island would significantly reduce the dumping fees incurred by SCH and the Government of Canada in terms of annual dredging maintenance.

Please be advised that this letter is being provided to you by the undersigned solely on behalf of the SHA. I await your reply on these most important matters. If you require any further information from the SHA, please do not hesitate to contact me.

Yours truly,



Ross Holkestad, Chairman
Board of Directors
Steveston Harbour Authority

Cc: Steveston Harbour Authority Board of Directors
Mayor & Council, City of Richmond
Robert Gonzalez, General Manager, Engineering & Public Works, City of Richmond
Dave Semple, General Manager, Parks & Recreation, City of Richmond
Ken Smith, Regional Director, SCH
Robin Richardson, Regional Manager – Client Services, SCH
Allan Baydala, Chief Executive Officer, Port Metro
Tom Corsie, Vice President – Real Estate, Port Metro

APPENDIX D

CREATING AND DELIVERING BETTER SOLUTIONS

www.hayco.com

City of Richmond

ISSUED FOR USE

PROPOSED UPSTREAM ENTRANCE MODIFICATION
STEVESTON HARBOUR

V31101113

February 2010

HAY & COMPANY CONSULTANTS - A Division of EBA Engineering Consultants Ltd.
p. 604.875.8391 • f. 604.875.8363
#900 - 1066 West Hastings Street • Vancouver, British Columbia V6E 3X2 • CANADA



EXECUTIVE SUMMARY

The principal findings of this study can be summarized as follows:

- The conceptual layout of proposed artificial islands to be located upstream of the eastern entrance to Steveston Harbour appears to be feasible with respect to the expected flow velocity field that would result from this construction.
- The concept of artificial islands and habitat creation in this area can reasonably be incorporated into the original idea of controlling sediment and debris flows into Steveston Harbour, previously considered by the Harbour Authority and the Small Craft Harbours Branch of Fisheries and Oceans Canada.
- There are limited volumes of suitable dredge material currently being hauled by barge past this area for disposal by operators. Only one, Fraser River Pile and Dredge, working for Fraser Port (Port Metro Vancouver), currently disposes of material of sufficient quality and quantity for application to the proposed reclamation.
- The present Fraser River Pile and Dredge operation in maintaining the Steveston Cut portion of the adjacent navigation channel offers the possibility of utilizing the dredge material produced by their hopper dredge. However, this would entail a transfer pit for dumping into and then hydraulic pipelining to the desired island reclamation. This could be done at an estimated net cost of \$7.50/m³.
- A more cost effective method may be to negotiate an arrangement with Fraser River Pile and Dredge by which a hydraulic pipeline dredge would be used for maintenance dredging a portion of the adjacent Steveston Cut. The material would be pipelined directly to create the desired islands. From discussions with the Port and Fraser River Pile and Dredge, this cost is estimated at \$6.50/m³.
- Clamshell maintenance dredging could also be considered as another possible economical method to use maintenance dredged material for construction of the habitat islands, given the material would not have to be barged for ocean disposal.
- The project costs have been estimated at \$9.7 million for the least favourable option and \$9.24 million for the most cost-effective option, including a contingency allowance of 15% but excluding engineering, permitting and site data acquisition.
- The area of new productive habitat created by the proposed reclamation would be approximately 66,815 m² or 6.7 hectares.
- The estimated value of the new habitat created would be in the range of \$3,000,000 to \$4,000,000 which may be recoverable a credit for use on other projects with Fishery impacts.

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FIGURES

- Figure 1 Habitat Islands Concept Plan and Section, Option A
Figure 2 Habitat Islands Concept Plan and Section, Option B

APPENDICES

- Appendix A Hayco's Proposal Letter
Appendix B Hayco's Sediment Control Model Results
Appendix C Hayco's Assessment of the Stability of the Proposed Reclamation
Appendix D Balanced Environmental's Enhancement Features Feasibility Study
Appendix E Hayco's Services Agreement and General Conditions

1.0 INTRODUCTION

This study, undertaken at the request of the City of Richmond, encompasses a concept for modification to the upstream entrance to Steveston Harbour. The Terms of Reference for the study were finalized through discussions with the City of Richmond, resulting in a proposal by Hay & Company Consultants (Hayco) dated August 18, 2009.

2.0 TERMS OF REFERENCE

A copy of the Hayco proposal is attached as Appendix A and the listed task items are discussed in the following sections.

3.0 STUDY APPROACH

For purposes of this study, the concept layout proposed by Balanced Environmental has been superimposed on the modelled layout of a control structure previously considered by Hayco for reduction of sediment inflow into Steveston Harbour. This has resulted in a baseplan that incorporates the original concept of reducing maintenance dredging in Steveston Harbour while maximizing the potential for habitat creation immediately upstream of the proposed sediment control structure. In addition, the concept layout now provides a suitable channel for future navigation by vessels that wish to use an upstream access route into the harbour. Two possible options for the width of an access channel have been considered, i.e. 30 m and 40 m. This is a design feature that will be dependant on any future modifications that may be considered for the downstream harbour entrance.

From initial discussions with the client, it was directed that the level of effort involved in this assessment would not justify additional numerical model analysis of the island creation concept. Rather, the previous modelling outputs would be sufficiently indicative of sideslope stabilities and armouring requirements. Also, existing geotechnical data would be sufficient to estimate seismic stability and settlement of the reclamation.

3.1 HYDRAULIC FEASIBILITY AND STABILITY ASSESSMENT

A concept for a sediment control structure at the upstream entrance to Steveston Harbour is attached as Appendix B. The proposed structure was developed by Hayco under the direction of the Small Craft Harbours Branch (SCH) of Fisheries and Oceans Canada. This model study demonstrated the effectiveness of sediment control, and some variation is assumed will be suitable for the proposed artificial islands and enlargement of the habitat creation area. A velocity field resulting from the sediment control structure, with the proposed artificial islands superimposed, is shown in Appendix B.

With respect to stability of the proposed reclamation, our overview assessment is outlined in attached Appendix C. The only significant concerns relate to potential long-term settlements and seismic performance of the proposed fill and berms. For the future purpose of this initial feasibility overview and cost estimating, the long-term settlements are a factor that should be taken into account. These settlements could be in the range of 1 m and the resulting increase to the fill quality could be approximately 50,000 m. Hence, this contingency cost item could be in the order of \$350,000.

The attached baseplan has been developed from the concept that was presented by SCH to Stakeholders during a meeting recently conducted at the office of the Steveston Harbour Authority. The engineering details that have now been added, such as layout adjustment for hydraulic performance, sideslope armouring and harbour access channel dimensions, are features that we consider to be appropriate for this initial level of project feasibility and cost estimating. The baseplan includes a typical cross-section through the islands to illustrate the assumed reclamation methodology.

From initial discussion with the client, we understand that the public amenities envisaged at this conceptual stage would involve a public access foot bridge connecting Richmond with the upriver island, a walkway across the island and a public viewing structure extending out from the new upstream island. The addition of a possible landing float extending out into the river is not envisaged at this time.

- Access from Richmond to the island would be via a wooden pile structure supporting a wooden deck 3 m wide, with suitable handrails;
- A walkway across the upstream island would entail a 0.5 m lift of gravel topped with crushed surface material, 3 m wide, and;
- A public viewing facility is assumed to be a wood pile trestle structure, 2 m wide connecting the new upstream island to two wooden viewing platforms, each measuring 50 m² in area.



3.4 DREDGEATE MATERIAL UTILIZATION

We have contacted Environment Canada, Ocean Dumping Branch, in order to obtain relevant data concerning the ocean dumping permits now in effect that could yield material for creation of the proposed artificial islands. The objective would be to utilize barged material from dredging in the river that would otherwise be dumped at the ocean disposal sites either off Sandheads or the one off Point Grey. We are advised that permits are currently held by the following operations:

- Fraser Port (now Port Metro Vancouver);
- Fraser River Pile and Dredge;
- JJM Construction;
- Vancouver Piledriving, and;
- Delta Tug and Barge.

We have contacted these operators to discuss the possibility of utilizing some of their dredgeate material for the creation of artificial islands as configured on our conceptual baseplan. From these discussions, we are given to understand that the following volumes might be considered for diversion from ocean disposal:

- Fraser Port – covers channel maintenance in the lower reaches of the river. Allows for ocean dumping as required by the contractor that undertakes channel maintenance.
- Fraser River Pile and Dredge – hopper dredging disposal at Sandheads conducted annually with volumes generally exceeding one million m^3 .
- JJM Construction – no dredgeate disposal in foreseeable future.
- Vancouver Piledriving – possibly 10,000 m^3 from a new moorage at Tilbury Island.
- Delta Tug and Barge – annual dredging of approximately 20,000 m^3 from marine maintenance, usually done for existing marinas.

From our discussions with the various operators on the river, it is clear that Fraser River Pile and Dredge, under contract to Port Metro Vancouver, would be the only viable operator in a position to supply the volume and quality of material necessary for creation of the proposed artificial islands. Each year, they are disposing of volumes by hopper dredge that far exceed the required total volume of material needed for construction of the proposed islands. The quality of material disposed of is generally sand with a small percentage of silt, ideal for the base material of the proposed islands.

From the standpoint of feasibility, the utilization of hopper dredged material would entail the creation of a transfer pit into which the hopper dredge would deposit its load. Once filled, this transfer pit would be cleaned out periodically by hydraulic pipeline dredge and the material would then be distributed as required to create the islands that are envisaged. With the transfer pit in place, other operators on the river, with small

quantities of fine-grained dredgeate available for possible diversion from ocean dumping, could be invited to dump into the transfer pit. Presumably a dumping fee might be applied for the use of the transfer pit but we have not accounted for this potential minor revenue source in our cost estimates. Our basic assumption of developing the proposed transfer pit by hydraulic pipeline dredge, filling it from materials derived from hopper dredge operations and cleaning it out periodically by pipeline dredge would entail a cost estimated at \$7.50/m³, assuming the dredge "Columbia" is used by Fraser River Pile and Dredge to initially create the transfer pit and ultimately transfer the material from the pit to the islands. We also assume that the dredgeate deposited by the hopper dredge would be made available free of charge because it would provide some savings to Fraser River Pile and Dredge since this alternative would reduce the distance for disposal of at least some of the material dredged annually from Steveston cut.

A more cost-effective alternative for obtaining the reclamation material for creation of the proposed artificial islands would be to arrange for direct hydraulic pipeline dredging of maintenance dredging material from Steveston Cut. This would entail some type of suitable agreement with Fraser River Pile and Dredge. Such an agreement would spell out the volumes, disposal requirements and associated costs. We have discussed this possibility in general terms, with Mr. Dave Hart of Port Metro Vancouver and Mr. John Helmerick of Fraser River Pile and Dredge. Both have indicated that this idea could be arranged within the existing contract. The economic advantages would be:

- Cost would be reduced to between \$5.50 and \$7.50/m³. (We assume \$6.50 for estimating.)
- The material could be placed as needed on the islands, to reduce subsequent contouring costs.

Hayco has been requested to consider whether the materials derived from on-going maintenance dredging operations within Steveston Harbour could be used to contribute to the artificial island creation concept. There are a number of challenges associated with this approach:

- The materials that comprise the riverbed within Steveston Harbour are generally finer grained than those within the main channel of the River. Thus the material derived from within the harbour are more likely to remain in suspension and drift downstream during placement, or to remobilize subsequent to placement due to main channel currents;
- The fine grained materials derived from within Steveston Harbour are not as well suited for use as the foundation materials for the artificial island as are the coarser grained sediments available within the main channel;
- The costs associated with pipeline dredging within the harbour and extending the discharge pipeline to the artificial island locations are likely to exceed that associated with simply discharging the material directly to the main channel as has been successfully completed on two previous occasions.

- Material derived through clamshell dredging within the harbour could be disposed within the artificial islands at reduced cost relative to that associated with ocean disposal on the assumption that hopper dredges are utilized. However, a transfer pit would still be necessary and the transfer pit would infill as a consequence of sediment transport within the main channel during freshet. Thus this approach would only be feasible if a large quantity of maintenance dredging by clamshell was envisaged.

