INVENTORY OF ENVIRONMENTALLY SENSITIVE GOODS BEING TRANSPORTED THROUGH THE FRASER RIVER ESTUARY.

ENVIRONMENT CANADA
EMERGENCIES DIVISION
PACIFIC YUKON REGION

INVENTORY OF ENVIRONMENTALLY SENSITIVE GOODS BEING TRANSPORTED THROUGH THE FRASER RIVER ESTUARY.

SOUTH FRASER PORT - NEW WESTMINSTER

NORTH FRASER PORT - RICHMOND

D. Chan
R. Gregory-Eaves

August 1994

This database and report has been created as a resource tool to evaluate the shipment of dangerous goods on the Fraser River; feasibility of the proposal for a CP Dangerous Goods Terminal at Tilbury Island

Location of the proposed CP Rail dangerous goods terminal adjacent to Rivtow

Memorandum

To: V. Niemela L. Nikl
C. Wykes B. Kelso
G. Colquoun F. Beech
D. Walton

cc. Ken Wile

From: David Chan and Rene Gregory-Eaves

Status of Environmentally Sensitive Goods Database
August 19, 1994

A meeting was held on Friday August 19 with Allen Domaas, Ken Wile, Jenni Stroh, David Chan and Rene Gregory-Eaves to discuss the status of this project. This also marked the completion of the compilation of Dangerous Goods permits of 1993 from the Fraser Port and North Fraser Harbour Commission. These permits were integrated into a pilot database. A summary of this work was generated in a status report "Inventory of Environmentally Sensitive Goods being transported through the Fraser River Estuary." and in an outline of the database utility.

The database will standardize and monitor the shipment of Dangerous Goods. This was revealed as a problem when compiling the permit applications of 1993. Keen interest was expressed by Allen Domaas as to the usefulness and completeness of design of the database. Movement towards implementing this database into the office of the Fraser Port and potentially all Ports in Greater Vancouver is underway. Allen Domaas will speak on the development of the database program at the Canadian Ports and Harbour Association Meeting in Hamilton next month which may generate some interest on a national level.

Steps that should follow this work are; an evaluation of toxicity of the Dangerous Goods identified in the compilation of 1993, an evaluation of toxicity of the Dangerous Goods shipped by CP Rail System, and finalisation of fields in the database. With the database completed, entries into the computer at port offices will flag hazardous combinations of toxicity, quantity and packaging of goods. This will alert the port office that a closer examination of this shipment should be taken. Any new chemicals that are not part of the inventory in the database will also be flagged. This will allow the port office to consult Environment Canada's staff as to the associated danger of the shipment.

INTRODUCTION

The Fraser River Estuary is a home for extensive aquatic and migratory avian wildlife that makes it particularly environmentally sensitive. Many migratory birds are dependent on the estuary as a nesting ground or refuge while in transport. The Fraser serves to be one of the world's largest remaining salmon producing rivers.

This report focuses on summarizing the first stage of a two stage evaluation on the CP proposal for a Dangerous Goods Berth at Tilbury Island. The purpose of this stage is to design and compile a database of environmentally sensitive goods (ESG) being transported in 1993 on the South and North arms of the Fraser River Estuary. Potential ESG's will be identified from the inventory and an evaluation will be made to determine the environmental toxicity of those goods in the second stage of the project. Upon completion of this project, a systems software will be provided to the ports for direct entry of the application forms into the computer. Identification of the ESG is intended to help determine the feasibility of a Canadian Pacific Railway (CP Rail) loading berth on Tilbury Island, Delta. Is the proposal for the CP Rail loading berth at Tilbury Island environmentally feasible?

The 1993 permit applications used in analysis were obtained from the Fraser Port (FP) and the North Fraser Harbour Commission (NFHC). The data entered from the application forms was limited to the information provided by the shipper. Each Port Commission had different application forms but the information was similar. Although the database intended for use is being designed, data was transcribed on to a spread sheet in Microsoft Excel.

Several complications were encountered during the transfer of the application forms to the database. An on sight evaluation of a shipping yard was also performed in order to clarify some information that pertained to the application forms and to oversee general shipping practices.

OBJECTIVES

The objectives of the project are as follows:

1. compiling an inventory of dangerous goods shipped on the Fraser and design a database for the project.

2. identifying the potential ESG's and evaluating environmental toxicity of these goods.

3. provide systems software for the Fraser Port and the North Fraser Harbour Commission.

INVENTORY OF DANGEROUS GOODS

This report focuses on the compilation of the data received from the two ports (FP and NFHC) and associated complications of the permit application forms. These complications are outlined below.

FRASER PORT

The Fraser Harbour Commission is located at suite 505-713 Columbia street, New Westminster, B.C. V3M 1B2. Carmen Germaine at (604) 524 6655 was our established contact at Fraser Harbour Commission.

From the application forms, the information that was transferred to the spread sheet included: name of applicant, intended date of movement, vessel, details of consignment, quantity, correct technical name, gross weight, U.N. number, IMCO class, remarks, last port of call, berth requested, next port of call, port and date. See figure 1. There were three revisions of the application form submitted to the Fraser Port in 1993. The newest format of the application form is more organized; however, a few modifications would resolve some of the inconsistencies found during the data entry process.

