14 October 2013

To:   Roberts Bank Terminal 2 Project  
      Canadian Environmental Assessment Agency  
      410-701 West Georgia Street  
      Vancouver, BC V7Y 1C6  
      Telephone: 604-666-2431  
      Fax: 604-666-6990  
      RobertsBank@ceaa-acee.gc.ca

From:  Dr Marvin L. Rosenau  
       3349-Harvest Drive  
       Abbotsford, BC V3G 2Y6  
       Telephone: 778-928-2376  
       Marvin_Rosenau@bcit.ca

Re: Request by Canadian Environmental Assessment Act Public for Comments relating to the Roberts Bank Terminal 2 Project—Registry Reference Number 80054

Dear Sirs and Madames:

I am submitting this document as a comment in regards to the CEAA legislation, and to the Canadian Environmental Assessment Agency, in respect to the environmental impacts associated with the proposed Roberts Bank Terminal 2 Project and the Agency’s request for public input. The following, within this document, provides my comments.

I provide these opinions in respect to my professional background as an habitat biologist and scientist and I have attached my CV, below. Further to this, I was a member of the (now defunct) Fraser River Estuary’s (FREMP) Dredge Management Advisory Committee (DMAC) and, thus, have a level of specific background in the environmental issues within the Fraser estuary vis a vis shipping. I have also provided a cc list in respect to the agencies, groups, First Nations and individuals that are extremely interested in the future of what is left of the estuary and its vast fish and wildlife resources. And may be interested in this commentary and may be affected by the environmental impacts.
It is my opinion that the Roberts Bank Terminal 2 Project constitutes an extra-ordinarily brutal and destructive habitat impact to one of the world’s most important salmon and bird estuaries. This destruction, while including the impact of the actual footprint of ~167 ha, also includes the much-more profound effect of disrupting river and tidal flows and sediment deposition/erosion patterns, and movements of fishes (see attached diagramatic representation below). The project-description overview material provided by the proponent, embedded in the following web site (http://www.ceaa-acee.gc.ca/050/document-eng.cfm?document=94521), provides absolutely no confidence that the mitigation and compensation resulting from the expansion of Roberts Bank Terminal 2 will be adequate to resolve the impacts relating to the footprint, water and sediment movement and fish (i.e., juvenile salmon) migration. The largely scientifically incomplete and naïve statements in Metro Vancouver Port Authorities Project Description Documents embedded in the aforementioned web site is testament to these facts at hand. In short, the configuration of the Roberts Bank Terminal 2 comprises a “monster fish trap” with the resulting disruption of migratory fishes, freshwater plumes and other organisms (see figures below).

Most importantly, however, this project is the culmination of a whole series of large-scale incremental impacts to the estuary, most of which were “building blocks” to the functioning of the Port Metro Vancouver (and its predecessors such as the Fraser River Port Authority). Without many of these preceding projects, the Roberts Bank Terminal 2 Project could not be completed. None of these profound historical impacts have ever been mitigated particularly in respect to discharge patterns and sediment transport (the key to habitat maintenance and productivity in esturaries) and the disruption of fish migrations.

I urge the CEAA to consider the considerable impact to the Fraser River estuarine ecosystem as a result of the configuration and magnitude of this project, as well as the enormous incremental impacts (e.g., Roberts Bank Terminal 1) associated with previous works that have allowed this project to be put forward for construction. As proposed, this project should not be allowed to proceed. Clearly, alternatives to this design need to be explored as per CEAA legislation.

Accordingly CEAA must, as a minimum, establish a full and unbiased Public Review Panel to review this questionable project considering the countless past impacts to the estuary over the
past 150 years. A review must put the Project’s impacts into context with what has happened to the estuary over the past 150 years and make special note that the impacts of Roberts Bank Terminal 1 are still not largely understood and, where understood, have not been properly compensated for.

I look forwards to a response to this letter.

