
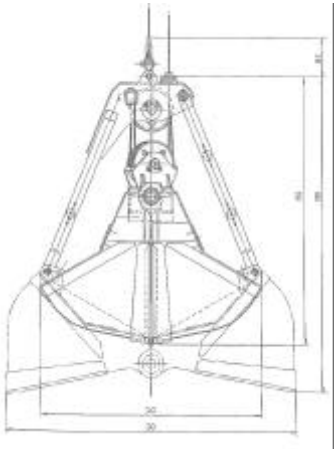



Appendix 36 Image of Handling Equipment

<p>(1) Quayside mobile crane 30tons at r=20m</p>	
<p>(2) Grab bucket 3cu.m (3.1mx1.75m)</p>	
<p>(3) Forklift 37 tons</p>	

(4) Forklift
3.5 tons



(5) Shovel loader



Appendix 38 Cost Breakdown of the Facilities

As supporting and/or complementary data and information for **Chapter 38**, the following tables are provided in this Appendix:

Table A38.2.1 Cost Breakdown of Channel Stabilization Facilities

Table A38.2.2 Cost Breakdown of Pier Structures in the Ports

Table A38.2.3 Cost Breakdown of Revetments in the Ports

Table A38.2.4 Cost Breakdown of Access Roads in the Ports

Table A38.4.1 Required Project Cost by Currencies in Each Year

Table A 38.2.1 Cost Breakdown of Channel Stabilization Facilities

(1) Groin

Groin 1

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	2,794	1.0			2,794
RC Pile Piling	40X40X1,860	Nos	1,071	1.0	0.0	1.0	1,071
Score Protection Mat		m2	25	17.5	0.1	19.3	483
Quarry Run		m3	12	25.8	0.2	31.0	372
Graded Rock	5-15cm	m3	15	14.1	0.2	16.9	254
Armor Rock	25-35cm	m3	30	15.8	0.2	19.0	570
Joint Beam	Concrete	m3	150	0.2	0.1	0.3	45

Groin 2

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	2,372	1.0			2,372
RC Pile Piling	40X40X1,790	Nos	1,048	1.0	0.0	1.0	1,048
Score Protection Mat		m2	25	16.3	0.1	17.9	448
Quarry Run		m3	12	8.9	0.2	10.7	128
Graded Rock	5-15cm	m3	15	9.9	0.2	11.9	179
Armor Rock	25-35cm	m3	30	14.6	0.2	17.5	525
Joint Beam	Concrete	m3	150	0.2	0.1	0.3	45

(2) Training Wall

Training Wall 1

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	3,000	1.0			3,000
Steel Sheet Piling	Type III-9.5m	Nos	588	2.5	0.0	2.5	1,470
Coping Concrete		m3	150	0.5	0.1	0.6	90
Geotextile Sheet		m2	5	26.0	0.1	28.6	143
Backfilling Rock		m3	13	7.1	0.2	8.5	111
Filling Sand		m3	3	12.8	0.2	15.4	46
Graded Rock	5-15cm	m3	15	11.0	0.2	13.2	198
Armor Rock	25-35cm	m3	30	17.0	0.2	20.4	612
Concrete Block / Mortar	50x50x15cm	Nos	10	0.0	0.1	0.0	0
Score Protection Mat		m2	25	12.0	0.1	13.2	330
Quarry Run		m3	12	0.0	0.2	0.0	0
Concrete		m3	11		0.1	0.0	0

Training Wall 2-1(1)

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	3,211	1.0			3,211
Steel Sheet Piling	Type III-9.5m	Nos	588	2.5	0.0	2.5	1,470
Coping Concrete		m3	150	0.5	0.1	0.6	90
Geotextile Sheet		m2	5	30.5	0.1	33.6	168
Backfilling Rock		m3	13	7.1	0.2	8.5	111
Filling Sand		m3	3	22.9	0.2	27.5	83
Graded Rock	5-15cm	m3	15	14.4	0.2	17.3	260
Armor Rock	25-35cm	m3	30	19.4	0.2	23.3	699
Concrete Block / Mortar	50x50x15cm	Nos	10	0.0	0.1	0.0	0
Score Protection Mat		m2	25	12.0	0.1	13.2	330
Quarry Run		m3	12	0.0	0.2	0.0	0
Concrete		m3	11	0.0	0.1	0.0	0

Training Wall 2-1(2)

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	1,435	1.0			1,435
Steel Sheet Piling	Type III-9.5m	Nos	588	0.0	0.0	0.0	0
Coping Concrete		m3	150	0.0	0.1	0.0	0
Geotextile Sheet		m2	5	20.0	0.1	22.0	110
Backfilling Rock		m3	13	0.0	0.2	0.0	0
Filling Sand		m3	3	10.0	0.2	12.0	36
Graded Rock	5-15cm	m3	15	14.4	0.2	17.3	260
Armor Rock	25-35cm	m3	30	19.4	0.2	23.3	699
Concrete Block / Mortar	50x50x15cm	Nos	10	0.0	0.1	0.0	0
Score Protection Mat		m2	25	12.0	0.1	13.2	330
Quarry Run		m3	12	0.0	0.2	0.0	0
Concrete		m3	11	0.0	0.1	0.0	0