3.5 ENVIRONMENTAL DESIGN AND HABITAT CREATION

The proposed habitat treatments include the creation of the following high value habitats, all of which provide unique habitat functions to enhance the Fraser River Estuary:

1. Off-Channel Fish Habitat

- a. A variety of juvenile fish, such as Coho salmon, use the Fraser River Estuary as a stopping ground to become acclimated to saltwater on their seaward migration. They prefer areas of slower velocity water that are protected from predators and abundant in food. These conditions are provided by off-channel habitats.
- b. The proposed habitat treatments will create 32,165 m² of new off-channel fish habitat.

2. Brackish Marsh Habitat

- a. Brackish marsh habitat provides shelter for juvenile fish from predators during periods of inundation. It also is home to a variety of invertebrates which provide food to juvenile fish, birds, and other wildlife. Marshes improve water quality by slowing water flow and allowing the deposition of fines and also uptake of hydrocarbons and other deleterious substances. Marshes provide natural shoreline stabilization with their root structures, avoiding the need for unnatural riprap shorelines.
- b. The proposed habitat treatments will create 25,555 m² of new brackish marsh habitat.

3. Riparian Habitat

- a. A riparian fringe along a watercourse is an important component of an ecosystem. Riparian areas contribute large woody debris, insect drop, detritus and shade to the neighbouring watercourse. They also provide natural slope stability and improve water quality. A variety of raptors and other birds live, feed, and nest along riparian areas.
- b. The proposed habitat treatments will create 28,592 m² of new riparian habitat.

4. Freshwater Wetland Habitat

- a. The fresh water habitat feature will provide habitat for freshwater amphibians and invertebrates, providing food for a variety of bird species and other organisms.
- b. The proposed habitat treatments will create 3,503 m² of new freshwater wetland habitat.

Implementation of the habitat treatments will involve contouring placed dredge material and growing medium by land based plough over the specified areas (see attached drawings). Planting of the riparian areas will be divided into high-density (1 plant per m^2) and low-density (1 plant per $5 m^2$) plantings depending on their proximity to public amenities. Marsh planting will occur at the typical marsh planting density of 2 plugs per m^2 .

To determine the estimated cost of habitat treatments for the proposed islands, an estimated volume of material ($59,524 m^3$) to be contoured was estimated and multiplied by the rate at which the proposed equipment is expected to operate (\$5.0 per m^3). These rates are based on previous marsh construction projects supervised by Balanced Environmental Services Inc.

In addition to contouring, an estimated number of plant plugs have been determined from the assigned planting densities shown on Drawings 5192-D-02.1 and 03.1 and multiplied by estimated purchase and labour rates to determine the cost of planting the new habitat treatments. Surveying and monitoring were included in these estimates. Tables, Drawings, and a description of assumptions are listed in Appendix D, Section 2.

To determine the amount of habitat credit that may be available from proposed habitat treatments, habitat values from previous *Fisheries Act* Authorizations were used in comparison with the types of net habitat areas that will be created or lost. The resulting credits from this analysis yielded a net increase in habitat value of +238,473 *hectares*.

Construction of the proposed enhancement features may provide compensation credits that could be used to offset compensation requirements for other projects ranging in footprint size from $30,600 m^2$ to $150,000 m^2$. The sale of these credits to other projects represents an opportunity to the City of Richmond to recover its investment in the construction of the artificial islands. The habitat credits provided by the project are considered to represent a value of between \$3,000,000 and \$4,000,000.

Habitat credits vary depending on project specific factors raised during negotiations with DFO, including the amount of critical habitat impacted by the other project proponents seeking credit, and the cost to construct similar compensation near the other project proponent's site. DFO would have to agree to the actual value of these credits. It is our understanding that Port Metro Vancouver is seeking habitat credits to offset a number of its development project and, as such, may be an interested partner in this project.

If the habitat island concept is not pursued, there will still, presumably, be a requirement for improved sediment and debris control at the upstream end of the harbour and this will necessitate the construction of a suitable control structure. Once the control structure has been implemented there would be the potential to create, on a progressive basis, a sloped habitat infill bench using dredge spoil. It is uncertain whether DFO would recognize habitat credits for a progressive infilling that may evolve over a relatively longer period of time.

For additional information of preliminary habitat design and costing calculations, see Appendix D.

3.6 COST ESTIMATION

The estimated cost for implementing the conceptual layout illustrated on our baseplan will be broken down for two possible options:

Option 1 - Provides a 40 m wide navigation access channel into the existing harbour.

Option 2 - Provides 30 m wide channel.

For the two options, we have considered the possibilities of:

- (a) Utilizing dredgeate from the ongoing Fraser River Pile and Dredge hopper dredging; and,
- (b) Utilizing navigation channel dredgeate that could be placed by way of a hydraulic pipeline dredge, through an arrangement with Fraser River Pile and Dredge.

Our cost estimates include a \$0.5 million allowance for public amenities, but this amount will have to be reviewed in detail subject to confirmation from the City of their specific requirements.

Estimates:

Option 1(a) – Estimated cost utilizing hopper dredging with transfer pit and 40 m wide access channel:

Berm construction along access channel and river side of East Island 60,000 m ³ (12" minus material) @ \$50.....	\$ 3,000,000
Access channel slope protection and toe berm 16,000 m ³ (6" minus material) @ \$50.....	800,000
Quarried rock mattress for berms 12,000 m ³ (3" minus material) @ \$60.....	720,000
Dredge access channel, 59,000 m ³ @ \$8.....	470,000
Net reclamation volume by hopper dredge 210,000 m ³ @ \$7.50.....	1,600,000
Remove existing rock weir 3,000 m ³ @ \$50.....	150,000
Habitat treatments for islands (contouring, planting).....	1,000,000
Public Amenities.....	500,000
	<u>\$8,240,000</u>

Option 1(b) – Estimated cost utilizing pipeline dredge, pumping directing into proposed islands:

Same as 1(a) except cost of dredgeate reduced by \$1/m ³ , i.e. from \$7.50 to \$6.50/m ³ covering 210,000, i.e. reduction of \$210,000.....	<u>-210,000</u>
	<u>\$8,030,000</u>

Option 2(a) – Estimated cost utilizing hopper dredging with transfer pit and 30 m wide access channel:

Same as 1(a) except cost of dredging access channel reduced by \$90,000, reclamation increased by \$150,000 and habitat treatment increased by 100,000 for a net increase of \$160,000.....+160,000

\$8,400,000

Option 2(b) – Estimated cost utilizing pipeline dredge, pumping directly into proposed islands:

Same as 1(a) except cost of dredging access channel reduced by \$90,000, reclamation increased by \$137,000, and habitat treatment increased by 100,000 for a net increase of \$147,000.....+147,000

\$8,387,000

In all cases, a contingency allowance of 15% should be applied.

Hence the more costly option 2(a) would be estimated at

$\$8,400,000 \times 1.15 =$\$9.7 million

And the least costly option 1(b) would be estimated at

$\$8,030,000 \times 1.15 =$\$9.24 million

The above estimates do not include the costs of engineering, site testing or permitting.

4.0 CONCLUSIONS

On the basis of the foregoing general assessment of the reclamation and habitat enhancement concept, it appears feasible to:

- Obtain and place the dredge material at reasonable cost;
- Create the desired habitat enhancement of the area that would qualify for off-site "credits" normally applied to development projects on the foreshore; and
- Configure the concept to yield hydraulic impacts that will be acceptable with respect to resulting sedimentation, velocity fields and river dynamics. This presumes that more detailed hydraulic numerical modeling would form the basis for a preliminary engineering design.



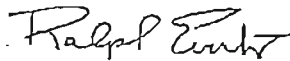
5.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of the City of Richmond and their agents. Hay & Company Consultants (Hayco), a Division of EBA Engineering Consultants Ltd., does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than the City of Richmond, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in EBA's Services Agreement and in the General Conditions provided in Appendix B of this report.

6.0 CLOSURE

We trust this report meets the requirements of the City of Richmond. If you have any questions, please do not hesitate to contact the undersigned.

Sincerely,
Hay & Company Consultants
A Division of EBA Engineering Consultants Ltd.



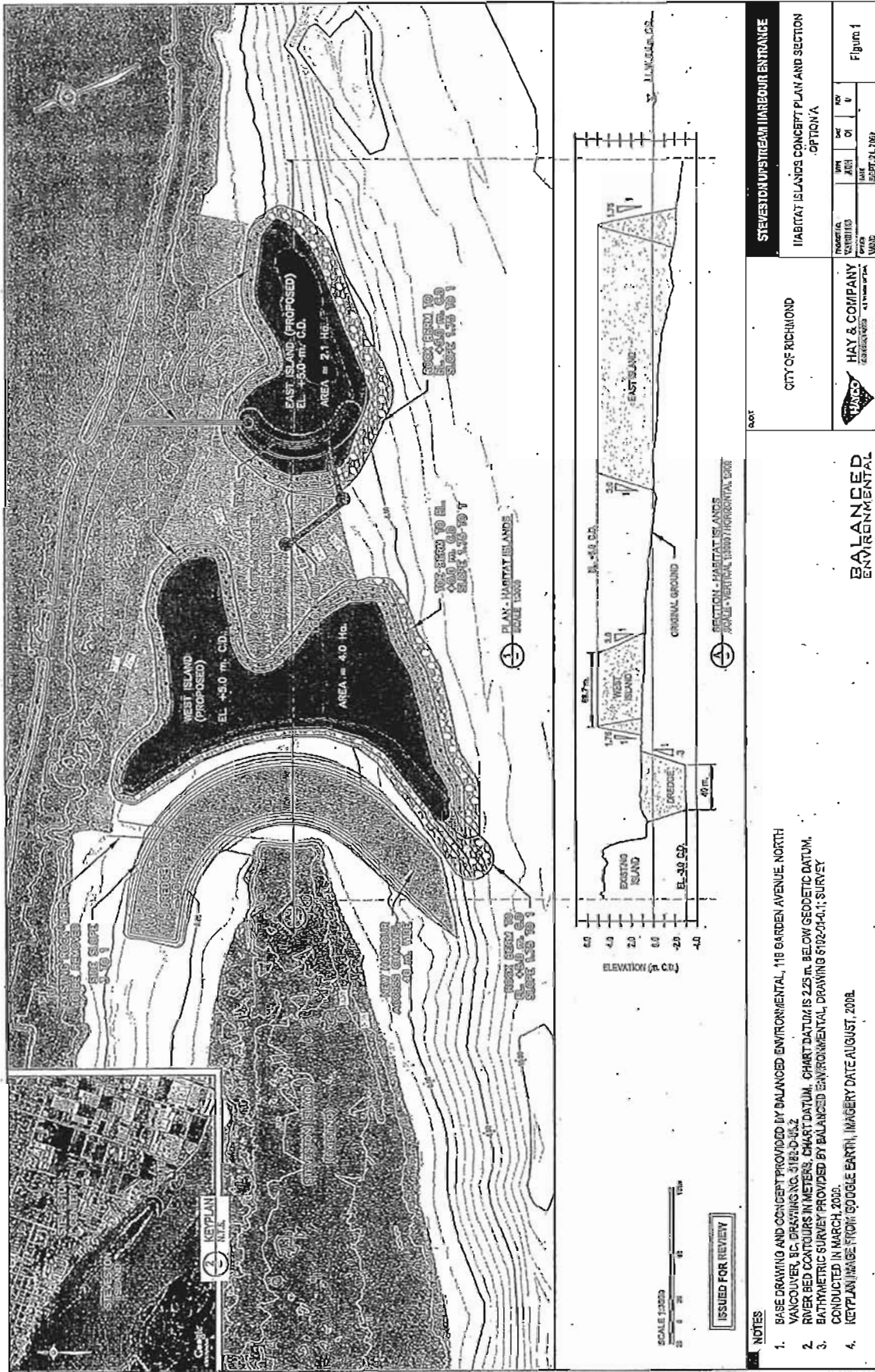
Ralph Everts, P.Eng.
Project Director
Ports & Harbours Practice
Direct Line: 604.875.6391 x248
reverts@hayco.com