FRASER PORT

FRASER PORT: PLEASE RETURN
FAX TO: 946-9783

FRASER RIVER HARBOUR COMMISSION

APPLICATION FOR PERMIT TO MOVE DANGEROUS GOODS

836N

FIGURE 1

ATTENTION: PEGGY WILWAND - 524-1127

Name of Applicant RIVTOW FREIGHT

Intended Date of Movement July 29/94

Vessel GREAT WEST III

Details of consignments N/B TO KITIMAT

GOODS		Gross Wgt.	Net(Explosive) Content (kg)	U.N. No.	Stowage		Class IMCO	Additional Info. (Flash Point)	Name and Address of Inland Carrier
Quantity	Correct Technical Name	KGS			On Deck	Under Deck			
20 CYL'S	CARBON DIOXIDE	408		1013	✓		2.2		
4 PAILS	SODIUM HYDROXIDE, SOLID	104		1823	✓		8(9.2)		
6 CTNS	CORROSIVE LIQUID POISONOUS, N.O.S.	136		2922	✓		8(6.1)(9.2)		MARINE POLLUTANT
16 CTNS	AEROSOLS	34		1950	✓		2.1		MARINE POLLUTANT

Remarks

CC: DELTA FIRE DEPT., ATTN: CHIEF DENNIS MONK 946-0436
WESTMINSTER TUG, ATTN: MARG 522-7298

This vessel intends to, Load [X] Unload [ ] Retain on Board [ ] While in the harbour the above noted consignments.

Last Port of Call _____ Berth Requested TILBURY Next Port of Call _____

Port RIVTOW, TILBURY TERMINAL, DELTA Date July 28/94 Per _____ (Applicant)

Fr[redacted] ive[redacted] our[redacted] iss[redacted] 05 [redacted] Co[redacted] St[redacted] lew[redacted] min[redacted] .C. [redacted] 1B[redacted] 41 5[redacted] 355[redacted]

INCONSISTENCIES

Standardization should be made so that all weights and volumes entered are consistent with metric units (i.e., Kg. and Lb.). The standardization of units is important because it reduces the possibility for errors when converting units. In addition, it is time saving when doing analyses.

Grouping several ESG from the same shipment under one gross weight was not uncommon. This data would be insufficient in the case of a spill during transport. It would be very important to determine the environmental impact of such an accident for which more exact measurement for each ESG would be required. Having a unit of mass affixed to each good transported will help to alleviate the ambiguities for this problem.

Applications in some instances were being filed with the ports after the intended date of movement. This could be a problem if an ESG was spilled and the authorities were not even informed of the shipment.

In addition, xeroxed originals had to be obtained from Rivtow Freight for the Fraser Harbour Commission because the copies received from the Fraser Harbour Commission were not legible. The quantities of ESG field had been cut off as a result of the fax transmission. This observation suggests that the applications received were not thoroughly looked over before being filed away.

For a summary of goods being transported from these port in 1993 please see figure 2.

NORTH FRASER HARBOUR COMMISSION

The North Fraser Harbour Commission is located 220 Airport Road, Richmond, B.C. V7B 1C6. Reesa Stanfield was our established contact at the North Port and can be reached at (604) 273 1866.

SUMMARY OF GOODS TRANSPORTED THROUGH

FRASER PORT

Port	Chemical Names	TOTAL GROSS Wt. (kg)
FRASER SURREY DOCKS	PROPANE TANKS	91
FRASER SURREY DOCKS	ADHESIVES	238.5 + 0.6L
FRASER SURREY DOCKS	AEROSOL	4270.4
FRASER SURREY DOCKS	AEROSOL DISPENSERS	4021
FRASER SURREY DOCKS	AMMONIUM NITRATE	18000
FRASER SURREY DOCKS	BATTERIES	6131
FRASER SURREY DOCKS	BATTERY ACID	19
FRASER SURREY DOCKS	CALCIUM HYPOCHLORITE	162000
FRASER SURREY DOCKS	CALCIUM SILICIDE	102003.256
FRASER SURREY DOCKS	CARBON DIOXIDE	2
FRASER SURREY DOCKS	COATING SOLUTION	71014
FRASER SURREY DOCKS	CORROSIVE LIQUIDS	102
FRASER SURREY DOCKS	D'LIMONENE (WHITE WATER)	32.3
FRASER SURREY DOCKS	ETHANOL	28300
FRASER SURREY DOCKS	ETHNOLAMINE SOLUTIONS	617
FRASER SURREY DOCKS	HYDROCHLORIC ACID SOLUTION	3776
FRASER SURREY DOCKS	LIFE SAVING APPLIANCES	623
FRASER SURREY DOCKS	LUBRICATING GREASE	2510
FRASER SURREY DOCKS	N.O.S. BENOMYL	3159 +6.0L
FRASER SURREY DOCKS	NITROCELLULOSE SOLUTION	12
FRASER SURREY DOCKS	PAINT	397.9
FRASER SURREY DOCKS	PAINT ALKALINE	14515 + 8L
FRASER SURREY DOCKS	PAINT ENAMEL SPRAY	*N/A*
FRASER SURREY DOCKS	POTASSIUM AMYL XANTHATE	15000
FRASER SURREY DOCKS	PRILLED AMMONIUM NITRATE	724320