Training Wall 2 = (3,211*3,500+1435*1,000)/4,500 =

2,816

Training Wall 2-2

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	4,016	1.0			4,016
Steel Sheet Piling	Type III-9.5m	Nos	588	2.5	0.0	2.5	1,470
Coping Concrete		m3	150	0.5	0.1	0.6	90
Geotextile Sheet		m2	5	33.1	0.1	36.4	182
Backfilling Rock		m3	13	7.4	0.2	8.9	116
Filling Sand		m3	3	78.0	0.2	93.6	281
Graded Rock	5-15cm	m3	15	19.2	0.2	23.0	345
Armor Rock	25-35cm	m3	30	23.9	0.2	28.7	861
Concrete Block / Mortar	50x50x15cm	Nos	10	0.0	0.1	0.0	0
Score Protection Mat		m2	25	12.0	0.1	13.2	330
Quarry Run		m3	12	23.7	0.2	28.4	341
Concrete		m3	11	0.0	0.1	0.0	0

(3) Bank Protection

Bank Protection 2 and 3

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	1,349	1.0			1,349
Steel Sheet Piling	Type III-9.5m	Nos	588	0.0	0.0	0.0	0
Coping Concrete		m3	150	0.0	0.1	0.0	0
Geotextile Sheet		m2	5	32.0	0.1	35.2	176
Backfilling Rock		m3	10	0.0	0.2	0.0	0
Filling Sand		m3	3	43.3	0.2	52.0	156
Graded Rock	5-15cm	m3	15	18.5	0.2	22.2	333
Armor Rock	25-35cm	m3	30	18.9	0.2	22.7	681
Concrete Block / Mortar	50x50x15cm	Nos	10	0.0	0.1	0.0	0
Score Protection Mat		m2	25	0.0	0.1	0.0	0
Quarry Run		m3	12	0.0	0.2	0.0	0
Concrete		m3	11	0.3	0.1	0.3	3

Bank Protection 5

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	1,992	1.0			1,992
Steel Sheet Piling	Type III-9.5m	Nos	588	1.3	0.0	1.3	764
Coping Concrete		m3	150	0.3	0.1	0.3	45
Geotextile Sheet		m2	5	2.0	0.1	2.2	11
Backfilling Rock		m3	10	8.0	0.2	9.6	96
Filling Sand		m3	3	11.9	0.2	14.3	43
Graded Rock	5-15cm	m3	15	6.0	0.2	7.2	108
Armor Rock	25-35cm	m3	30	9.6	0.2	11.5	345
Concrete Block / Mortar	50x50x15cm	Nos	10	22.0	0.1	24.2	242
Score Protection Mat		m2	25	12.0	0.1	13.2	330
Quarry Run		m3	12	0.0	0.2	0.0	0
Concrete		m3	11	0.6	0.1	0.7	8

Bank Protection 6

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	3,034	1.0			3,034
Steel Sheet Piling	Type III-9.5m	Nos	588	2.5	0.0	2.5	1,470
Coping Concrete		m3	150	0.5	0.1	0.6	90
Geotextile Sheet		m2	5	2.0	0.1	2.2	11
Backfilling Rock		m3	10	8.0	0.2	9.6	96
Filling Sand		m3	3	19.0	0.2	22.8	68
Graded Rock	5-15cm	m3	15	7.3	0.2	8.8	132
Armor Rock	25-35cm	m3	30	9.6	0.2	11.5	345
Concrete Block / Mortar	50x50x15cm	Nos	10	44.0	0.1	48.4	484
Score Protection Mat		m2	25	12.0	0.1	13.2	330
Quarry Run		m3	12	0.0	0.2	0.0	0
Concrete		m3	11	0.6	0.1	0.7	8

Bank Protection 7-1

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	3,082	1.0			3,082
Steel Sheet Piling	Type III-9.5m	Nos	588	2.5	0.0	2.5	1,470
Coping Concrete		m3	150	0.5	0.1	0.6	90
Geotextile Sheet		m2	5	2.0	0.1	2.2	11
Backfilling Rock		m3	10	8.0	0.2	9.6	96
Filling Sand		m3	3	15.5	0.2	18.6	56
Graded Rock	5-15cm	m3	15	6.5	0.2	7.8	117
Armor Rock	25-35cm	m3	30	6.0	0.2	7.2	216
Concrete Block / Mortar	50x50x15cm	Nos	10	62.0	0.1	68.2	682
Score Protection Mat		m2	25	12.0	0.1	13.2	330
Quarry Run		m3	12	0.0	0.2	0.0	0
Concrete		m3	11	1.2	0.1	1.3	14