Sincerely,

Dr Marvin L. Rosenau

cc:  Minister of Fisheries and Oceans Canada  
Minister of Environment Canada  
Minister of Environment British Columbia  
Minister of Forest, Lands and Natural Resource Operations  
Port of Vancouver  
Port of Seattle  
Port of Portland  
Port of San Francisco  
Port of Los Angeles  
Port of San Diego  
Port of Tokyo  
Port of Shanghai  
Tsawwassen First Nations  
Musqueam First Nations  
Fraser River Watershed First Nations  
David Suzuki Foundation  
BC Wildlife Federation  
BC Federation of Drift Fishers  
Western Canada Wilderness Committee  
Fraser River Sturgeon Conservation Society  
Outdoor Recreation Council  
Vancouver Sun  
Vancouver Province  
Globe and Mail  
Richmond City Council  
Vancouver City Council  
Fraser Basin Council  
BCIT Rivers Institute
TRAINING WALLS AND CAUSEWAYS and the FRASER RIVER ESTUARY

IMPACTS TO SMALL SALMON AS A RESULT OF THE DEVELOPMENT OF TRAINING WALLS AND CAUSEWAYS IN THE FRASER RIVER ESTUARY

- the footprint, or the physical area, of the estuary that is no longer available for fish and other biological production
- the disruption of normal sediment erosion and deposition patterns
- the disruption of fish migration (i.e., feeding and osmoregulatory transition)
THE DEPOSITION OF SEDIMENTS IN THE FRASER ESTUARY

Is highly complex and clearly influenced by human intervention in flow via training walls and causeways; fish (e.g., rearing salmon fry) movement is almost certainly profoundly and negatively also affected although we do not have adequate research to tell us exactly how.

Figure from McLaren and Tuominen (1998)

LAKE WASHINGTON STUDY OF JUVENILE CHINOOK SHOWED THAT EVEN SMALL DOCKS AFFECT THE MIGRATION PATTERN OF THESE FISH EXPOSING THEM TO INCREASED VULNERABILITY TO PREDATION AND NEGATIVE EFFECTS TO ENERGETICS

Effect of structures:
- Increase distance traveled
- Force migrating smolts into deeper water (increase predation risk?)

Julie Hall, Seattle Public Utilities
julie.hall@seattle.gov
Microacoustic Tracking at Tennis Club
LAKE WASHINGTON STUDY OF JUVENILE CHINOOK SHOWED THAT EVEN SMALL DOCKS AFFECT THE MIGRATION PATTERN OF THESE FISH EXPOSING THEM TO INCREASED VULNERABILITY TO PREDATION AND NEGATIVE EFFECTS TO ENERGETICS

Docks affect how fish move along the shoreline

May-June

Fish continue to move along the shoreline, close to shore.

After passing under or around the dock, the school moves closer to shore.

As the school approaches a dock, the fish move offshore into deeper water and pass under or around the dock.

Fish move to schools close to shore (within a few meters).

Julie Hall powerpoint

ASSESSMENTS OF PUGET SOUND MARINE FISH-DISTRIBUTIONS SHOW THAT VARIOUS SPECIES ARE HIGHLY AFFECTED BY IN-WATER STRUCTURES THAT ARE CONSTRUCTED IN THE INTERTIDAL ZONES

Julie Hall, Seattle Public Utilities julie.hall@seattle.gov

Shoreline modifications that extend into the intertidal zone make a large difference in fish distribution.

The modifications truncate shallow water habitat and force fish into deep waters directly along shore.

Suulder Modifications


ASSESSMENTS OF PUGET SOUND MARINE FISH-DISTRIBUTIONS SHOW THAT VARIOUS SPECIES ARE HIGHLY AFFECTED BY IN-WATER STRUCTURES THAT ARE CONSTRUCTED IN THE INTERTIDAL ZONES

Julie Hall, Seattle Public Utilities julie.hall@seattle.gov

Presence of any shoreline modification affects types of prey available for fish.

Juvenile Chinook diets shows less terrestrial/riparian input (insects) at modified sites.