FIGURE 2

FRASER SURREY DOCKS	RESIN SOLUTION	134
FRASER SURREY DOCKS	SIGNAL DISTRESS	633
FRASER SURREY DOCKS	SIGNAL SMOKE	99
FRASER SURREY DOCKS	SODIUM CHLORATE	191000
FRASER SURREY DOCKS	SODIUM HYDROXIDE	428
FRASER SURREY DOCKS	SULPHURIC ACID	80L
FRASER SURREY DOCKS	TITANIUM SPONGE POWDER	8075
FRASER SURREY DOCKS	TT-17 PRIMER	20549
FRASER SURREY DOCKS	TT-27 PRIMER	546
FRASER SURREY DOCKS	TURPENTINE SUBSTITUTE	53
NEW WESTMINSTER, BC	BATTERY ACID	3000
NEW WESTMINSTER, BC	CALCIUM HYDRIDE	20
NEW WESTMINSTER, BC	CALCIUM HYPOCHLORITE	36000
NEW WESTMINSTER, BC	CALCIUM SILICIDE	106.378
NEW WESTMINSTER, BC	D'LIMONENE (DIPENTENTE)	17.28
NEW WESTMINSTER, BC	FERRO CALCIUM SILICON	19.976
PORT OF NEW WESTMINISTER	N.O.S.	1700
NEW WESTMINSTER, BC	PAINT	2500
RIVTOW, TILBURY TERMINAL, DELTA	ACETIC ACID	*46
RIVTOW, TILBURY TERMINAL, DELTA	ACETONE	40
RIVTOW, TILBURY TERMINAL, DELTA	ACETYLENE COMPRESSED	350
RIVTOW, TILBURY TERMINAL, DELTA	ADHESIVES	71
RIVTOW, TILBURY TERMINAL, DELTA	AEROSOL	8228.1
RIVTOW, TILBURY TERMINAL, DELTA	AEROSOL PAINT	272.3
RIVTOW, TILBURY TERMINAL, DELTA	AEROSOL PERMATEX	74
RIVTOW, TILBURY TERMINAL, DELTA	ALUMINUM SULPHATE	5906
RIVTOW, TILBURY TERMINAL, DELTA	AMEX	1250
RIVTOW, TILBURY TERMINAL, DELTA	AMMONIA ANHYDROUS LIQUEFIED	650
RIVTOW, TILBURY TERMINAL, DELTA	BATTERIES	53687 + 100L
RIVTOW, TILBURY TERMINAL, DELTA	BATTERY ACID	133 + 80L
RIVTOW, TILBURY TERMINAL, DELTA	BLEACH	1633
RIVTOW, TILBURY TERMINAL, DELTA	BROMOTRICHLOROMETHANE	45
RIVTOW, TILBURY TERMINAL, DELTA	CARBON DIOXIDE	11339
RIVTOW, TILBURY TERMINAL, DELTA	CARTRIDGES, SAFETY	465
RIVTOW, TILBURY TERMINAL, DELTA	CAUSTIC SODA FLAKE	991
RIVTOW, TILBURY TERMINAL, DELTA	CHLORINE	287154

FIGURE 2 cont..