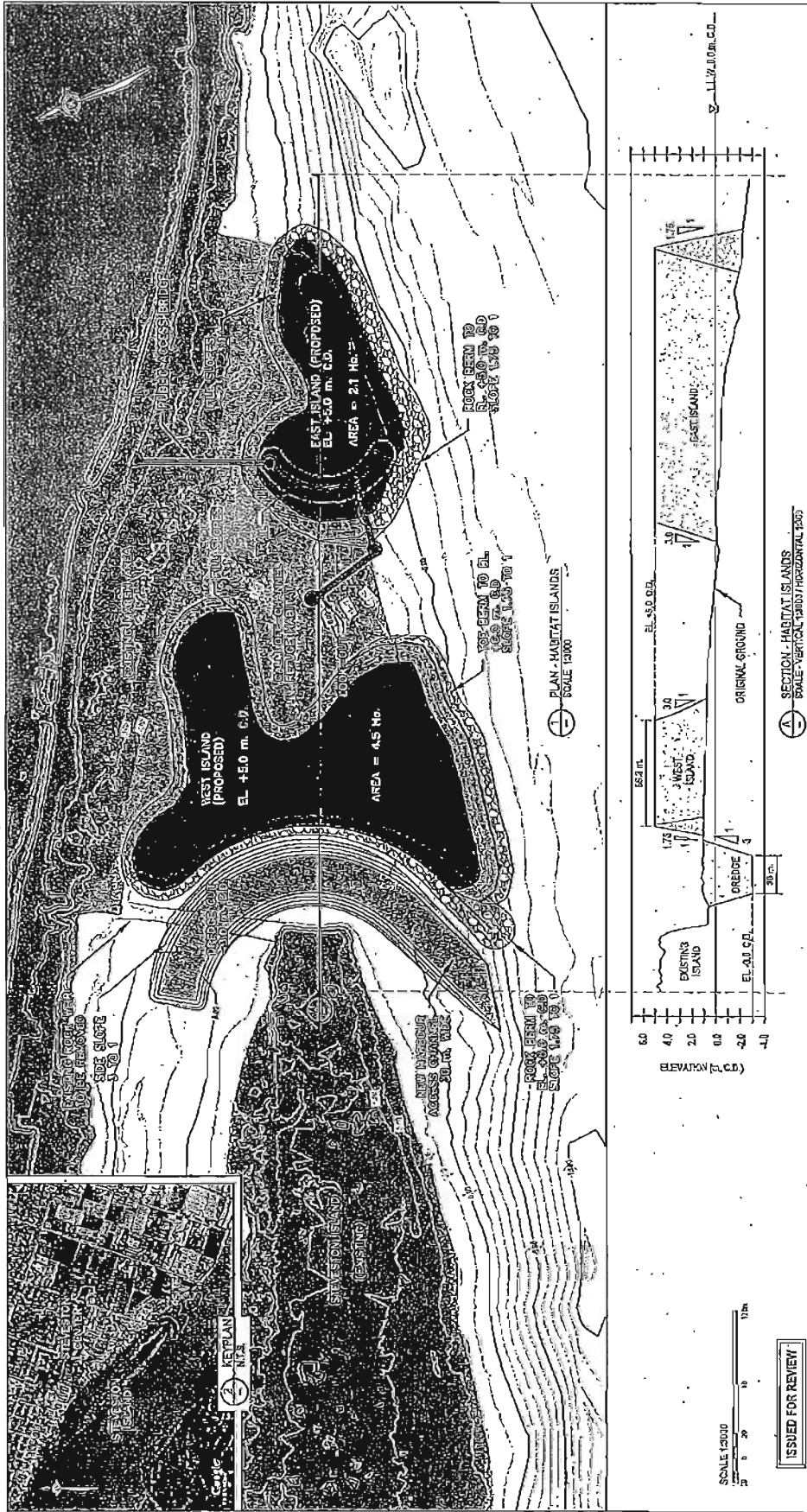
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FIGURES







STEWESTON UPSTREAM HARBOUR ENTRANCE HABITAT ISLANDS CONCEPT PLAN AND SECTION OPTION B		CITY OF RICHMOND HAY & COMPANY CONSULTING ARCHITECTS		PROJECT NO. 6182-3-402.2 DATE: SEPT. 24, 2009
PREPARED BY: J. HAY CHECKED BY: J. HAY DATE: SEPT. 24, 2009	DRAWN BY: J. HAY CHECKED BY: J. HAY DATE: SEPT. 24, 2009	SCALE: VERTICAL 1:500 / HORIZONTAL 1:500	SHEET NO. 1 OF 1	FIGURE 2

APPENDIX

APPENDIX A HAYCO'S PROPOSAL LETTER



ISSUED FOR USE

CREATING AND DELIVERING BETTER SOLUTIONS

www.hayco.com

August 18, 2009

Hayco File: PV31101113

City of Richmond
6911 No. 3 Road
Richmond, BC V6Y 2C1

Attention: Mr. John Irving, P.Eng.
Director, Engineering

Dear Sir:

Subject: Steveston Harbour Upstream Entrance Modification

This will refer to our telecom of August 10, 2009 (Isfeld/Irving) in which amendments to the Hayco proposal of July 13, 2009 were discussed. Based on the level of effort envisaged by the City of Richmond by which the feasibility assessment would be limited to providing an order of magnitude project costing, Hayco hereby offers the following package of engineering and environmental services:

1. Hydraulic Feasibility and Stability Assessment:
 - Utilize previous modelling outputs to estimate sideslope stability and armouring requirements.
 - Utilize existing geotechnical data for the area to estimate effects and stability of proposed reclamation.
 - Allow \$5,000.00
2. Finalize a concept base plan, utilizing the outline of reclamation prepared by Balanced Environmental. Ensure reasonable conformity with the configuration of control structures previously tested on the Hayco numerical hydraulic model for Small Craft Harbours:
 - Allow \$2,000.00
3. Conceptualize public amenities including a bidge access, walkway and public viewing platform.
 - Allow \$2,500.00
4. Assess feasibility of potential reclamation methodology through discussions with contractors and operators on the river, taking account of available dredgeate materials and methods of delivery.
 - Allow \$2,000.00
5. Environmental Design and Habitat Creation.

This task will include:

 - Co-ordinate transfer of assumed site data for a base plan to be prepared by Hayco;
 - Determine species and target areas to optimize habitat creation;

201-52191-0000-Appendix A-Proposal for Steveston Harbour Modification.doc

HAY & COMPANY CONSULTANTS - A Division of EBA Engineering Consultants Ltd.
p. 604.875.8391 • f. 604.875.8363
#900 • 1088 West Hastings Street • Vancouver, British Columbia V6E 3X2 • CANADA



- Mould the target habitat areas into practical locations, given the constraints of material stability, side slopes, plant elevations, biodiversity, species at risk, construction methodology, plant availability and seeding methods. This exercise will form the basis for cost estimating;
 - Consider impacts of proposed public amenities;
 - Present two schemes for habitat credit, i.e. most costly and least costly;
 - Discuss feasibility implications of the above factors in terms of approvals, habitat credits and design of more definitive concept.
- Allow \$8,500.00

6. Cost estimation, report preparation and consultation with client.

The report will include a discussion of the feasibility assessment findings, the effect on estimated costs, the analysis required to produce a preliminary engineering design, and discussion of the draft report with the client prior to submission.

- Allow \$5,000.00

7. Clerical and Disbursements:

- Allow \$ 400.00

Total, excluding GST = \$25,400.00

Sincerely,

Hay & Company Consultants

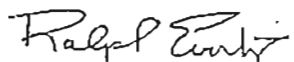
(a division of BBA Engineering Consultants Ltd.)

Prepared by:

Authorized by:



E.O. Isfeld, P.Eng.
Senior Marine Engineer
Direct: 604.875.6391 x249
oisfeld@hayco.com



Ralph Everts, P.Eng.
Principal / Senior Design Engineer
Direct Line: 604.875.6391 x248
reverts@hayco.com

EOI/tbt



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V31101113
February 2010

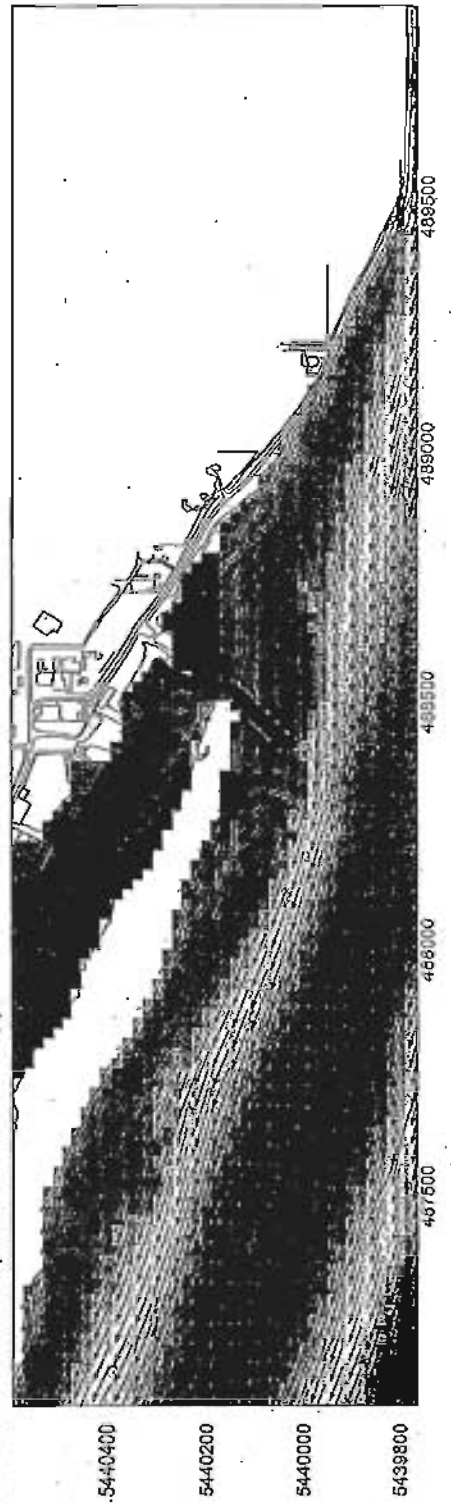


APPENDIX

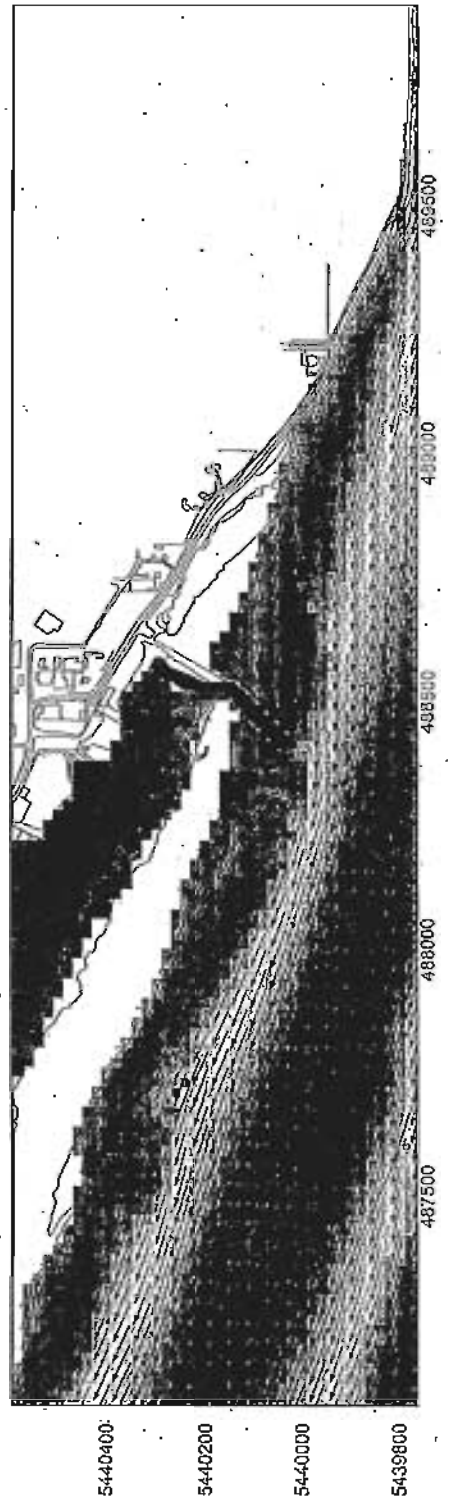
APPENDIX B - HAYCO'S SEDIMENT CONTROL MODEL RESULTS



DEPTH: 0 TO 1.5 m GCD (to 0.7 m above LLW)



DEPTH: 1.5 TO 3.0 m GCD (to 0.8 m below LLW)