Bank Protection 7-2

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	1,392	1.0			1,392
Steel Sheet Piling	Type III-9.5m	Nos	588	0.0	0.0	0.0	0
Coping Concrete		m3	150	0.0	0.1	0.0	0
Geotextile Sheet		m2	5	41.9	0.1	46.1	231
Backfilling Rock		m3	10	0.0	0.2	0.0	0
Filling Sand		m3	3	0.0	0.2	0.0	0
Graded Rock	5-15cm	m3	15	22.0	0.2	26.4	396
Armor Rock	25-35cm	m3	30	21.2	0.2	25.4	762
Concrete Block / Mortar	50x50x15cm	Nos	10	0.0	0.1	0.0	0
Score Protection Mat		m2	25	0.0	0.1	0.0	0
Quarry Run		m3	12	0.0	0.2	0.0	0
Concrete		m3	11	0.3	0.1	0.3	3

Table A 38.2.2 Cost Breakdown of Pier Structures in the Ports

(1) Hanoi Port

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	26,017	100.0			2,601,744
Steel Sheet Piling	Type IV-15.5m	Nos	1,109	250.0	0.0	250.0	277,250
Excavation		m3	5	315.0	0.0	315.0	1,440
Geotextile Sheet		m2	3	152.0	0.1	167.2	502
Backfilling Stone		m3	13	576.0	0.2	691.2	8,986
Filling Sand		m3	3	677.0	0.2	812.4	2,437
Asphalt	including base work	m2	25	1,500.0	0.1	1,650.0	41,250
Geotextile Sheet		m2	5	4,866.0	0.1	5,352.6	26,763
Graded Rock	5-15cm	m3	15	2,438.0	0.2	2,925.6	43,884
Armour Rock	25-35cm	m3	30	2,486.0	0.2	2,983.2	89,496
RC Pile Piling	400x400 L=40.0m, vertical	Nos	2,041	104.0	0.0	104.0	212,264
RC Pile Piling	400x400 L=35.4m, vertical	Nos	2,041	32.0	0.0	32.0	65,312
RC Pile Piling	400x400 L=31.3m, vertical	Nos	2,041	50.0	0.0	50.0	102,050
RC Pile Piling	400x400 L=40.2m, battered	Nos	2,265	48.0	0.0	48.0	108,720
SPP Pile Piling (Mooring Piles)	D=700 t=14mm L=39m	Nos	10,056	12.0	0.0	12.0	120,672
H Beam	500x500	t	2,597	38.7	0.0	38.7	100,519
Pontoon	118.5t x 2 Unit	Unit	382,660	2.0	0.0	2.0	765,320
Rubber Fender	H=25cm, L=100cm	Set	5,488	10.0	0.0	10.0	54,875
Reinforced Concrete	Lower Beams, Columns and Stairs	m3	201	800.6	0.1	880.7	177,021
Reinforced Concrete	Upper Beams and Slabs	m3	191	1,679.2	0.1	1,847.1	352,796
Capping Concrete	Steel Sheet Pile	m3	150	50.0	0.1	55.0	8,250
Lighting Pole		set	2,340	9.0	0.0	9.0	21,064
Fence		m	93	205.0	0.0	205.0	19,016
Handrail for stairs		m	37	50.0	0.0	50.0	1,857

Pier	1,018,163 / 100 =	10,182
Pontoon	1,041,386 / 2 =	520,693
Sheet Pile Wall	285,500 / 100 =	2,855
Back Filling	54,615 / 100 =	546
Slope Protection	160,143 / 100 =	1,601
Utility	41,937 / 1 =	41,937
Total	2,601,744	577,814

(2) Khuyen Luong Port

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	17,713	160.0			2,834,028
Steel Sheet Piling	Type IV-15.6m	Nos	1,109	400.0	0.0	400.0	443,600
Geotextile Sheet		m2	3	1,424.0	0.1	1,566.4	4,699
Backfilling Stone		m3	13	1,368.0	0.2	1,641.6	21,341
Filling Sand		m3	3	11,643.0	0.2	13,971.6	41,915
Dredging		m3	3	1,304.0	0.0	1,304.0	4,277
Geotextile Sheet		m2	5	3,537.0	0.1	3,890.7	19,454
Graded Rock	5-15cm	m3	15	2,111.0	0.2	2,533.2	37,998
Armour Rock	25-35cm	m3	30	2,177.0	0.2	2,612.4	78,372
Filling Sand		m3	5	9,552.0	0.2	11,462.4	57,312
RC Pile Piling	400x400 L=41.1m, vertical	Nos	2,090	72.0	0.0	72.0	150,480
RC Pile Piling	400x400 L=36.4m, vertical	Nos	2,090	36.0	0.0	36.0	75,240
RC Pile Piling	400x400 L=34.1m, vertical	Nos	2,090	36.0	0.0	36.0	75,240
RC Pile Piling	400x400 L=38.8m, battered	Nos	2,212	72.0	0.0	72.0	159,264
Rubber Fender	H=30cm, L=100cm	Set	6,585	144.0	0.0	144.0	948,246
Reinforced Concrete	Lower Beams and Columns	m3	201	1,000.0	0.1	1,100.0	221,100
Reinforced Concrete	Upper Beams and Slabs	m3	191	1,636.0	0.1	1,799.6	343,724
Reinforced Concrete	Fender Footing	m3	201	228.0	0.1	250.8	50,411
Capping Concrete	Steel Sheet Pile	m3	150	96.0	0.1	105.6	15,840
Mooring Bitt	25t	Nos	3,500	24.0	0.0	24.0	84,000
Curb	Concrete	m3	150	9.2	0.1	10.1	1,515