THE FOUR KEY SALMON SPECIES/STOCKS USING THE SHALLOW WATERS OF THE FRASER RIVER ESTUARY

Harrison River

sockeye fry

Harrison River

pink fry

Chinook fry

chum fry

Marine Planktonic/Nematic

Marine Benthic/Epibenthic

Plant Matter

Supratidal/Marsh

Terrestrial Riparian

Other
INTERUPTION OF MIGRATION PATHWAYS FOR FISH

In the 1970s and 1980s, large causeway developments interrupted the migration and feeding patterns of juvenile salmon as a result of a flawed designs.

NO PROPER FISH PASSAGE WAS EVER INCORPORATED INTO THESE DESIGNS

existing condition
what should have been incorporated into the construction design

MAIN ARM JETTY

NORTH ARM JETTY

BC FERRIES

IONA SEWERAGE PIPE
POSSIBLE EFFECTS OF CAUSEWAY AND TRAINING WALL DEVELOPMENT IN THE FRASER RIVER ESTUARY

A few years after the construction of these large causeways in the Fraser estuary, Harrison River Chinook stock collapsed and has never recovered.

![Graph showing the impact of large-scale causeway development on Chinook spawning escapements.]

Notes: 1. these Chinook rear as parrsater in the Fraser estuary before smolting
2. five year running average of data from mid-September onwards until end of test fishery.
Curriculum Vitae

Dr. MARVIN L. ROSENAU

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BC Institute of Technology
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Burnaby, British Columbia
CANADA V5G 3H2
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Cell: 778 928 2376
Fax: 604 432 9046
marvin_rosenau@bcit.ca

CAREER OBJECTIVE
To work in the field of fisheries/aquatic biology and environmental management, protection and science

EDUCATION

Doctor of Philosophy (science) University of Waikato, Hamilton, NEW ZEALAND 1992
Supervisor: Dr Anne Chapman

Master of Science (zoology) University of British Columbia, Vancouver, CANADA 1984
Supervisor: Dr J. D. McPhail

Bachelor of Science (honors) University of British Columbia, Vancouver, CANADA 1978
Supervisor: Dr J. D. McPhail

WORK HISTORY

Shuswap Lake Rainbow and Lake Trout Foreshore Habitat Assessment (FBC contract report) 2013-14

Shuswap Lake Juvenile Chinook Foreshore Habitat Assessment (FOC contract report) 2013

Shuswap Lake Juvenile and Adult Sockeye Foreshore Habitat Assessment (FOC contract report) 2011-12

Cohen Commission Missing Sockeye Inquiry Study Reviewer (habitat, stocks, disease; contract) 2010-11

Instructor Fisheries Ecology and Management RENR 3225, 4225
Environmental Monitoring RENR 3190
British Columbia Institute of Technology 2006-

Instructor (secondment) Fisheries Ecology and Management RENR 3225, 4225
Environmental Monitoring RENR 3190
British Columbia Institute of Technology 2005-2006
Visiting Scientist (secondment) 2003-04
UBC Fisheries Centre (Dr Daniel Pauly, Supervisor)

Fisheries Biologist – Sturgeon, Urban Fisheries, Endangered Fish Species, 1991-2006
Hydro-Electric Fisheries Impacts, River Sediment Management, Development Impacts on Floodplains,
Chair Habitat Conservation Fund Technical Ctte
BC Ministry Environment/Water, Land and Air Protection/
Environment, Lands, and Parks

Research and Reporting Habitat Issues Contracts for: 1998-09
Pacific Fisheries Resource Conservation Council

Principal and Senior Fisheries Biologist/Scientist 1990-91
Marvin L. Rosenau Consulting Company, British Columbia

Doctoral Student—Fisheries 1987-92
University of Waikato, Hamilton, New Zealand

Salmon Stock-Assessment Fisheries Technician 1986
Pacific Salmon Commission, British Columbia

Director and Sport-Fisheries Biologist (volunteer) 1984-87
Fraser Valley Salmon Society, British Columbia

Highway-Construction-Impacts Fisheries Biologist 1984-86
Andrew Consulting Limited, British Columbia

Railroad-Construction-Impacts Fisheries Biologist 1983-84
DB Lister and Associates, British Columbia