LEGEND

CLIENT

CITY OF RICHMOND

STEVESTON UPSTREAM
HARBOUR ENTRANCE

VELOCITY FLOW FIELDS
EXTRACTED FROM PREVIOUS
MODEL STUDY RESULTS

NOTES

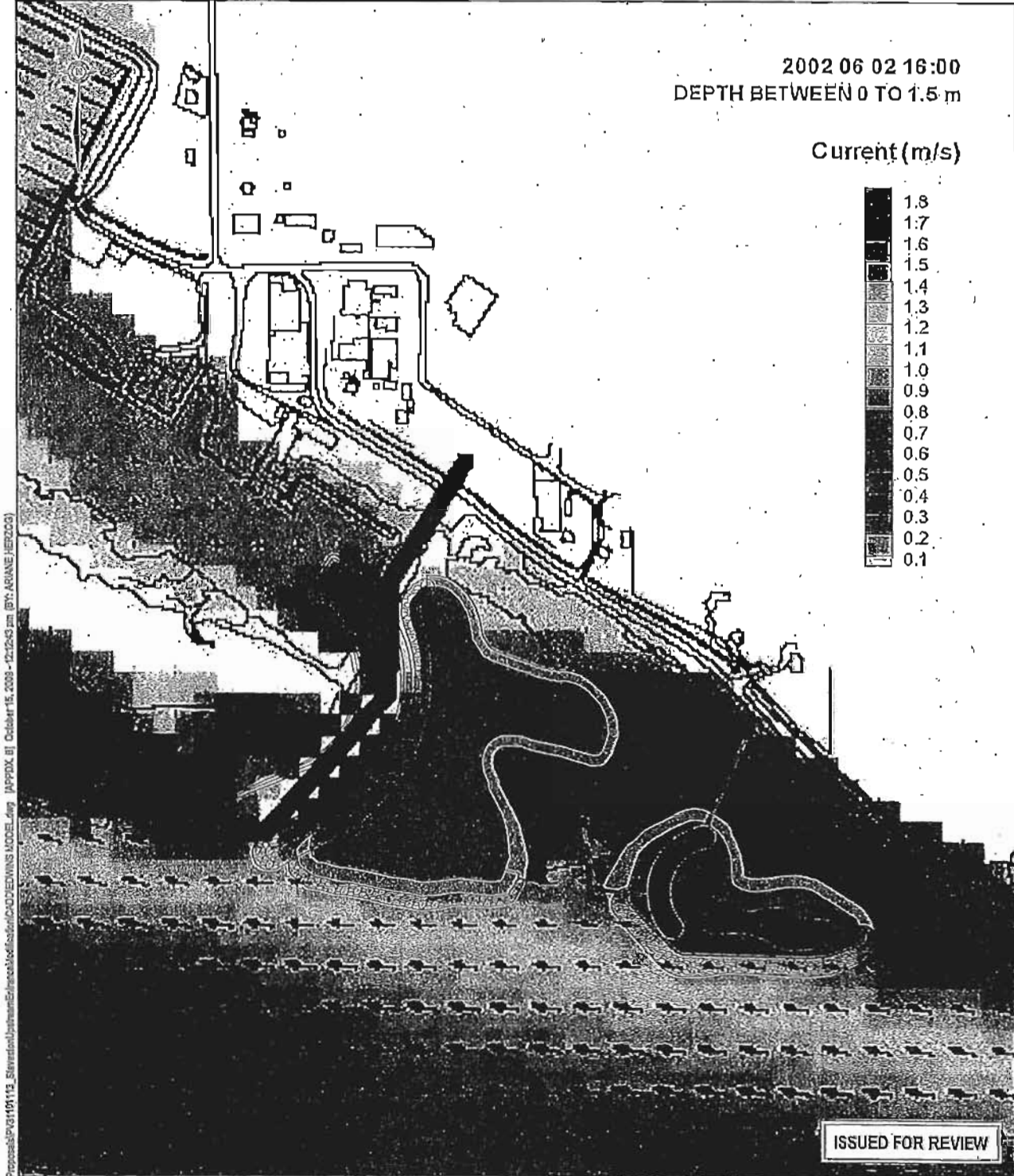
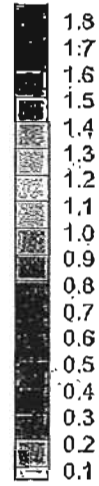
HAYCO
CONSULTANTS
A DIVISION OF EBA

PROJECT NO.	DW/	C/O	REV
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EBA-VANC	October 2009		

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 DEPTH BETWEEN 0 TO 1.5 m

Current (m/s)



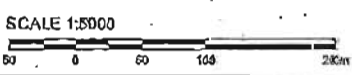
ISSUED FOR REVIEW

LEGEND/NOTES

CITY OF RICHMOND

STEVESTON UPSTREAM HARBOUR ENTRANCE

HABITAT ISLANDS CONCEPT
 AND FLOW VELOCITY MODEL



HAY & COMPANY
 CONSULTANTS A DIVISION OF H&C

PROJECT NO. V31501113	DWN A01/VIEW	CHK 01	PRG 0
OFFICE VANC	DATE OCT, 2003		

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APPENDIX

APPENDIX C HAYCO'S ASSESSMENT OF THE STABILITY OF THE PROPOSED RECLAMATION



Stability Overview

Hayco/BBA completed an assignment for the City of Richmond under which the seismic stability and performance of the Fraser River dyke located between No. 4 and 5 Roads was assessed. The study included advanced modelling and prediction of post-seismic movements of the dyke system in order to perform an option assessment considering the flood risks and costs of ground improvement.

Geotechnical concerns stem from the fact that the area is underlain by soft silts and potentially liquefiable sands. These soil conditions limit the superimposed loading from structures such as the proposed public access bridge as well as the proposed fills, and gravel or quarried rock /berms.

In particular, geotechnical issues/risks include:

1. long-term settlement and/or bearing failure of the proposed reclamation area due to consolidation of compressible clay/silt layers present at the site which may require placement of additional fill to compensate for the large-scale settlement of the area; and,
2. seismic performance of the proposed fill/berms to be placed on the existing loose sand layers which will undergo significant movements and/or failure due to earthquake shaking and liquefaction.

Detailed assessment will be required to determine the rock berm side-slopes as well as other ground improvement measures to meet the performance criteria under normal working and seismic loading conditions. Procedures, extent and pattern of ground densification necessary to improve the seismic performance of the site will be described and cost estimates will be provided in the next stages of the design.

The performance criteria should be established in close interaction with the City of Richmond based on an assessment of risks and consequences. Depending on the component under consideration, i.e. the proposed islands and the access bridges, life safety and/or economic impacts should be considered.





APPENDIX

APPENDIX D BALANCED ENVIRONMENTAL'S ENHANCEMENT FEATURES FEASIBILITY STUDY



APPENDIX D

ENHANCEMENT FEATURES FEASIBILITY STUDY, STEVESTON HARBOUR EAST ENTRANCE, RICHMOND, BRITISH COLUMBIA

SECTION 1 - PRELIMINARY ENVIRONMENTAL DESIGN

1.1 Introduction

Marshes are some of the most ecologically diverse communities in the world. They are home to a variety of fish, birds, plants, invertebrates, mammals, amphibians, and are stopping grounds for a vast array of migratory species en-route to the nesting grounds of the north. Human development has resulted in the destruction of acres of these habitat features over the past 100 years resulting in significant accumulative environmental impacts that have trickled up the food chain, directly adversely impacting local fisheries and the economy itself. Restoration efforts to restore the lost functions of marshes along our coast should be a priority to ensure our way of life is persevered for future generations. By creating new functional marsh features, the City of Richmond would be taking a proactive approach to improving the environment through the creation of high value habitat.

Steveston is located at the mouth of the Fraser River. Tidal saltwater mixes with freshwater to create a unique brackish environment for local wildlife. A fusion of saltwater species and freshwater species occur here, resulting in high biodiversity. The transition also allows juvenile salmon to acclimate to saltwater. Off-channel habitats and marshes provide key habitat functions to these species.

Because of the unique location, marsh restoration efforts should focus on creating the following types of habitat to maximize functionality of the site:

- Off-channel fish habitat
- Brackish marsh habitat
- Riparian fringe habitat (backshore vegetation)
- Freshwater wetlands

All of the above have been incorporated into the habitat concept shown on Drawing 5192-D-01.1, which involves the construction of two new islands at the east end of Shady Island (Steveston Island) on the Fraser River.

1.2 Off-Channel Fish Habitat

1.2.1 General

Functional off-channel fish habitat typically use some or all of the below features:

- A muddy seabed
- A marsh perimeter
- A riparian fringe
- Shallow water depth
- Narrow channels with lengthy perimeters
- Woody debris (logs)

The off-channel fish habitat shown on Drawing 5192-D-01.1 will contain all of the above features.

1.2.2 Newly Constructed Area

Drawing 5192-D-01.1 shows the creation of 32,165 m² of new off-channel fish habitat. The area will be created by the construction of the two islands as shown, which will provide wave protection, nutrients, and shelter for the off-channel areas shown. The area includes the side slopes of the new island features up to the lower elevation of the proposed and existing marshes.

The side slopes of the islands have not been designed at this stage. Future investigation by a hydraulic engineer with hydraulic modelling capabilities may be required to determine the slope and material size that will allow the proposed islands to be stable. Non-riprap shorelines are preferred wherever possible from a habitat perspective.

1.3 Brackish Marsh

1.3.1 General

Brackish marsh construction requires consideration of the following factors:

- Proximity to freshwater
- Abundance of sunlight
- Wave protection
- Correct distribution and layering of organics, clay, silt, and sand
- Elevation for target marsh species
- Growing medium thickness
- Correct slope for soil stability
- A source for propagation

1.3.2 Areas Created

Drawings 5192-D-02.1 and 02.3 shows the preliminary brackish marsh planting scheme for the East Island and West Islands, respectively. The East Island will have 2,949 m² of marsh and the West Island will have 22,606 m² of marsh. The total area of brackish marsh for the two islands combined is 25,555 m². These newly created areas will serve as high value fish habitat.

The areas described above may become adjusted during the actual design stages of the project due to island side-slope design criteria determined by the hydraulic engineer. For example, if it is determined that a side slope of 3 horizontal to 1 vertical cannot sustain stable brackish marsh growing medium, marsh plants may not be capable of surviving on these side slopes and the area of brackish marsh would decrease.

1.3.3 Target Plant Species and Elevations

The marsh design shall focus on including equal distribution of elevation ranges for the following key species:

Table 1.1 – Key Indicator Species Elevations for the Steveston Marsh

Common Name	Scientific Name	Lower Elevation	Upper Elevation
Dunegrass	<i>Elymus mollis</i>	3.7m CD	5.0m CD
Creeping Spikerush	<i>Eleocharis palustris</i>	1.7m CD	2.0m CD
Soft-stemmed Bulrush	<i>Scirpus lacustris</i>	2.1m CD	3.7m CD
Lyngby's Sedge	<i>Carex lyngbyei</i>	1.7m CD	2.8m CD
Beach Pea	<i>Lathyrus japonicus</i>	3.8m CD	5.2m CD
Arctic Rush	<i>Juncus arcticus</i>	2.7m CD	3.8m CD
Pacific Silverweed	<i>Potentilla pacifica</i>	3.8m CD	4.5m CD
Sea Arrowgrass	<i>Triglochin maritimum</i>	2.5m CD	3.0m CD
Spearscale	<i>Atriplex patula</i>	3.8m CD	4.5m CD

A station (nail) has been installed on the south-west corner of the wharf immediately west of the site. The elevation was measured in comparison to the tide and determined to be 5.18m Chart Datum. All plant elevations provided are in reference to this location, and should be used during construction to determine growing elevations.

All growing boundaries should be established during construction to within +/- 5 cm accuracy.

1.2 Off-Channel Fish Habitat

1.2.1 General

Functional off-channel fish habitat typically use some or all of the below features:

- A muddy seabed
- A marsh perimeter
- A riparian fringe
- Shallow water depth
- Narrow channels with lengthy perimeters
- Woody debris (logs)

The off-channel fish habitat shown on Drawing 5192-D-01.1 will contain all of the above features.

1.2.2 Newly Constructed Area

Drawing 5192-D-01.1 shows the creation of 32,165 m² of new off-channel fish habitat. The area will be created by the construction of the two islands as shown, which will provide wave protection, nutrients, and shelter for the off-channel areas shown. The area includes the side slopes of the new island features up to the lower elevation of the proposed and existing marshes.