Pier	2,109,220 / 160 =	13,183
Pontoon	0 / 160 =	0
Sheet Pile Wall	459,440 / 160 =	2,872
Back Filling	67,955 / 160 =	425
Slope Protection	197,413 / 160 =	1,234
Utility	0 / 160 =	0
Total	2,834,028	17,713

(3) New North Port

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	17,077	280.0			4,781,583
Steel Sheet Piling	Type IV-15.3m	Nos	1,109	700.0	0.0	700.0	776,300
Geotextile Sheet		m2	3	2,330.0	0.1	2,563.0	7,689
Backfilling Stone		m3	13	2,154.0	0.2	2,584.8	33,602
Filling Sand		m3	3	6,110.0	0.2	7,332.0	21,996
Dredging		m3	3	6,392.0	0.0	6,392.0	20,966
Geotextile Sheet		m2	5	6,186.0	0.1	6,804.6	34,023
Graded Rock	5-15cm	m3	15	3,740.0	0.2	4,488.0	67,320
Armour Rock	25-35cm	m3	30	3,810.0	0.2	4,572.0	137,160
Filling Sand		m3	5	10,052.0	0.2	12,062.4	60,312
RC Pile Piling	400x400 L=34.3m, vertical	Nos	1,834	126.0	0.0	126.0	231,084
RC Pile Piling	400x400 L=29.6m, vertical	Nos	1,834	63.0	0.0	63.0	115,542
RC Pile Piling	400x400 L=27.3m, vertical	Nos	1,834	63.0	0.0	63.0	115,542
RC Pile Piling	400x400 L=32.0m, battered	Nos	1,957	126.0	0.0	126.0	246,582
Rubber Fender	H=30cm, L=100cm	Set	6,585	252.0	0.0	252.0	1,659,430
Reinforced Concrete	Lower Beams and Columns	m3	201	1,750.0	0.1	1,925.0	386,925
Reinforced Concrete	Upper Beams and Slabs	m3	191	2,863.0	0.1	3,149.3	601,516
Reinforced Concrete	Fender Footing	m3	201	399.0	0.1	438.9	88,219
Capping Concrete	Steel Sheet Pile	m3	150	168.0	0.1	184.8	27,720
Mooring Bitt	25t	Nos	3,500	42.0	0.0	42.0	147,000
Curb	Concrete	m3	150	16.1	0.1	17.7	2,655

Pier	3,594,495 / 280 =	12,837
Pontoon	0 / 280 =	0
Sheet Pile Wall	804,020 / 280 =	2,872
Back Filling	63,287 / 280 =	226
Slope Protection	319,781 / 280 =	1,142
Utility	0 / 280 =	0
Total	4,781,583	17,077

(4) New East Port

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	16,306	360.0			5,870,282
Steel Sheet Piling	Type IV-12.5m	Nos	920	900.0	0.0	900.0	828,000
Geotextile Sheet		m2	3	507.0	0.1	557.7	1,673
Backfilling Stone		m3	13	1,528.0	0.2	1,833.6	23,837
Filling Sand		m3	3	5,217.0	0.2	6,260.4	18,781
Dredging		m3	3	1,724.0	0.0	1,724.0	5,655
Geotextile Sheet		m2	5	7,200.0	0.1	7,920.0	39,600
Graded Rock	5-15cm	m3	15	4,914.0	0.2	5,896.8	88,452
Armour Rock	25-35cm	m3	30	4,965.0	0.2	5,958.0	178,740
Filling Sand		m3	5	2,978.0	0.2	3,573.6	17,868
RC Pile Piling	400x400 L=36.0m, vertical	Nos	1,917	162.0	0.0	162.0	310,554
RC Pile Piling	400x400 L=32.2m, vertical	Nos	1,917	81.0	0.0	81.0	155,277
RC Pile Piling	400x400 L=30.1m, vertical	Nos	1,917	81.0	0.0	81.0	155,277
RC Pile Piling	400x400 L=33.9m, battered	Nos	2,028	162.0	0.0	162.0	328,536
Rubber Fender	H=30cm, L=100cm	Set	6,585	324.0	0.0	324.0	2,133,553
Reinforced Concrete	Lower Beams and Columns	m3	201	2,178.0	0.1	2,395.8	481,556
Reinforced Concrete	Upper Beams and Slabs	m3	191	3,681.0	0.1	4,049.1	773,378
Reinforced Concrete	Fender Footing	m3	201	459.0	0.1	504.9	101,485
Capping Concrete	Steel Sheet Pile	m3	150	216.0	0.1	237.6	35,640
Mooring Bitt	25t	Nos	3,500	54.0	0.0	54.0	189,000
Curb	Concrete	m3	150	20.7	0.1	22.8	3,420