RIVTOW, TILBURY TERMINAL, DELTA	CHLORODIFLUOROMETHANE	711.4
RIVTOW, TILBURY TERMINAL, DELTA	COMPRESSED GAS	1
RIVTOW, TILBURY TERMINAL, DELTA	DETONATORS	N/A
RIVTOW, TILBURY TERMINAL, DELTA	DICHLORODIFLUOROMETHANE	282
RIVTOW, TILBURY TERMINAL, DELTA	DIPHENYL METHANE	25.8
RIVTOW, TILBURY TERMINAL, DELTA	ENGINE STARTING FLUID	147
RIVTOW, TILBURY TERMINAL, DELTA	ETCHING ACID	159
RIVTOW, TILBURY TERMINAL, DELTA	ETHYL ALCOHOL SOLUTION	36
RIVTOW, TILBURY TERMINAL, DELTA	FIRE EXTINGUISHERS	396
RIVTOW, TILBURY TERMINAL, DELTA	FURFURYL ALCOHOL	1230
RIVTOW, TILBURY TERMINAL, DELTA	HAY	20907
RIVTOW, TILBURY TERMINAL, DELTA	HYDROCHLORIC ACID	88.5
RIVTOW, TILBURY TERMINAL, DELTA	HYDROCHLORIC ACID MIXTURE	345
RIVTOW, TILBURY TERMINAL, DELTA	HYDROCHLORIC ACID SOLUTION	27
RIVTOW, TILBURY TERMINAL, DELTA	HYDROGEN PEROXIDE - WASTE	363
RIVTOW, TILBURY TERMINAL, DELTA	HYPOCHLORITE SOLUTIONS	435
RIVTOW, TILBURY TERMINAL, DELTA	ISOPROPANOL	46
RIVTOW, TILBURY TERMINAL, DELTA	KEROSENE	1398 + 1591.1L
RIVTOW, TILBURY TERMINAL, DELTA	LAST CONTAINED CHLORINE RESIDUE	128502
RIVTOW, TILBURY TERMINAL, DELTA	LAST CONTAINED CHLOROETHANE RESIDUE	453
RIVTOW, TILBURY TERMINAL, DELTA	LAST CONTAINED COMPRESSED GAS & FLAMMABLE N.O.S.	118
RIVTOW, TILBURY TERMINAL, DELTA	LAST CONTAINED PROPANE RESIDUE	9 + 80 FT
RIVTOW, TILBURY TERMINAL, DELTA	LAST CONTAINED SODIUM HYDROXIDE OR CAUSTIC SODA	3600
RIVTOW, TILBURY TERMINAL, DELTA	LIFE RAFT	319
RIVTOW, TILBURY TERMINAL, DELTA	LIFE SAVING APPLIANCES	144
RIVTOW, TILBURY TERMINAL, DELTA	LITHIUM ALUMINUM HYDRIDE	549
RIVTOW, TILBURY TERMINAL, DELTA	METHANOL	281
RIVTOW, TILBURY TERMINAL, DELTA	METHYL CYANIDE ACETONITRILE	22.5
RIVTOW, TILBURY TERMINAL, DELTA	METHYL ETHYL KETONE	120.5
RIVTOW, TILBURY TERMINAL, DELTA	METHYL ETHYL KETONE PEROXIDE	22
RIVTOW, TILBURY TERMINAL, DELTA	METHYL ISOBUTYL KETONE	4.5
RIVTOW, TILBURY TERMINAL, DELTA	METHYL METHACRYLATE	1
RIVTOW, TILBURY TERMINAL, DELTA	MULTIPURPOSE OIL ; N/R	195
RIVTOW, TILBURY TERMINAL, DELTA	N.O.S. TETRAFLUROETHANE REFRIGERANT GAS	3044.3 + *37946 + 0.5L
RIVTOW, TILBURY TERMINAL, DELTA	NAPHTHA PETROLEUM MIXTURE	16
RIVTOW, TILBURY TERMINAL, DELTA	NITROCELLULOSE SOLUTION	227

FIGURE 2 cont..

RIVTOW, TILBURY TERMINAL, DELTA	NITROGEN	571
RIVTOW, TILBURY TERMINAL, DELTA	OXALIC ACID (OXALATES)	50
RIVTOW, TILBURY TERMINAL, DELTA	OXYGEN	1445
RIVTOW, TILBURY TERMINAL, DELTA	PAINT	8375.2
RIVTOW, TILBURY TERMINAL, DELTA	PAINT RELATED	4773
RIVTOW, TILBURY TERMINAL, DELTA	PAINT THINNER	65
RIVTOW, TILBURY TERMINAL, DELTA	PETROSOL SOLVENT	848
RIVTOW, TILBURY TERMINAL, DELTA	PHOSPHORIC ACID	65
RIVTOW, TILBURY TERMINAL, DELTA	PHOSPHORIC ACID SOLUTION	328
RIVTOW, TILBURY TERMINAL, DELTA	POLONIUM-210	0.5
RIVTOW, TILBURY TERMINAL, DELTA	POTASSIUM HYDROXIDE	585
RIVTOW, TILBURY TERMINAL, DELTA	POTASSIUM PERMANGANATE	2550
RIVTOW, TILBURY TERMINAL, DELTA	POWDER SMOKELESS	25
RIVTOW, TILBURY TERMINAL, DELTA	POWERFRAC	7500
RIVTOW, TILBURY TERMINAL, DELTA	PRIMERS, CAP TYPE	25
RIVTOW, TILBURY TERMINAL, DELTA	PROPANE	36
RIVTOW, TILBURY TERMINAL, DELTA	PROPANE TANK	36
RIVTOW, TILBURY TERMINAL, DELTA	QUINOLINE	79
RIVTOW, TILBURY TERMINAL, DELTA	RESIN SOLUTION	401
RIVTOW, TILBURY TERMINAL, DELTA	SIGNAL DISTRESS	7
RIVTOW, TILBURY TERMINAL, DELTA	SODIUM CARBONATE	35
RIVTOW, TILBURY TERMINAL, DELTA	SODIUM FLUORIDE	1
RIVTOW, TILBURY TERMINAL, DELTA	SODIUM FLUOROSILICATE	15500
RIVTOW, TILBURY TERMINAL, DELTA	SODIUM HYDROXIDE	1639
RIVTOW, TILBURY TERMINAL, DELTA	SODIUM HYDROXIDE SOLUTION	11248
RIVTOW, TILBURY TERMINAL, DELTA	SODIUM HYPOCHLORITE	3187
RIVTOW, TILBURY TERMINAL, DELTA	SODIUM HYPOCHLORITE SOLUTION	3428
RIVTOW, TILBURY TERMINAL, DELTA	SULPHURIC ACID	6 + *30
RIVTOW, TILBURY TERMINAL, DELTA	TANKS-CARBON DIOXIDE	431
RIVTOW, TILBURY TERMINAL, DELTA	TAR LIQUIDS	575
RIVTOW, TILBURY TERMINAL, DELTA	TOLUENE	21
RIVTOW, TILBURY TERMINAL, DELTA	TRICHLOROETHANE	4325
RIVTOW, TILBURY TERMINAL, DELTA	TRICHLOROETHYLENE	240
RIVTOW, TILBURY TERMINAL, DELTA	TRICHLOROMETHANE MIXTURE	18
RIVTOW, TILBURY TERMINAL, DELTA	TRICHLOROTHENE (IN DRUMS)	4082
RIVTOW, TILBURY TERMINAL, DELTA	WASTE BATTERIES	219165

FIGURE 2 cont..