The side slopes of the islands have not been designed at this stage. Future investigation by a hydraulic engineer with hydraulic modelling capabilities may be required to determine the slope and material size that will allow the proposed islands to be stable. Non-riprap shorelines are preferred wherever possible from a habitat perspective.

1.3 Brackish Marsh

1.3.1 General

Brackish marsh construction requires consideration of the following factors:

- Proximity to freshwater
- Abundance of sunlight
- Wave protection
- Correct distribution and layering of organics, clay, silt, and sand
- Elevation for target marsh species
- Growing medium thickness
- Correct slope for soil stability
- A source for propagation

1.3.2 Areas Created

Drawings 5192-D-02.1 and 02.3 shows the preliminary brackish marsh planting scheme for the East Island and West Islands, respectively. The East Island will have 2,949 m² of marsh and the West Island will have 22,606 m² of marsh. The total area of brackish marsh for the two islands combined is 25,555 m². These newly created areas will serve as high value fish habitat.

The areas described above may become adjusted during the actual design stages of the project due to island side-slope design criteria determined by the hydraulic engineer. For example, if it is determined that a side slope of 3 horizontal to 1 vertical cannot sustain stable brackish marsh growing medium, marsh plants may not be capable of surviving on these side slopes and the area of brackish marsh would decrease.

1.3.3 Target Plant Species and Elevations

The marsh design shall focus on including equal distribution of elevation ranges for the following key species:

Table 1.1 – Key Indicator Species Elevations for the Steveston Marsh

Common Name	Scientific Name	Lower Elevation	Upper Elevation
Dunegrass	<i>Elymus mollis</i>	3.7m CD	5.0m CD
Creeping Spikerush	<i>Eleocharis palustris</i>	1.7m CD	2.0m CD
Soft-stemmed Bulrush	<i>Scirpus lacustris</i>	2.1m CD	3.7m CD
Lynghy's Sedge	<i>Carex lynghyei</i>	1.7m CD	2.8m CD
Beach Pea	<i>Lathyrus japonicus</i>	3.8m CD	5.2m CD
Arctic Rush	<i>Juncus arcticus</i>	2.7m CD	3.8m CD
Pacific Silverweed	<i>Potentilla pacifica</i>	3.8m CD	4.5m CD
Sea Arrowgrass	<i>Triglochin maritimum</i>	2.5m CD	3.0m CD
Spearscale	<i>Atriplex patula</i>	3.8m CD	4.5m CD

A station (nail) has been installed on the south-west corner of the wharf immediately west of the site. The elevation was measured in comparison to the tide and determined to be 5.18m Chart Datum. All plant elevations provided are in reference to this location, and should be used during construction to determine growing elevations.

All growing boundaries should be established during construction to within +/- 5 cm accuracy.

1.3.4 Base Material Placement and Requirements

Base material shall be placed by suction dredge. Base material must pass Environment Canada Ocean Dumping criteria. This may include sand from maintenance-dredged locations.

The base material will be required to harden such that heavy machinery can contour the site prior to placement of the growing medium.

1.3.5 Contouring

A land-based plough will perform contouring during periods of low tide. Contours shall adhere to those provided on the final design drawings. Contouring will allow for placement of growing medium. Drainages shall be constructed at the low points to ensure water, which may trap fish and other organisms, can escape during receding tides.

1.3.6 Growing Medium Requirements

A minimum of 30 cm and maximum of 100 cm of growing medium shall be placed over the entire area designated for new marsh. The growing medium shall consist of dredged material from the adjacent harbour entrance. With consideration to the types of plants listed in Table 1.1, except Dunegrass and Beach Pea, the following growing medium requirements will have the highest success rate:

- | | |
|---|--------------|
| • Gravel (greater than 2mm, less than 75mm) | 0-10% |
| • Sand (greater than 0.05mm, less than 2mm) | 30-60% |
| • Silt (greater than 0.002mm, less than 0.05mm) | 20-50% |
| • Clay (less than 0.002mm) | 10-40% |
| • Organic content | 10-30% |
| • Acidity | 5.0 - 6.5 pH |

For Dunegrass and Beach Pea, riparian growing medium requirements should be used (see Section 1.4.6).

1.3.7 Transplanting

Transplanting shall conform to the following criteria:

- Plugs to be between 15 and 30 cm diameter
- Plug height to be between 15 and 30 cm diameter
- Plugs to be placed at a minimum 2 plugs per m²
- Plugs to be arranged such that each plant is placed within its corresponding growing elevation shown in Table 5.1.
- Plugs to be planted in the early spring or late fall
- The entire root ball shall be placed below the surface.
- Plugs shall not remain out of the ground for longer than 24 hours

1.3.8 Maintenance

There is a chance that soil erosion may occur in exposed areas. These areas will either require routine placement of material, protection from waves and currents, or may be lost as functional areas.

1.4 New Riparian Areas

1.4.1 General

To construct a successful riparian area, the following conditions are required:

- A well drained, aerated growing medium
- Elevation near high water (see planting list)
- Proper rooting depth
- A stable slope
- A source for propagation

1.4.2 Riparian Length and Areas

The proposed riparian areas for the East and West Islands are shown on Drawings 5192-D-02.1 and 03.1, respectively. The total length of fringe riparian vegetation created is 889m on the East Island and 1,595m on the West Island, totalling 2,484m.

Two types of planting are proposed: high density and low density planting. The high density areas are located on the East Island and represent a 5 m wide strip adjacent to watercourses or public amenities. The lower density planting areas are proposed for all other inland areas on the East Island, and all riparian areas on the West Island.

The high-density areas conform to the Ministry of Environments planting guidelines for riparian areas. Following these criteria are only cost-feasible over small areas due to the 1m spacing requirement. These areas visually resemble an established riparian area more closely than low density planting areas. Therefore, to save cost, high density planting is only proposed in areas near public amenities.

Lower-density planting (1 plug per every 5 m) will be effective in establishing riparian vegetation in the long term, however will take longer to become established. As this density more accurately reflects tree density than the higher density planting schemes, these riparian areas will function similar to natural distributions. Visually they will be less impressive initially, and therefore have been placed further from public amenities.

1.4.3 Target Plant Species and Elevations

Table 1.2 – Key Riparian Species Elevations

Common Name	Scientific Name	Lower Elevation	Upper Elevation
Nootka Rose	<i>Rosa nootkana</i>	4.1m CD	> 5.2m CD
Black Hawthorn	<i>Crataegus douglasii</i>	5.2m CD	> 5.2m CD
Pacific Willow	<i>Salix lucida</i>	4.5m CD	> 5.2m CD
Scouler's Willow	<i>Salix scouleriana</i>	4.5m CD	> 5.2m CD
Beaked Hazelnut	<i>Corylus cornuta</i>	5.0m CD	> 5.2m CD
Oceanspray	<i>Holodiscus discolor</i>	4.5m CD	> 5.2m CD
Salal	<i>Gaultheria shallon</i>	5.0m CD	> 5.2m CD
Black Twinberry	<i>Lonicera involucrata</i>	4.5m CD	> 5.2m CD
Salmonberry	<i>Rubus spectabilis</i>	4.5m CD	> 5.2m CD
Red Elderberry	<i>Sambucus racemosa</i>	5.2m CD	> 5.2m CD
Snowberry	<i>Symphoricarpos albus</i>	5.0m CD	> 5.2m CD
Hardback	<i>Spiraea douglasii</i>	4.5m CD	> 5.2m CD
Black Cottonwood	<i>Populus trichocarpa</i>	4.5m CD	> 5.2m CD
Red Alder	<i>Alnus rubra</i>	4.5m CD	> 5.2m CD
Bigleaf Maple	<i>Acer macrophyllum</i>	5.0m CD	> 5.2m CD
Western Red Cedar	<i>Thuja plicata</i>	5.0m CD	> 5.2m CD
Vine Maple	<i>Acer circinatum</i>	5.0m CD	> 5.2m CD
Pacific Crabapple	<i>Malus fusca</i>	4.5m CD	> 5.2m CD
Bitter Cherry	<i>Prunus emarginata</i>	5.0m CD	> 5.2m CD

A station (nail) has been installed on the south-west corner of the wharf immediately west of the site. The elevation was measured in comparison to the tide and determined to be 5.18m Chart Datum. All plant elevations provided are in reference to this location, and should be used during construction to determine growing elevations.

1.4.4 Base Material Placement and Requirements

All base materials to be placed with suction dredge as previously discussed.

1.4.5 Contouring

A land-based plough shall perform contouring. Contours shall allow for a natural appearance, leaving the surface within +/- 1 meter of the elevations shown on the final design drawings. Contours should allow for flow towards drainage areas as shown on the attached drawings.

1.4.6 Growing Medium Requirements for Riparian Site

With consideration to the types of plants listed in Table 1.2, the following growing medium requirements will have the highest success rate.

- | | |
|---|--------------|
| • Gravel (greater than 2mm, less than 75mm) | 0-10% |
| • Sand (greater than 0.05mm, less than 2mm) | 50-70% |
| • Silt (greater than 0.002mm, less than 0.05mm) | 10-30% |
| • Clay (less than 0.002mm) | 10-20% |
| • Organic content | 10-30% |
| • Acidity | 5.0 – 6.5 pH |

Growing medium soil shall be tested such that no visible water is present 120 minutes after a rain event of moderate to heavy intensity of at least 10 minutes. Growing medium shall not be compacted by heavy machinery and have a rough surface to promote colonization by native plants and reduce sediment and erosion. Growing medium that does not meet the above requirements may still support some local plant species, however results may vary for each species.

1.4.7 Planting

The following planting criteria may be required:

- Plants obtained from a credible plant nursery carrying native plants
- No. 2 pot size for high-density areas / combination of staking and No.2 pot size for low-density areas. In some cases seedlings may be used.
- Spacing 1 shrub/tree every 1 metre in high density areas (see attached drawings)
- Spacing 1 shrub/tree every 5 metres in low density areas (see attached drawings)
- Plant types to be distributed evenly
- Planting to occur in early spring or late fall
- Irrigation may be required for the first year of growth
- Mulching may be required, but should be avoided adjacent to watercourses if it will not decompose naturally or produce leachate that might enter the watercourse.

1.4.8 Maintenance

After the first year, a crew of labourers should remove any invasive species which have colonized the site. This will be required until plant densities become established to levels that will out compete invasive species.

1.5 Freshwater Wetland Feature

1.5.1 General

Freshwater wetlands provide valuable habitat for a variety of species. To increase biodiversity at the site and better serve species present, a freshwater wetland feature is also proposed (see new water feature on drawing 5192-D-02.1).

5.5.2 Areas Created

A 3,503 m² new freshwater feature is proposed for the East Island.

5.5.3 Contouring

The inner side-slope will slope down at shallower than a 3:1 slope. The base material shall be clay, 0.5m thick over the entire area designated for wetland. A plough or other suitable heavy equipment shall place the material. The lowest point around the perimeter should be higher than 4.5m Chart Datum to ensure that fish do not enter the system and become trapped should the system dry up during the summer.

1.6 Environmental Impacts And Benefits

1.6.1 Off-Channel Fish Habitat

The environmental impacts of constructing off-channel fish habitat features will be as follows:

- Permanent loss of water column
- Permanent loss of sandy riverbed habitat
- Temporary generation of turbidity during construction
- Temporary disruption to local fish populations from equipment

A variety of juvenile fish, such as Coho salmon, use the Fraser River Estuary as a stopping ground to become acclimated to saltwater on their seaward migration. They prefer areas of slower velocity water that are protected from predators and abundant in food. These conditions are provided by off-channel habitats.

1.6.2 Intertidal Marsh

The environmental impacts of constructing the marsh features will be as follows:

- Permanent loss of water column
- Permanent loss of sandy river habitat
- Temporary generation of turbidity during construction
- Temporary disruption to local fish populations from equipment

Brackish marsh habitat provides shelter for juvenile fish from predators during periods of inundation. It also is home to a variety of invertebrates which provide food to juvenile fish, birds, and other wildlife. Marshes improve water quality by slowing water flow and allowing the deposition of fines and also uptake of hydrocarbons and other deleterious substances. Marshes provide natural shoreline stabilization with their root structures, avoiding the need for unnatural riprap shorelines.

1.6.3 Riparian Area

The environmental impacts of constructing the riparian features will be as follows:

- Permanent loss of water column
- Permanent loss of sandy river habitat
- Temporary generation of turbidity during construction
- Temporary disruption to local fish populations from equipment

A riparian fringe along a watercourse is an important component of an ecosystem. Riparian areas contribute large woody debris, insect drop, detritus and shade to the neighbouring watercourse. They also provide natural slope stability and improve water quality. A variety of raptors and other birds live, feed, and nest along riparian areas.