Pier	4,632,036 / 360 =	12,867
Pontoon	0 / 360 =	0
Sheet Pile Wall	863,640 / 360 =	2,399
Back Filling	44,291 / 360 =	123
Slope Protection	330,315 / 360 =	918
Utility	0 / 360 =	0
Total	5,870,282	16,306

Table A 38.2.3 Cost Breakdown of Rivetments in the Ports

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	151	1.0			151
Excavation		m3	5	0.6	0.0	0.6	3
Geotextile Sheet		m2	5	4.5	0.1	5.0	25
Graded Rock	5-15cm	m3	15	0.8	0.2	1.0	15
Armor Rock	25-35cm	m3	30	1.5	0.2	1.8	54
Filling Sand	CBR>5	m3	8	3.1	0.2	3.7	30
Curb	Concrete	m3	80	0.3	0.1	0.3	24

Table A 38.2.4 Cost Breakdown of Access Roads

2 Lanes

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	642	1.0			642
Excavation		m3	5	1.2	0.0	1.2	6
Graded Rock	5-15cm	m3	15	1.6	0.2	1.9	29
Armor Rock	25-35cm	m3	30	3.0	0.2	3.6	108
Filling Sand	CBR>5	m3	8	21.5	0.2	25.8	206
Asphalt Paving / main	incl. Base	m2	25	7.0	0.1	7.7	193
Asphalt Paving / side	incl. Base	m2	15	3.0	0.1	3.3	50
Lighting Pole	2 nos / 100m	Nos	2,400	0.02	0.0	0.02	48
Lighting Pole Base	2 nos / 100m	Nos	135	0.02	0.0	0.02	3

3 Lanes

Item	Type	Unit	Unit Cost	Qty	Extra	Handle Qty	Cost (USD)
		m	797	1.0			797
Excavation		m3	5	1.2	0.0	1.2	6
Graded Rock	5-15cm	m3	15	1.6	0.2	1.9	29
Armor Rock	25-35cm	m3	30	3.0	0.2	3.6	108
Filling Sand	CBR>5	m3	8	27.5	0.2	33.0	264
Asphalt Paving / main	incl. Base	m2	25	10.5	0.1	11.6	290
Asphalt Paving / side	incl. Base	m2	15	3.0	0.1	3.3	50
Lighting Pole	2 nos / 100m	Nos	2,400	0.02	0.0	0.02	48
Lighting Pole Base	2 nos / 100m	Nos	135	0.02	0.0	0.02	3