RIVTOW, TILBURY TERMINAL, DELTA	WASTE CONTAMINATED w/ PENTACHLOROPHENOL	726
RIVTOW, TILBURY TERMINAL, DELTA	WASTE OIL	53877
RIVTOW, TILBURY TERMINAL, DELTA	XYLENE	1360
VANCOUVER, BC	ALCOHOLIC BEVERAGES	1798340
VANCOUVER, BC	CALCIUM HYPOCHLORITE	18000
VANCOUVER, BC	ETHANOL (ALCOHOL)	124624
	PROPANE TANKS	91
	GAS OIL TANKS(PURPLE DIESEL)	14400
	RESIN SOLUTION	2

FIGURE 2 cont..

The information that was transferred from the application to the spread sheet included the following: Permit number, applicant, vessel, berth request, transport date, class, U.N. number, quantity, description of goods, container dimensions, total explosive content, port and application date. See figure 3.

The only applications that were submitted to the North Fraser Harbour Commission were Class 1 explosives. The North Fraser Harbour Commission has been informed of this and is looking into the situation.

INCONSISTENCIES

The North Fraser also has grouped ESGs from the same shipment under the same gross weight.

For a summary of goods being transported from these port in 1993 please see figure 4.

CONCLUSION

Transport of regulated environmentally sensitive goods in any surroundings is dangerous. The general practices to monitor the transport of ESG's is in place but not enforced enough which has resulted in incompleteness in reporting. In the development of a risk assessment for the transport of dangerous goods, it would be useful to expand the permit application to have a chemical breakdown of the commercial ESG products. This would allow for reference to the related toxicity information. This could be achieved by taking chemical names off material safety data sheets and putting them into the database.

AREAS THAT REQUIRE FURTHER STUDY

With the completion of the summary of dangerous goods shipments in the FP and NFHC for 1993, a toxicity analysis is required to determine the number of ESG that impose a threat to the Fraser River Estuary. Also examination of the dangerous goods shipped by CP Rail System in Burrard

90 - 10

EXPLOSIVES PERMIT

NORTH FRASER HARBOUR COMMISSION

623

Permit No.

PERMIT TO MOVE EXPLOSIVES, DANGEROUS AND RADIOACTIVE GOODS

Subject to the regulations governing explosives and other dangerous goods, as embodied in the North Fraser Harbour Commission By-Laws 79-121, as well as to the special conditions set forth on the reverse side of this permit and imposed under various sections of such By-Laws, permission is granted as follows:

PART I

To: Arrow Transportation Systems

For Vessel: Barge: MLT 2 Tug: Mercury 12

To Berth at: Arrow Yard # 4

Date: July 7, 1993

To Load/Unload the following goods:

CLASS	DIVISION	QUANTITY & DESCRIPTION OF GOODS	TOTAL KG.
1.1D	UN # 0081	375 Cases Powerfrac 50 X 400	
1.1D	UN # 0081	50 Cases Giant Gelatin 25 X 200	
1.1D	UN # 0081	100 Cases Loggers Special 45 X 400	
1.1D	UN # 0081	50 Cases Loggers Special 45 X 200	14,375 Kg.
1.1D	UN # 0241	200 Cases Powermax 120 50 X 400 SWF	4,540 Kg.
		TOTAL	18,915 Kg.

IN ACCORDANCE WITH SCHEDULE "D" OF THE DANGEROUS GOODS SHIPPING REGULATIONS. ALL DETONATOR PRODUCTS MUST BE STORED SEPARATELY.

PART II

Being carrier(s) by railway or road of explosives or other dangerous goods:

a) To move by land (within the harbour boundaries, and including the unloading or loading of railway cars and/or other land vehicles) the goods contemplated by Part I above to or from the place authorized by Part I above for loading to or unloading from, the vessel, as the case may be.

b) (In case where Part I is not applicable) To move by land (within the harbour boundaries and including the unloading or loading of railway cars and/or other land vehicles) the following goods:

Quantity: _____

Description of Goods: _____

PART III

Remarks pertinent to Part I and/or Part II:

_____

_____

Port: North Fraser

Date: July 5, 1993

Harbour Master: _____

RECEIVED: _____ DATE: July 6/93

FIGURE 3

SUMMARY OF GOODS TRANSPORTED THROUGH
NORTH FRASER PORT

BERTH REQUESTED	*DESCRIPTION OF GOODS*	*TOTAL NET EXPLOSIVE CONTENT (Kg)*
ARROW YARD #4	1.5 LB BOOSTER	48
ARROW YARD #4	2 LB ROCK CRUNCHER	46
ARROW YARD #4	90 GRAM 2 HOLE	198
ARROW YARD #4	90 GRAM CAST BOOSTERS	*178677
ARROW YARD #4	A CHORD	270 + *178677
ARROW YARD #4	A CORD DETONATING CORD	4675
ARROW YARD #4	AMEX II	17300 + *90472
ARROW YARD #4	AMMONIUM NITRATE	2272720
ARROW YARD #4	AN PRILLS	1000
ARROW YARD #4	APCO GEL B1	42269 + *97006
ARROW YARD #4	APEX PLUS	10805 + *41425
ARROW YARD #4	B-LINE (+40CS CORDTEX 18)	N/A
ARROW YARD #4	BOOSTERS	7763.2 + *36118
ARROW YARD #4	CORD DETONATING	432
ARROW YARD #4	CORDTEX	10.2 + *4002
ARROW YARD #4	DETONINE	472.9
ARROW YARD #4	DETONING FLEXIBLE	521
ARROW YARD #4	DYNAMITE L	2500
ARROW YARD #4	DYNASHEAR	227 + *1334
ARROW YARD #4	ECONAMEX	17500 + *105679
ARROW YARD #4	ENUTRENCH	5692 + *402456
ARROW YARD #4	EXEI 7M P.1-8	0.7
ARROW YARD #4	EXPLOSIVES PLASTING TYPE A - PG11	4.54
ARROW YARD #4	EXTRA GELATIN	87332.5 + *69853

FIGURE 4

ARROW YARD #4	EZ DETS	N/A
ARROW YARD #4	FORCITE 75%	*1334
ARROW YARD #4	GELATIN EXPLOSIVES	681
ARROW YARD #4	GIANT GELATIN	*N/A*
ARROW YARD #4	HELIX 75	17388 + *32784
ARROW YARD #4	HYDROMITE 650	42432 + *357354
ARROW YARD #4	IMPACT X	89090
ARROW YARD #4	IREDYNE	12485 + *18059
ARROW YARD #4	IREDYNE SPECIAL GEL	30364
ARROW YARD #4	IREGEL	4404354
ARROW YARD #4	IREMITE	69916 + *18059
ARROW YARD #4	IRX 1000	9072
ARROW YARD #4	LITE LINE DETONATING CORD	5370 + *178677
ARROW YARD #4	LOGGERS SPECIAL	19348 + *14375
ARROW YARD #4	MAGNAFRAC R9205D	32275
ARROW YARD #4	NILITE WR	13500
ARROW YARD #4	NITROPAC	16800 + *19510
ARROW YARD #4	NITROPEL	*18059
ARROW YARD #4	ORANGE CAP BOOSTERS	*N/A*
ARROW YARD #4	POURVEX EXTRA	15617 + *31234
ARROW YARD #4	POWERFRAC	1000 + *26872
ARROW YARD #4	POWERMAX	8340 + *58349
ARROW YARD #4	PRILEX	*32820
ARROW YARD #4	ROCKCRUSHERS - BOOSTERS	321
ARROW YARD #4	RXL 718	*23145
ARROW YARD #4	UNIMAX	26899.5
COAST FERRY TERMINALS	AMEX II	9000
COAST FERRY TERMINALS	ECONAMEX	5000
COAST FERRY TERMINALS	EXTRA GELATIN	385.9
COAST FERRY TERMINALS	LOGGERS SPECIAL	2625
COAST FERRY TERMINALS	POWERFRAC	2800
COAST FERRY TERMINALS	POWERMAX	13680

FIGURE 4 cont..

Inlet needs to be considered. CP Rail has compiled a list of the top 15 most commonly moved regulated commodities through their Coal Harbour terminal (see Appendix B). Those commodities represent 80 percent of the total regulated traffic.

CASE STUDY: RIVTOW FREIGHT

The barge Captain Vernon being loaded for transport

APPENDIX A

CASE STUDY: *Rivtow Freight, Tilbury Island*

A half day visit was made to Rivtow Freight at Tilbury Island. The purpose of our visit was to clarify some annotations for containers, units of measure and general practices of the shipment of ESG found on the application forms. Several points of interest about the transport of the ESG were brought to our attention.