1.6.4 Freshwater Wetland Habitat

Construction of the fresh water habitat feature will result in the following environmental impacts:

- Permanent increase of water column
- Less space for construction of riparian habitat
- Temporary generation of turbidity during construction

The fresh water habitat feature will provide habitat for freshwater amphibians and invertebrates, providing food for a variety of bird species and other organisms.

1.7 Habitat Value For Off-Site Compensation

Balanced Environmental Services Inc. performed a biophysical survey of the site as part of their preliminary habitat review of Steveston Harbour in 2009. The work was performed for Fisheries and Oceans Canada -- Small Craft Harbours Branch (SCH), and provides baseline data that can be used to determine the environmental impacts of proposed works in these areas.

The biophysical survey identified physical and biological conditions at the site, including generating a detailed species list of organisms observed, and accurate topographical data referenced to Chart Datum.

The footprint of the proposed habitat features will avoid all critical marsh habitat identified in the biophysical survey. The majority of the footprint will be placed over sand flat with low biodiversity.

The following is a summary of habitat areas lost or created by the proposed enhancement feature:

Table 1.3. Habitat Balance Sheet

Habitat Type	Pre m ²	Post m ²	Net m ²
Dredge Cut Bottom	0	11030	11030
Dredge Side Slope	0	6798	6798
Riprap	0	11483	11483
Riparian	0	28592	28592
Fresh Water	0	3503	3503
Marsh	0	25555	25555
Off-Channel	0	32165	32165
Trail / Lawn	0	2898	2898
Unprotected Sandy Bottom	-123675	1651	-122023

While the project results in a loss of 123,675 m² of sandy riverbed, the equivalent area of high value habitat will be created.

To determine the amount of habitat credits are available, the Balanced Environmental Units (BEU) can be calculated as follows:

Table 1.4. Habitat Credit Calculations

Habitat Type	Pre m ²	Post m ²	Net m ²	H	A	Value beu
Dredge Cut Bottom	0	11030	11030	1	1	11030
Dredge Side Slope	0	6798	6798	1	1	6798
Riprap	0	11483	11483	0.5	2.5	14353
Riparian	0	28592	28592	2	1	57183
Fresh Water	0	3503	3503	6	1	21016
Marsh	0	25555	25555	6	1	153330
Off-Channel	0	32165	32165	3	1	96496
Trail / Lawn	0	2898	2898	0.1	1	290
Unprotected Sandy Bottom	-123675	1651	-122023	1	1	-122023
					Net	238,473

H = Habitat Factor, A = Area Factor, BEU = Balanced Environmental Unit.

While BEU's have been used in a variety of Environmental Impact Assessments and Fisheries Act Authorizations, the values are subjective and are negotiated on a project by project basis, therefore Fisheries and Oceans Canada (DFO) does not endorse their use. However, they do provide a rough means of calculating habitat credits for a project prior to DFO review.

Using the beu calculations, the proposed enhancement area would result in a net habitat credit of + 238,473 beu, which could be applied to other projects in the area.

The amount of credit required by a project will depend on the type of habitat being impacted. For example, if critical habitat such as eelgrass is destroyed, DFO will require 2:1 like for like habitat compensation to offset those impacts. Only if it can be demonstrated that this form of compensation on site is not possible, can offsite locations be considered. If offsite like for like is not available, only then can habitat credits be used, and often will require it in the form of high value fish habitat such as new marsh. In that case, the proposed enhancements would compensate for a project footprint of 30,600 m².

The majority of projects which do not adversely affect critical habitat will be more favourable as options to purchase the above habitat credits. Some projects have required that 1:1 mud lost to new habitat created be implemented for compensation, and 2:1 mud lost to new marsh as compensation. Under these circumstances, the construction of the proposed enhancement features would be able to compensate for a project with an intertidal or subtidal footprint of up to 150,000 m².

Therefore, construction of the proposed enhancement features may provide compensation credits for other projects ranging in footprint size from 30,600 m² to 150,000 m² depending on the impacts of the proposed project. As the enhancement will create high-value critical habitat in the Fraser River Estuary, enhancements to this location may be able to compensate for more than that typically observed along our coast in other locations, therefore the footprints described above may be larger than projected. To determine the actual value of the habitat created, negotiation with DFO will be required (on a project by project basis).

SECTION 2 - COST

2.1 Costing Assumptions

To determine the cost of contouring and planting of the proposed habitat features, the following assumptions have been made:

- Only 1 metre of material will need to be handled by the plough after placement by suction dredge.
- Only areas designated as riparian, marsh, and a 2 metre wide strip along the toe of the marsh, will need to get contoured.
- Dense planting, as per the Ministry of Environment Guidelines, will only be required near public amenities.
- All materials, such as clay, sand, silt, etc, are delivered and in close proximity such that they do not require an excavator or dump truck to move or place.
- A site supervisor and environmental monitor will only spot-check the work.
- The work will only require a few surveying site visits.

2.2 Costing Calculations

Detailed costing calculations for contouring and planting are shown below in Table 2.1.

Table 2.1. Contouring and Planting Cost Analysis

East Island

Activity	Area m ²	Volume m ³	Rate	Cost
Contouring				
Plough	19824	19824	5	\$99,119
Engineering Inspection				\$10,000
Surveying				\$10,000
Monitoring				\$10,000
Planting				
1m Density	6760		16	\$108,157
5m Density	4737		3	\$14,212
Grass	2484		0.01	\$25
Marsh	2949		10	\$29,494
			subtotal	\$281,007

West Island

Activity	Area	Volume	Rate	Cost
Contouring				
Plough	39700	39700	5	\$198,500
Engineering Inspection				\$10,000
Surveying				\$10,000
Monitoring				\$10,000
Planting				
1m Density			16	\$0
5m Density	17094		3	\$51,283
Grass			0.01	\$0
Marsh	22606		10	\$226,056
			subtotal	\$505,839

Off-Channel

Activity	Length	Width	Rate	Cost
Contouring	28350	56700	5	\$283,500
			Total	\$1,070,347

2.3 Costing Discussion

Costs are expected to vary considerably with the ability of the contractors to place the bedding material. The closer the bedding material is placed to the proposed contours the less costs will be required for contouring. For example, if bedding material is placed to within 0.5m of that required by contouring, the cost estimate would be \$150,000 cheaper.

In addition, as the work is performed in a tidal environment, part of the work will require working at different times of the day. The above cost estimate does not include extras imposed by contractors to work around the tides.

The cost to perform the planting can be reduced through the purchasing of stakes rather than No.2 plants in the low plant density areas - additional savings of up to \$30,000. However, the labour required to plant varies and will depend on who performs the work.

If additional equipment, such as excavators and dump trucks, are required, the costs will be significantly higher than projected. Additional requirements necessary to fulfill permits obtained from regulatory agencies, such as DFO, may increase actual project costs. For example, DFO may increase the plant density of low planting areas, ask for additional mitigation measures, etc.

In general, the cost to perform the contouring and planting will be of the order of magnitude of \$1,000,000.

SECTION 3 - SIGNATURES

3.1 General

Balanced Environmental Services Inc. declares that qualified environmental professionals acting within their areas of expertise have duly prepared the attached work.

Report By:

Reviewed By:

Warren Appleton, RPBio
Biologist
Balanced Environmental Services Inc.

Scott Christie, RPBio
President
Balanced Environmental Services Inc.

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5182-E-02.2 EAST MARSH SPECIES LIST.XLS

Table 1: Plant Species Commonly Observed in Brackish Marsh East of Steveston Harbour
and Shady Island, Steveston, B.C.

Date: August 27, 2009

Common Name	Scientific Name	Range*		Abundance**
		Upper	Lower	
Algae, Green				
Green String Lettuce	<i>Phalaris arundinacea</i>	4.2	1.5	Common
Ferns				
Lady Fern	<i>Athyrium filix-femina</i>	5.2	4.5	Sparse
Grass				
Dunegrass	<i>Elymus mollis</i>	5.0	3.7	Sparse
Reed Canarygrass	<i>Phalaris arundinacea</i>	5.2	3.7	Abundant
Horsetails				
Swamp Horsetail	<i>Equisetum fluviatile</i>	4.5	3.7	Sparse
Rush				
Arctic Rush	<i>Juncus arcticus</i>	3.8	2.7	Common
Sedge				
American Bulrush	<i>Scirpus americanus</i>	2.8	1.9	Few
Creeping Spikerush	<i>Eleocharis palustris</i>	2.0	1.7	Common
Lyngby's Sedge	<i>Carex lyngbyei</i>	2.8	1.7	Abundant
Soft-stemmed Bulrush	<i>Scirpus lacustris</i>	3.7	2.1	Sparse
Shrubs				
Black Hawthorn	<i>Crataegus douglasii</i>	5.2	5.2	Rare
Black Twinberry	<i>Lonicera involucrata</i>	5.2	4.5	Sparse
English Holly	<i>Ilex aquifolium</i>	5.2	4.5	Rare
Evergreen Blackberry	<i>Rubus laciniatus</i>	5.2	4.1	Sparse
Himalayan Blackberry	<i>Rubus discolor</i>	5.2	4.1	Few
Japanese Knotweed	<i>Polygonum cuspidatum</i>	5.2	4.1	Few
Nootka Rose	<i>Rosa nutkana</i>	5.2	4.1	Common
Red Elderberry	<i>Sambucus racemosa</i> ssp. <i>pubens</i>	5.2	5.2	Rare
Scotch Broom	<i>Cytisus scoparius</i>	5.9	4.5	Sparse
Sitka Mountain-Ash	<i>Sorbus sitchensis</i>	5.2	4.5	Rare
Snowberry	<i>Symphoricarpos albus</i>	5.2	4.5	Sparse
Trees				
Black Cottonwood	<i>Populus balsamifera</i> spp. <i>trichocarpa</i>	5.2	4.5	Few
Red Alder	<i>Alnus rubra</i>	5.2	4.5	Few
Scouler's Willow	<i>Salix scouleriana</i>	5.2	4.3	Few
Vine Maple	<i>Acer circinatum</i>	5.2	4.5	Sparse
Western Crabapple	<i>Pyrus lusca</i>	5.2	4.5	Sparse
Wildflowers				
American Vetch	<i>Viola americana</i>	5.2	3.8	Sparse
Beach Pea	<i>Lathyrus japonicus</i>	5.2	3.8	Sparse
Canada Goldenrod	<i>Solidago canadensis</i>	5.2	4.1	Few
Canada Thistle	<i>Cirsium arvense</i>	5.2	4.1	Sparse
Common Plantain	<i>Plantago major</i>	5.2	3.5	Sparse
Curled Dock	<i>Rumex crispus</i>	5.2	3.5	Sparse
Douglas' Aster	<i>Aster subspicatus</i>	5.2	3.2	Sparse
Field Mint	<i>Mentha arvensis</i>	5.2	3.5	Sparse
Hedge False Bindweed	<i>Calystegia sepium</i>	5.2	4.5	Rare