Table A38.4.1 Required Project Cost by Currency in Each Year

Unit: Local-Mill, VND, Foreign-Thou. USD

Description	Quantity	Unit Cost (USD)	2004		2005		2006		2007		2008		2009		TOTAL		
			Quantity	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign		
			Quantity	Local	Foreign	Quantity	Local	Foreign	Quantity	Local	Foreign	Quantity	Local	Foreign	Quantity	Local	Foreign
1 Channel Stabilization																	
1) Groin - 1	1,500 m	2,878	62	38	475	12,714	820	20,074	73,600	301					1,500	413,777	
2) Training Wall - 1	600 m	2,443	61	39	100	2,235	6,706	300	4,471	191					600	1,460	
3) Bank Protection - 1	4,500 m	3,390	38	62	1,500	28,955	3,153	1,500	28,955	3,153	28,955	3,153	1,300	25,120	4,300	83,089	
4) Management Information System	1 set	2,703,000	2	98											1,000	108,000	
5) Groin - 2	1,000 m	3,200	50	50											1,000	29,949	
6) Training Wall - 2	4,500 m	4,436	45	55											1,000	29,949	
7) Bank Protection - 2	800 m	1,539	63	37											800	11,635	
8) Management Information System	1 set	2,703,000	2	98											1,000	108,000	
9) Bank Protection - 3	500 m	1,539	63	37											500	7,272	
10) Management Information System	1 set	2,703,000	2	98											1,000	108,000	
11) Bank Protection - 4	1,000 m	2,202	35	65											500	7,272	
12) Management Information System	1 set	2,703,000	2	98											1,000	108,000	
13) Bank Protection - 5	4,500 m	3,275	37	63											1,000	29,949	
14) Management Information System	1 set	45,000	10	90											1,500	24,524	
15) Bank Protection - 6	1,500 m	3,324	36	64											1,500	24,524	
16) Management Information System	1 set	45,000	10	90											1,500	24,524	
2 Hanoi Port																	
1) Passenger Terminal	100 m	25,600	33	67											100	12,672	
2) Passenger Berth	1 set	41,937	33	67											1	208	
3) Utilities	1,000 m ²	120	33	67											1,000.0	594	
4) Cargo Terminal	800 m	1,392	62	38											800.0	10,356	
5) Bank Protection - 7 - 1	2.6 ha	250,000	40	60											2.6	3,900	
6) Road Elevation Improvement	1 set	2,703,000	2	98											1.0	811	
7) Equipment Procurement	1 set	45,000	10	90											1.0	2,649	
8) Management Information System	1 set	45,000	10	90											1	68	
9) Cargo Terminal	160 m	17,713	32	68											160	35,212	
10) Cargo Berth	400 m	151	32	68											400	13,604	
11) Revetment	63,000 m ³	2	32	68											63,000	605	
12) Land Reclamation	1 set	82,400	50	50											1	620	
13) Utilities	1.5 ha	250,000	50	50											1.5	2,813	
14) Warehouse	0.43 ha	1,200,000	50	50											0.43	3,870	
15) Terminal Pavement	2.2 ha	150,000	50	50											2.2	2,425	
16) Equipment Procurement	1 set	3,297,000	2	98											1	989	
17) Access Road	1,900 m	642	54	46											900	4,650	
18) Management Information System	1 set	45,000	10	90											1	68	
19) Cargo Terminal	280 m	17,075	31	69											200	15,880	
20) Cargo Berth	300 m	151	31	69											300	211	
21) Revetment	96,600 m ³	2	31	69											96,600	898	
22) Land Reclamation	1 set	72,200	50	50											1	542	
23) Utilities	1.5 ha	250,000	50	50											1.5	2,813	
24) Warehouse	0.21 ha	1,200,000	50	50											0.21	1,890	
25) Terminal Pavement	1.9 ha	150,000	50	50											1.9	2,138	
26) Equipment Procurement	1 set	2,956,000	2	98											1	887	
27) Access Road	2,300 m	642	54	46											1,300	6,740	
28) Dredging	160,000 m ³	2	20	80											160,000	960	
29) Management Information System	1 set	45,000	10	90											1	68	
30) Cargo Terminal	360 m	16,306	31	69											200	15,880	
31) Cargo Berth	700 m	151	31	69											700	12,132	
32) Revetment	341,000 m ³	2	31	69											341,000	898	
33) Land Reclamation	1 set	151,200	50	50											1	1,134	
34) Utilities	0.7 ha	250,000	50	50											0.7	1,313	
35) Warehouse	1.06 ha	1,200,000	50	50											1.06	9,540	
36) Distribution Center / CR	3.20 ha	1,300,000	50	50											3.20	31,200	
37) Terminal Pavement	2.6 ha	150,000	50	50											2.6	2,925	
38) Equipment Procurement	1 set	5,278,000	2	98											1	1,583	
39) Access Road	1,400.0 m	697	54	46											700	3,952	
40) Management Information System	1 set	45,000	10	90											1	68	
41) Passenger Berth	80.0 m	10,000	30	70											60	2,700	
42) Navigation Channel	##### m ³	2	20	80											800,000	4,800	
43) Capital Dredging	1 set	976,000	10	90											1	1,464	
44) Main Navigation Aids	1 set	770,000	10	90											1	1,155	
45) Management Equipment	1 set	1,064,000	10	90											1	1,596	
46) Information Service System	1 set	1,064,000	10	90											1	1,596	
47) Contingency	1 set		34	66												24,421	
48) Engineering Service	1 set	8,392,000	20	80												16,758	
49) Survey and Analysis	1 set	1,500,000	20	80												0.1	2,518
50) VAT	1 set		238	64												9,468	
51) TOTAL			5,006	1,335												284,702	
52) Foreign																44,630	
53) Local																239,272	

Appendix 39 Environmental Impact Assessment (EIA) and Social Consideration

A39.1 Environmental Survey and Measurements Data in the Project Areas (FLOODING SEASON)

Table A39.1.1 Sites for Monitoring of Sediment Material Quality

Sample symbol	Sampling site	Coordinate		Number of samples
		N	E	
S2-1.1	New North Port	21°N05285	105°E 49107	1 place x 1 point
S2-1.2		21°N49353	105°E 49353	1 place x 1 point
S2-2.1	Van Dong Site	21°N01886	105°E 51756	1 place x 1 point
S2-2.2		21°N01980	105°E 52052	1 place x 1 point
S2-3.1	Hanoi Port	21°N00950	105°E52247	1 place x 1 point
S2-3.2		21°N01295	105°E 52315	1 place x 1 point
S2-4.1	Bat Trang Site	20°N58446	105°E 54145	1 place x 1 point
S2-4.2		20°N58506	105°E 54531	1 place x 1 point
S2-5.1	Khuyen Luong Port	20°N57120	105°E 53325	1 place x 1 point
S2-5.2		20°N57174	105°E 53646	1 place x 1 point
S2-6.1	New East Port	20°N57074	105°E 53646	1 place x 1 point
S2-6.2		20°N57000	105°E 53540	1 place x 1 point