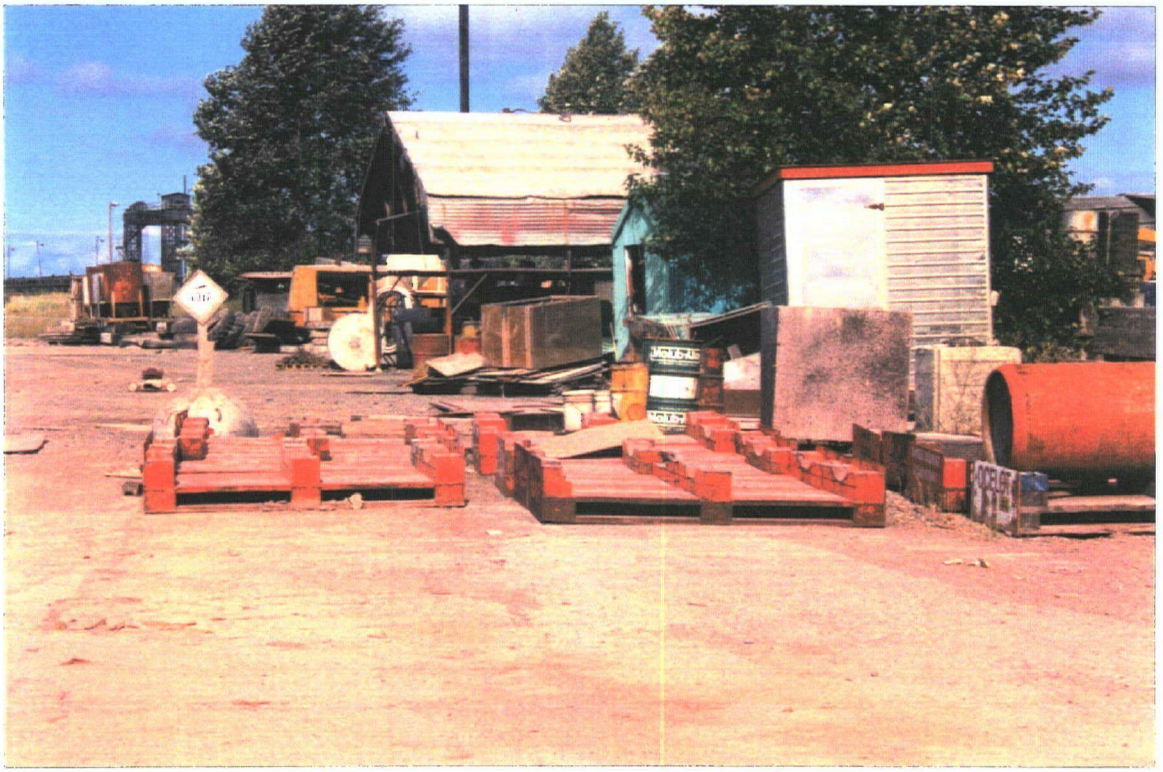
Rivtow voiced concerns that the smaller companies are less compliant with the regulations set forth in the Transport of Dangerous Goods Act. Often dangerous goods are packed or buried under non dangerous goods.

Rivtow draws up a map to indicate the location of the dangerous goods on the barge. Copies of the map are given to the captain of the tug boat. See figure 5. Rivtow are through in their documentation but does not have a listing of what is a marine pollutant and voiced concerns that a guide to marine pollutants was not available. Following up with Hugh McCash from Transport Canada, a guide is available: International Marine Dangerous Goods Code. However the responsibility to inform the shipper that the ESG is a marine pollutant is up to the consignor.

All Rivtow employees at the shipping yard are trained to handle and transport dangerous goods and possess a valid chlorine ticket. Transport of chlorine cylinders either empty or full requires an advance notification of 48 hours prior to receiving at the shipping yard. This procedure is followed as an added safety precaution. Due to the explosive and toxic nature of chlorine advance notification is given to the following organizations: local fire department, Port Commission, Coast guard and the tug boat company towing the barge. The local fire department is made aware of the location for the storage area. However, storage conditions for the chlorine tanks at the yard are inadequate for the prevention of any accidents. The tanks are held in cradles that have no containment. See figure 6. The potential for an accidental spill exists because the storage area for the tanks is not fenced off from the main traffic area of the yard.

FIGURE 5

Chlorine tanks saddled in cradles on Rivtow lot
Note: The road way on either side of tanks without any containment.



A closer shot of the tanks with U.N. numbers posted

Appendix B. The top 15 most commonly moved regulated commodities through the Coal Harbour Terminal.

AVERAGE QUANTITY PER HIGHWAY TRAILER LOAD FOR SELECTED REGULATED COMMODITIES

Commodity	Typical Packaging	Average Monthly Quantity (tonnes)	Average Monthly No. of Loads	Average Quantity Per Load (tonnes)
1. Propane	cylinders to highway tank trailers	1015	24	42.3
2. Sodium Chlorate	highway tank trailers	838	21	39.9
3. Liquid Oxygen	cylinders to highway tank trailers	632	16	39.5
4. Sulphuric Acid	large tanks on highway trailers	573	21	27.3
5. Corrosive Liquids	35 gallon barrels	548	53	10.4
6. Waste Petroleum Oil	35 gallon barrels, to highway tank trailers	499	14	35.6
7. Methanol	boxes/cartons to highway tank trailers	437	16	27.3
8. Hydrogen Peroxide	highway tank trailers	335	18	18.6
9. Liquid Ammonia	bottles/cartons shrink wrapped	260	12	21.7
10. Sodium Hydroxide	bottles, pails and drums	254	22	11.5
11. Ammonium Nitrates	highway tank trailers	200	7	28.6
12. Sulphur Dioxide	highway tank trailers	185	5	37.0
13. Paint	pails to highway tank trailers	175	60	2.9
14. Batteries	boxes on pallets	127	35	3.6
15. Molten Sulphur	highway tank trailers	82	2	41.0
Ethanol	highway tank trailers	52.8	2	26.4
Chlorine	cylinders in specially designed trailers	32	6	5.3

From: Reid Crowther & Partners, Supplementary Report to FREMP Application CP Rail System Proposed Tilbury Island Relocation. March 1994.