* Range elevations are measured in metres, Chart Datum

** Abundance is relative to availability of suitable habitat within the observed elevation range.

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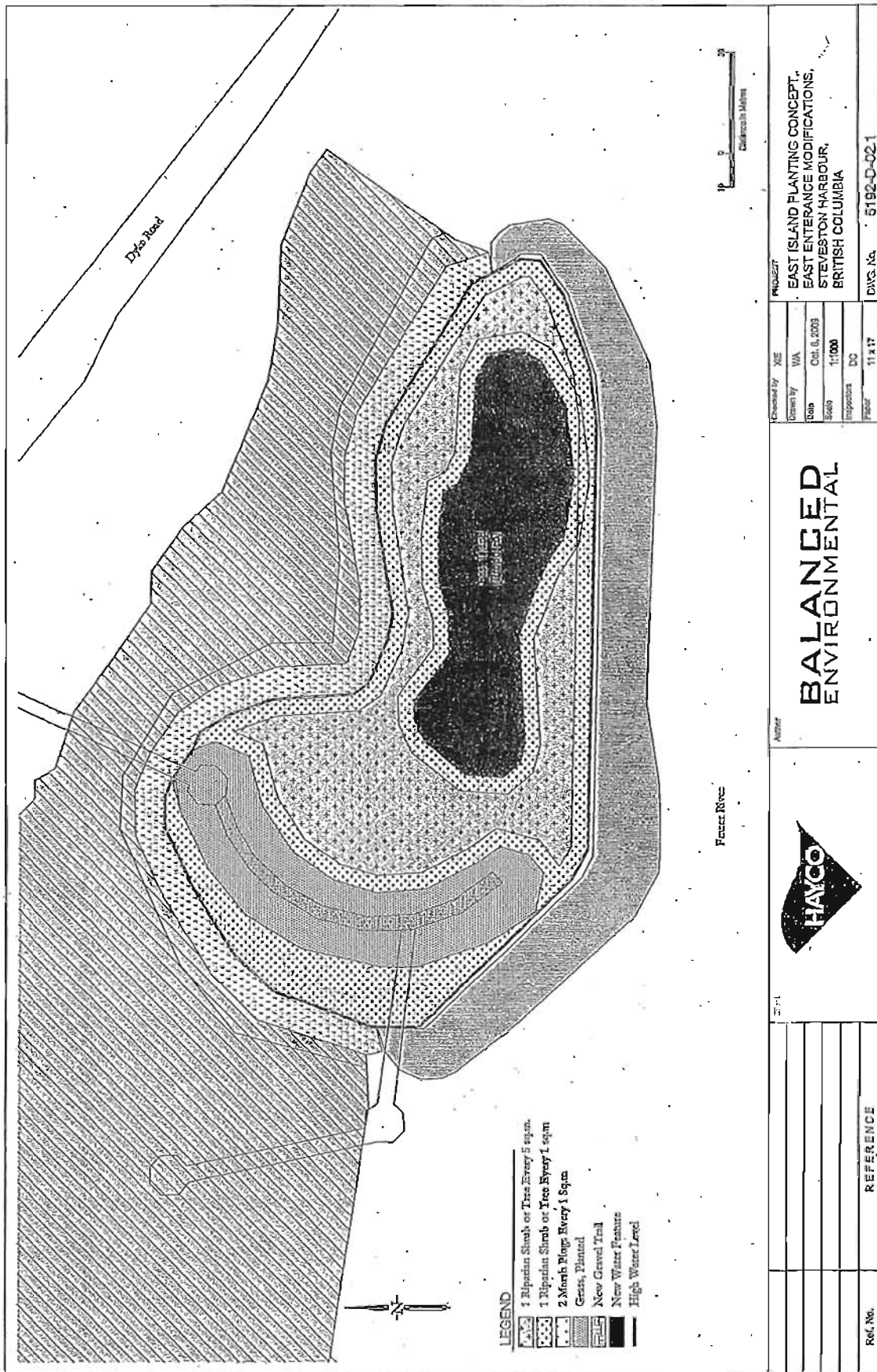
5182-E-02.2 EAST MARSH SPECIES LIST.XLS

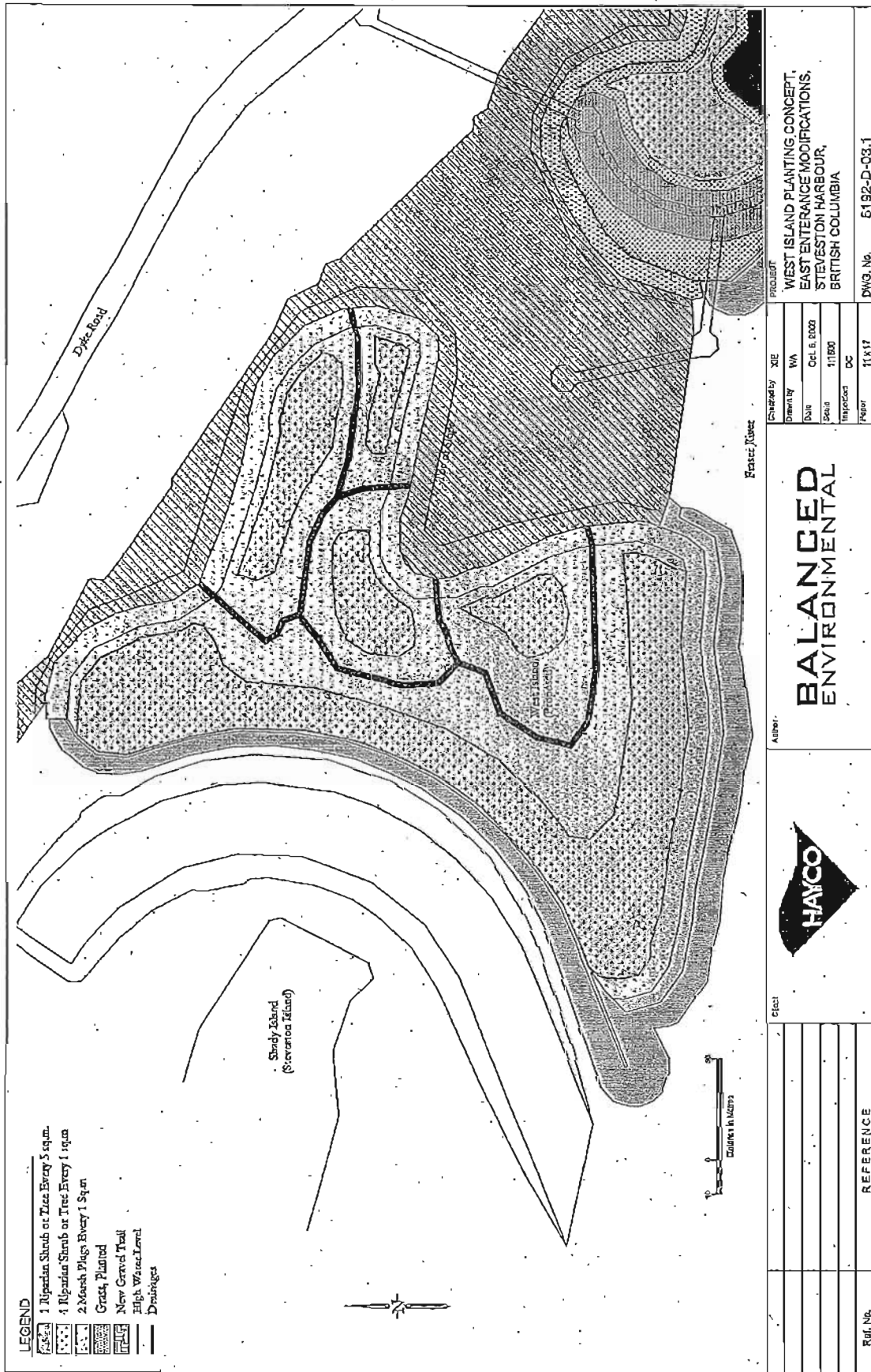
Pacific Silverweed	<i>Potentilla pacifica</i>	4.5	3.8	Few
Prickly Sow-thistle	<i>Sonchus asper</i>	5.2	4.1	Sparse
Purple Loosestrife	<i>Lythrum salicaria</i>	5.2	3.7	Few
Sea Arrowgrass	<i>Triglochin maritimum</i>	3.0	2.5	Few
Smartweed	<i>Polygonum sp.</i>	5.0	3.5	Few
Spearscale	<i>Atriplex patula</i>	4.5	3.8	Sparse
Springbank Clover	<i>Trifolium wormskjoldii</i>	5.2	3.5	Few
Water Parsnip	<i>Sium suave</i>	3.8	2.5	Sparse
Yellow Flag Iris	<i>Iris pseudocorus</i>	5.2	3.7	Few

**ABUNDANCE ESTIMATES		
Description	Aerial Coverage	Individual Counts
Rare	<5%	1
Sparse	5-25%	2-4
Few	26-50%	5-10
Common	51-75%	11-30
Abundant	>75%	>30

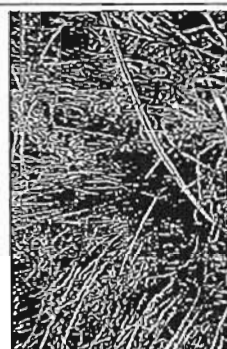
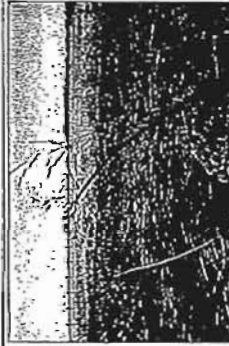
* Range elevations are measured in metres, Chart Datum

** Abundance is relative to availability of suitable habitat within the observed elevation range.









UNIVERSITY

High Water Level (4.5m Chert Datum)

Low Water Level (rim chart 0.5m)

—, Low Solar Level (LNL)

Die Blackberry
car Customized Black

Cat: 100
 Color: Black
 Country:

Grass

• **Pharmacokinetics** •
• **Subsiding** •

	29
cupus	29
pharmis	15

On Edge
Dixie - Stephens

Dis - Disculus
Beb - Bueh

Red Rush
End Green String Lefties

End Green String Lethal
Blooded Veneration

DRAWING NOTES

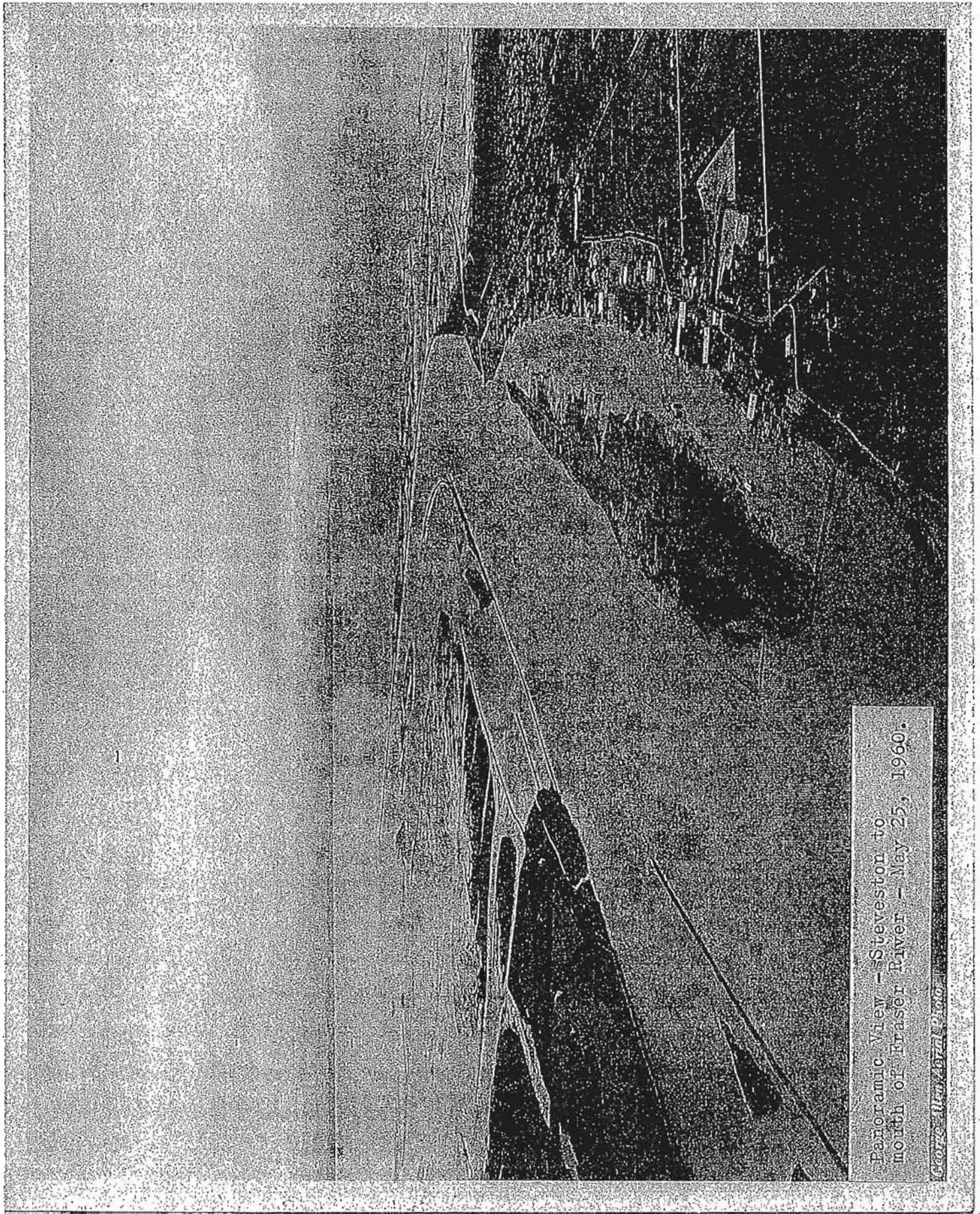
Site Visits Mar 4 and July 20, 2009

Elaboration on the metrics and the data sources used in the study.