Source) ENTEC, August, 2002

Table A39.1.2 Sites for Water Sampling and In Situ Measurement

Sample symbol	Sampling site	Coordinate		Number of samples
		N	E	
W2-1.1	New North Port	21°N05285	105°E49107	1 place x 1 point x3 depths
W2-1.2		21°N05935	105°E49353	1 place x 1 point x3 depths
W2-2.1	Van Dong Site	21°N01886	105°E51756	1 place x 1 point x3 depths
W2-2.2		21°N01980	105°E52052	1 place x 1 point x3 depths
W2-3.1	Hanoi Port	21°N00950	105°E52247	1 place x 1 point x3 depths
W2-3.2		21°N01295	105°E52315	1 place x 1 point x3 depths
W2-4.1	Bat Trang Site	20°N58446	105°E54145	1 place x 1 point x3 depths
W2-4.2		20°N58506	105°E54531	1 place x 1 point x3 depths
W2-5.1	Khuyen Luong Port	20°N57120	105°E53325	1 place x 1 point x3 depths
W2-5.2		20°N57174	105°E53646	1 place x 1 point x3 depths
W2-6.1	New East Port	20°N57074	105°E53646	1 place x 1 point x3 depths
W2-6.2		20°N57000	105°E53540	1 place x 1 point x3 depths

Source) ENTEC, August, 2002

Table A39.1.3 Sites for Monitoring of Benthos in Riverbed

Sample symbol	Sampling site	Coordinate		Number of samples
B2-1.1	New North Port	21°N05285	105°E49107	1 place x 1 point
B2-1.2		21°N05935	105°E49353	1 place x 1 point
B2-2.1	Van Dong Site	21°N01886	105°E51756	1 place x 1 point
B2-2.2		21°N01980	105°E52052	1 place x 1 point
B2-3.1	Hanoi Port	21°N00950	105°E52247	1 place x 1 point
B2-3.2		21°N01295	105°E52315	1 place x 1 point
B2-4.1	Bat Trang Site	20°N58446	105°E54145	1 place x 1 point
B2-4.2		20°N58506	105°E54531	1 place x 1 point
B2-5.1	Khuyen Luong Port	20°N57120	105°E53325	1 place x 1 point
B2-5.2		20°N57174	105°E53646	1 place x 1 point
B2-6.1	New East Port	20°N57074	105°E53646	1 place x 1 point
B2-6.2		20°N57000	105°E53540	1 place x 1 point

Source) ENTEC, August, 2002

Table A39.1.4 Sites for Air Sampling

Sample symbol	Sampling site	Coordinate		Number of samples
A2-1	New North Port	21°N06238	105°E49359	1 point x3 times x 1 day
A2-2	Van Dong Site	21°N01805	105°E51510	1 point x3 times x 1 day
A2-3	Hanoi Port	21°N01210	105°E52015	1 point x3 times x 2 days
A2-4	Bat Trang Site	20°N58615	105°E54530	1 point x3 times x 1 day
A2-5	Khuyen Luong Port	21°N00650	105°E52205	1 point x3 times x 2 days
A2-6	New East Port	20°N57010	105°E53710	1 point x3 times x 1 day

Source) ENTEC, August, 2002

Table A39.1.5 Sedimentation Monitoring Results

Sample symbol	Pesticide (µg/kg)	N-hexan (mg/kg)	Cd (mg/kg)	Pb (mg/kg)	Cr (mg/kg)	As (mg/kg)	Hg (mg/kg)	Ignition lose (%)
S2-1.1	0.21	2.31	1.2	43.3	35.6	<0.5	4.7	3.8
S2-1.2	0.11	1.17	2.1	34.4	23.4	<0.5	8.1	2.1
S2-2.1	0.19	1.75	4.1	44.5	28.0	<0.5	<0.5	3.2
S2-2.2	0.21	2.81	4.1	35.5	32.8	<0.5	<0.5	4.1
S2-3.1	0.25	1.05	3.9	25.2	22.8	<0.5	<0.5	3.1
S2-3.2	0.27	1.11	5.1	23.1	24.1	<0.5	<0.5	2.6
S2-4.1	0.27	2.87	<0.5	56.6	37.7	<0.5	<0.5	6.0
S2-4.2	0.18	3.82	0.7	98.3	38.7	<0.5	<0.5	7.6
S2-5.1	0.97	2.37	1.3	67.3	42.3	<0.5	<0.5	7.7
S2-5.2	0.52	1.91	1.0	73.3	34.7	<0.5	<0.5	3.5
S2-6.1	0.37	2.41	0.5	40.8	25.8	<0.5	<0.5	3.2
S2-6.2	0.21	1.62	<0.5	79.5	35.9	<0.5	1.7	6.5