APPENDIX C

BERTHS IN THE F.P. FILING APPLICATIONS in 1993.

Rivtow Freight
Tilbury Terminals, Delta
Contact: Jim Dickson
7700 Hopcott Road, Delta
Ph: (604) 946 1206

Fraser Surrey Docks
11060 Elevator, Surrey B.C.
Ph: (604) 581 2233

New Westminster Docks
This facility does not exist any more.

BERTHS IN THE NFHC FILING APPLICATIONS in 1993.

Arrow Transportation Systems Inc.
Arrow Yard #4
11580 Mitchell Road, Richmond B.C.
Ph: (604) 324 1333

Coast Ferry
Coast Ferry Terminals
1400 E. Kent Avenue South
Ph: (604) 321 6833

For a map outlining the locations, please see figure 7.

LOCATION OF BERTHS TRANSPORTING DANGEROUS GOODS

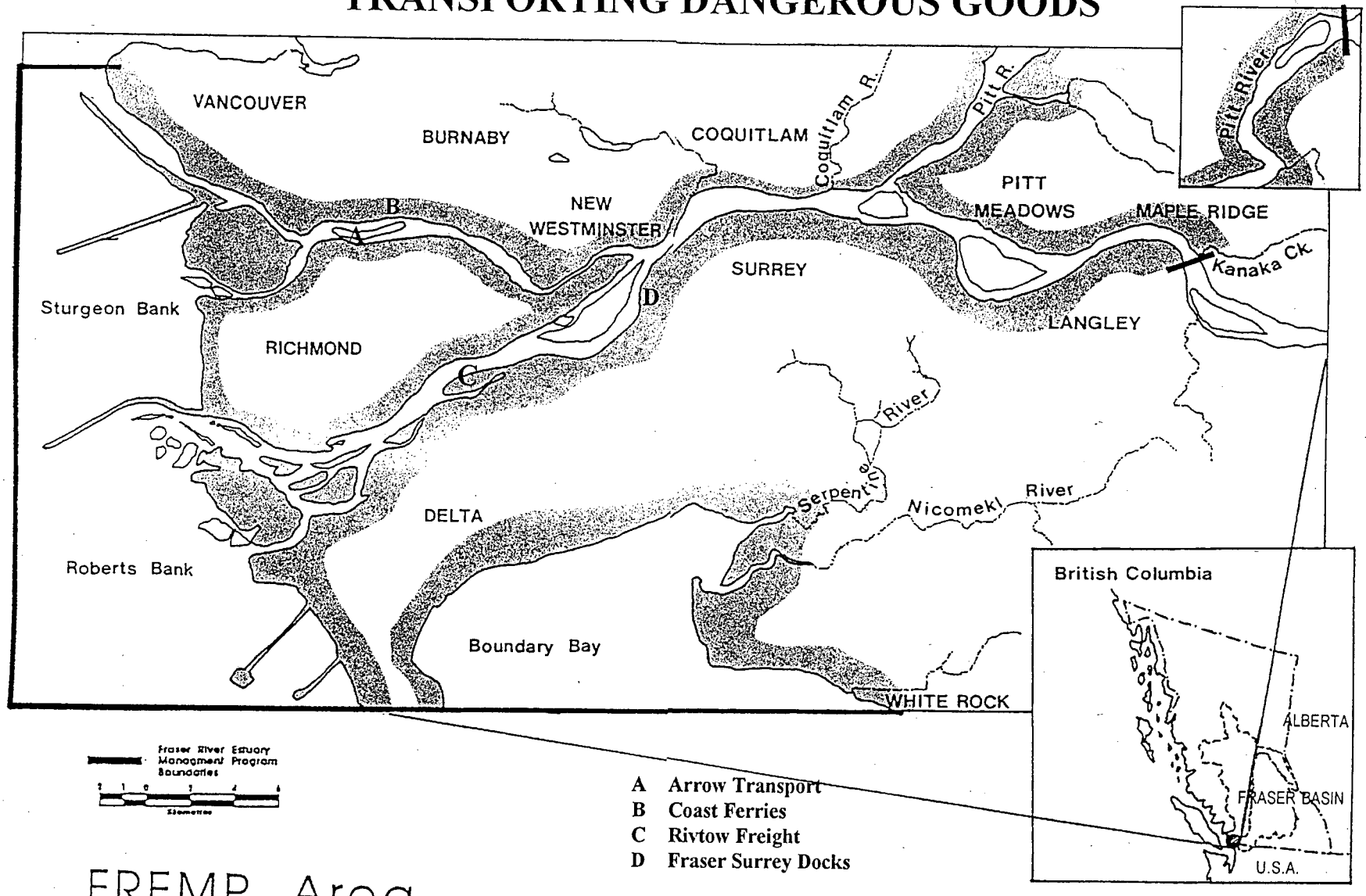


FIGURE 7

The FREMP boundaries encompass 155 square kilometeres of land and water on the wet side of the dykes of the Fraser River from Kanaka Creek and the outlet of Pitt Lake downstream to Georgia Strait including the outer banks from Point Grey to the U. S. Border including Boundary Bay.