Salmonid Habitat-Research Fisheries Biologist/Technician 1982-83
BC Fish and Wildlife Branch, Ministry of Environment, British Columbia

Master’s Graduate Student—Zoology (fisheries) 1979-84
University of British Columbia, Vancouver, British Columbia

Biology of the Fishes Laboratory Instructor 1979-81
University of British Columbia, Vancouver, British Columbia

Hydro-Electric Dam Construction Impacts--Fisheries Technician 1978
University of British Columbia, Vancouver, British Columbia

Student Laboratory Technician 1977
University of British Columbia, Vancouver, British Columbia
SCIENTIFIC and RELATED AWARDS

**Roderick Haig-Brown Award Conservation Award**—in recognition of outstanding contributions in the field of conservation—Totem Flyfishers 2012

**Roland Michener Conservation Award**—for outstanding conservation achievement—Canadian Wildlife Federation 2010

**Ted Barsby Award** for outstanding contribution to conservation—BC Wildlife Federation 2009

**Murray A. Newman Award** for excellence in aquatic conservation—Vancouver Public Aquarium 1999

**American Fisheries Society**—“Best Paper Award” nomination—Transactions of the American Fisheries Society) 1988

**Hilary Jolly Memorial Scholarship**—University of Waikato DPhil Scholarship 1987

LEGAL EXPERT WITNESS

Min. Environment Lands and Parks v North 1999 gravel removal—MELP successfully defended appeal

BC Environmental Appeal Board hearing

Regina v Nguyen 2002 sturgeon poaching—conviction, jail term

Regina v Le 2004 sturgeon poaching—conviction, jail term

Regina v Douglas/Douglas/Quipp 2004 gravel removal HADD—no conviction

Regina v Goodman/Osadiuk/Bond 2005 sediment removal HADD—conviction

Quock, Dennis Jakesta, Doe, Doe, and persons unknown v Shell Canada Energy 2007 fish habitat Klappan River—defendants successful

Cassiar Watch v Regina and Shell Canada Energy 2009 fish habitat—

VOLUNTEER

Coquitlam River Watershed Roundtable—2012-present—member

Fraser Valley Salmon Society—1984-1986—director—2006-present—scientific and technical advice

Alouette River Management Society—1994-present—scientific and technical advice

Citizens Against Urban Sprawl Society (CAUSS)—2005-present—scientific and technical advice

Fraser River Sturgeon Conservation Society—1997 to 2003, 2006-present—director and scientific/technical advice
Save Our Rivers Society—2008-present—Board of Advisors—scientific and technical advice

BC Wildlife Federation—2009-present—scientific and technical advice (gravel removal, Northern Gateway Enbridge Douglas Channel oil shipping)

Fraser River Gravel Stewardship Committee—2007-present—scientific, technical and bureaucratic advice
THESES, PUBLICATIONS AND REPORTS

THESES


PRIMARY SCIENTIFIC JOURNALS


Rosenau, M.L., and M. Angelo. 2006. Low flows and increased temperatures are concerns for salmonid management of the Nicola River basin as the human demand for water increases and climate changes in south central British Columbia. Canadian Conference for Fisheries Research, January 5-7, 2006, Calgary, Alberta.


Rosenau, M.L., and E.D. Lane. 1994. Status of the white sturgeon, Acipenser transmontanus (Pisces:


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**PACIFIC FISHERIES RESOURCE CONSERVATION COUNCIL REPORTS**


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**TECHNICAL REPORTS and ARTICLES**


Lane, E.D., M.L. Rosenau, and six others. 1995. The conservation of sturgeon stocks in the Lower Fraser River watershed: a baseline investigation of habitat, distribution, and age and population of juvenile white sturgeon (*Acipenser transmontanus*) in the Lower Fraser River, downstream of Hope BC. Habitat Conservation Fund Project Final Report, Fisheries and Aquaculture, Malaspina College, Nanaimo, British Columbia, Canada. 96 pp. + appendices.


**MANUSCRIPT REPORTS**