Client	 <p>Fisheries and Oceans et Océans</p>	Address	<p>BALANCED ENVIRONMENTAL</p> <p>118 Gardia Avenue, North Vancouver, B.C., V7P 3K2</p>	Discussed by	XSE	Project	<p>BIOLOGICAL CONDITIONS, EAST ENTRANCE, STEVESTON HARBOUR, BRITISH COLUMBIA</p>
				Drawn by	WA		
				Date	July 21, 2009		
				Scale	1:5000		
				Project No.	WA00008		
				Page No.	11/17		DWG. No. 51-82-D-12.1

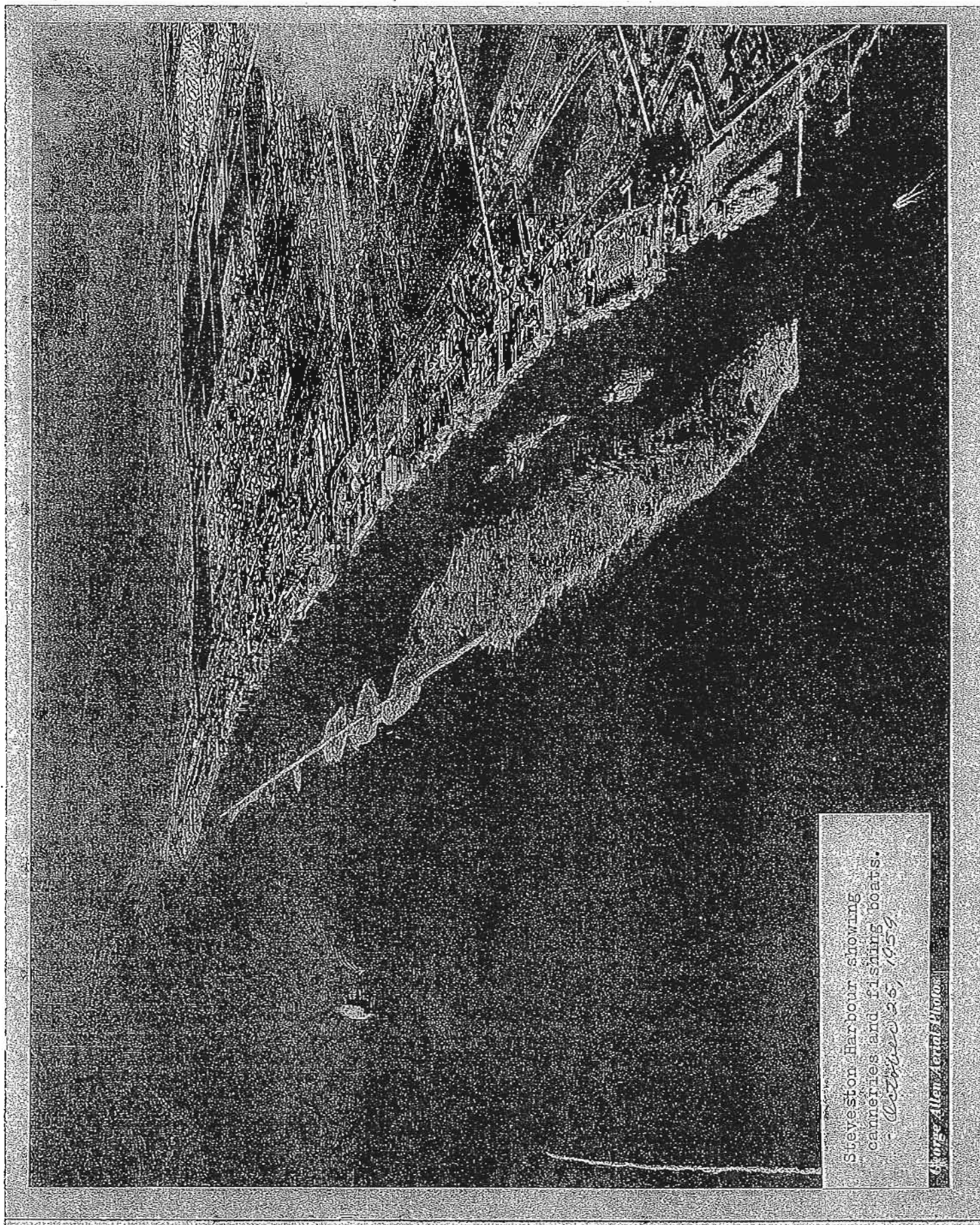
APPENDIX C
Steveston Harbour Authority
Dredging Funding Summary

YEAR	FUNDING RECEIVED
2002/2003	275,000.00
2003/2004	200,000.00
2004/2005	200,000.00
2005/2006	200,000.00
2006/2007	350,000.00
2007/2008	200,000.00
2008/2009	335,000.00
2009/2010	400,000.00
2010/2011	400,000.00
2011/2012	200,000.00



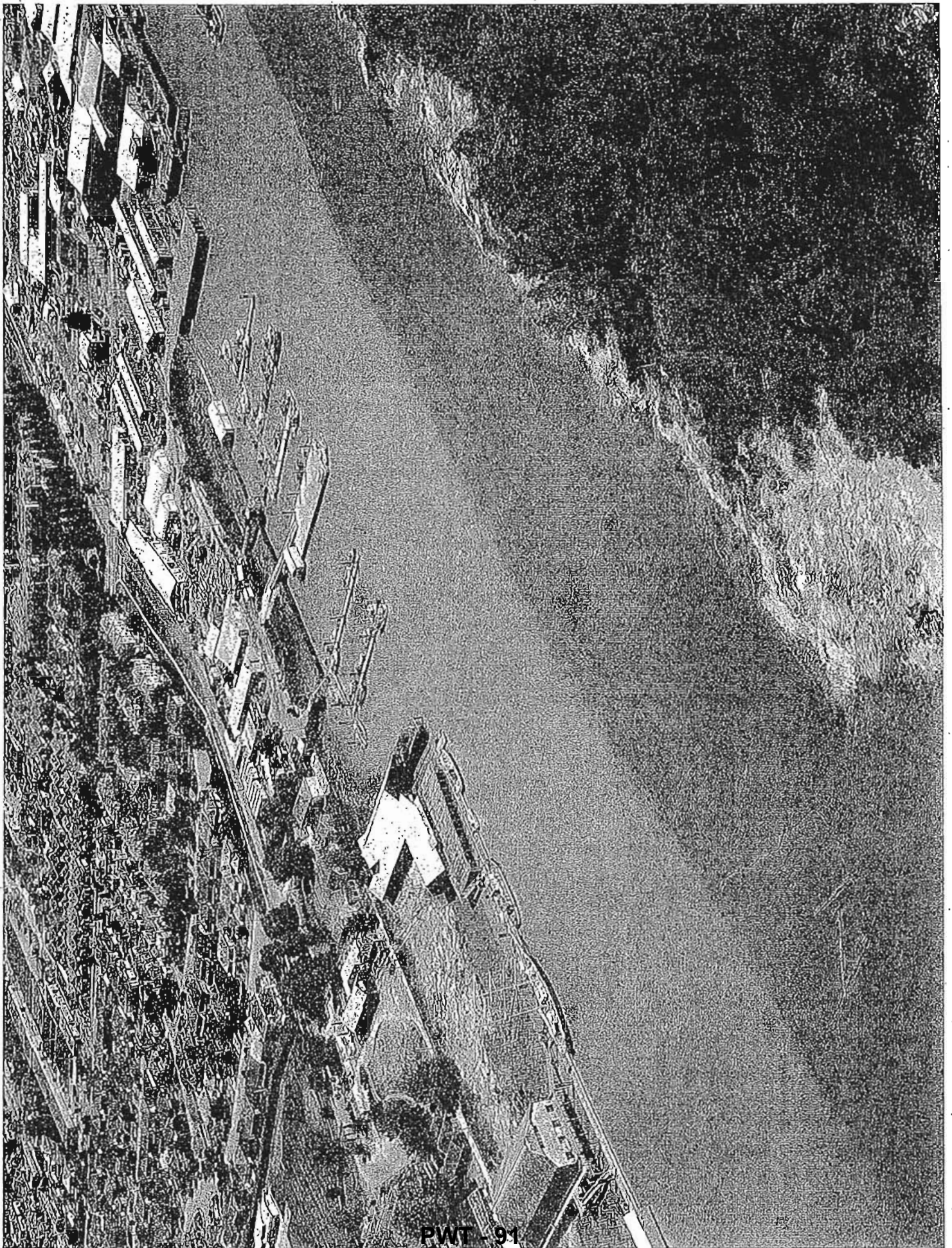
Panoramic View - Steveston to
mouth of Fraser River - May 25, 1960.

George Allen Photo



Steveston Harbour showing
canneries and fishing boats.
- October 25, 1959

George Allen Aerial Photo.



PWT - 91

APPENDIX B



PWT - 92



PORT METRO
vancouver

APPLICATION FORM
Local Channel Dredging Contribution Program – Advance of Funds

Society/Company Name:

Society/Company Number:

Contact Name:

Phone Number (s):

Mailing Address:

Email Address:

LIST OF APPLICABLE LOCAL CHANNELS

1.

2.

3.

4.

5.

INTENDED PURPOSE OF ADVANCE FUNDS

- ☐ Consulting
- ☐ Samples/ Tests
- ☐ Computer modeling
- ☐ Other. Please describe:

Estimate /Proposal Amount

Please provide copies of firm proposals for indicated services and/or backup for estimates

TOTAL REQUESTED AMOUNT

Application Date: _____

Name (please print): _____

Signature: _____

Please forward application to:
Port Metro Vancouver
Planning and Development Department
100 The Pointe, 999 Canada Place
Vancouver, BC Canada V6C 3T4

By signing and submitting this Application you agree to be bound by the above terms and conditions.



Local Channel Dredging Contribution Program

Application for Advance of Funds

Background

In 2008, the Vancouver Fraser Port Authority, doing business as Port Metro Vancouver ("PMV") finalized a Dredging Policy which included a 10-year **Local Channel Dredging Contribution Program** that will provide financial support for riverfront communities to undertake their own dredging activities beyond deep sea and domestic shipping channels.

This Application for Advance of Funds form is designed to enable designated riverfront communities to apply for advance funding to assist with preparing their formal application under this program.

Applicant Eligibility

Applications for Advance of Funds will only be accepted from designated riverfront communities which have registered with the B.C. Corporate Registry as a Society or B.C. Company.

Use of Funds

Funds advanced under this program can only be used for activities directly related to preparing a full application for funding i.e. third-party consulting, computer modelling, samples, tests etc. The funds cannot be used for dredging or administrative costs of the applicant. The maximum advance which may be approved is 10% of funding available per channel to a maximum of \$125,000 for multi-channel applicants.

Application Process

The Application for Advance of Funds will be reviewed by PMV within 4 to 6 weeks. Delays may result from incomplete Applications.

Advance for Funds Approval

- If the Application is approved, Applicants will receive written notification from PMV along with a cheque for the approved amount.
- PMV reserves the right to approve all, some or none of the requested amount.

Reporting Requirements:

- Applicants are required to make available to PMV, on request, copies of all reports, computer models, tests, samples etc. funded by the advance.
- PMV reserves the right to request the Applicant to provide a summary accounting of the use of funds. The summary must be signed by at least three Directors of the company/society.

Return of Funds

PMV reserves the right to request the Applicant to return any unused funds based on its review of Applicant's accounting summary.

Required Attachments:

1. **Certification of Incorporation under the British Columbia Corporate Registry:** a certificate of Incorporation given by the registrar for a Society or B.C. Company.
2. **A list of Directors:** a signed copy of the current list of directors on date of application.
3. **A signed resolution requesting funds:** a signed resolution from the company/society indicating its approval to request an advance of funds from Port Metro Vancouver under its Local Channel Dredging Contribution Program.
4. **Copies of third-party proposals and/or backup for estimates:** backup materials to support requested amounts for each category.