Source) ENTEC, August, 2002

Table A39.1.6 Water Quality Monitoring Results

Parameter	Sample symbol (W2-1)					
	W2-1.1.1	W2-1.1.2	W2-1.1.3	W2-1.2.1	W2.1.2.2	W2.1.2.3
Temperature, °C	26.7	26.6	26.3	27.1	26.9	26.7
Salinity, mg NaCl/l	2.9	2.9	2.9	2.7	2.3	2.7
pH	8.61	8.60	8.59	8.68	8.39	8.31
SS, mg/l	465	503	499	425	476	469
DO, mgO ₂ /l	6.3	5.9	6.0	6.7	5.6	5.5
BOD ₅ , mgO ₂ /l	2	2	2	2	3	2
Nitrogen, mg/l	7.2	7.4	7.8	4.8	5.0	4.6
Phosphorus, mg/l	3.20	3.10	2.92	4.63	4.09	4.41
Coliform, MPN/100ml	7.5x10 ³	9.3x10 ²	9.2x10 ²	1.1x 10 ⁵	9.3x10 ³	1.5x10 ⁴
N-hexan, µg /l	1.2	17.8	16.9	25.0	17.6	16.3
Cd, mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pb, mg/l	0.054	0.050	0.055	0.054	0.052	0.045
Cr, mg/l	0.017	0.015	0.017	0.015	0.016	0.014
As, mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hg, mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Source) ENTEC, August, 2002

Table A39.1.6 (Cont.)

Parameter	Sample symbol (W2-2)					
	W2-2.1.1	W2-2.1.2	W2-2.1.3	W2-2.2.1	W2.2.2.2	W2.2.2.3
Temperature, °C	26.9	26.7	26.4	26.7	26.6	26.3
Salinity, mg/l	2.9	3.1	3.3	2.7	3.1	2.7
pH	8.24	8.25	8.33	8.61	8.60	8.59
SS, mg/l	579	590	604	526	558	617
DO, mgO ₂ /l	6.8	6.5	6.3	6.3	5.9	6.0
BOD ₅ , mgO ₂ /l	2	1	3	1	1	1
Nitrogen, mg/l	13.6	12.0	12.6	8.4	5.6	6.8
Phosphorus, mg/l	4.25	4.74	4.99	4.49	4.80	4.29
Coliform, MPN/100ml	1.5x10 ³	2.4x10 ³	9.3x10 ²	2.4x10 ³	1.1x10 ⁴	4.3x10 ³
N-hexan, µg /l	15.3	15.3	14.6	5.6	5.6	8.5
Cd, mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	0.003
Pb, mg/l	0.062	0.111	0.056	0.065	0.054	0.110
Cr, mg/l	0.021	0.015	0.027	<0.010	<0.010	0.018
As, mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hg, mg/l	<0.001	<0.001	0.003	<0.001	<0.001	<0.001

Source) ENTEC, August, 2002

Table A39.1.6 (Cont.)

Parameter	Sample symbol (W2-3)					
	W2-3.1.1	W2-3.1.2	W2-3.1.3	W2-3.2.1	W2.3.2.2	W2.3.2.3
Temperature, °C	26.3	27.2	26.9	27.9	26.8	26.5
Salinity, mg/l	2.3	2.3	2.0	3.1	2.7	2.5
pH	8.59	8.70	8.10	8.04	8.70	8.10
SS, mg/l	617	640	630	618	627	596
DO, mgO ₂ /l	6.0	6.2	6.1	6.0	5.5	5.3
BOD ₅ , mgO ₂ /l	1	2	1	1	1	1
Nitrogen, mg/l	6.8	8.6	6.2	7.4	12.8	10.2
Phosphorus, mg/l	4.29	4.73	4.25	4.13	5.97	5.11
Coliform, MPN/100ml	4.3x10 ³	4.3x10 ³	2.3x10 ³	7.4x10	7.5x10 ³	4.3x10 ³
N-hexan, µg /l	8.5	8.7	10.6	10.4	4.1	4.6
Cd, mg/l	0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Pb, mg/l	0.110	0.070	0.013	0.075	0.074	0.078
Cr, mg/l	0.018	0.020	0.025	0.25	0.025	0.019
As, mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hg, mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Source) ENTEC, August, 2002

Table A39.1.6 (Cont.)

Parameter	Sample symbol (W2-4)					
	W2-4.1.1	W2-4.1.2	W2-4.1.3	W2-4.2.1	W2.4.2.2	W2.4.2.3
Temperature, °C	26.6	26.4	26.3	26.6	26.4	26.2
Salinity, mg/l	3.3	3.5	3.5	2.5	2.7	2.3
pH	8.60	8.45	8.55	8.61	8.52	8.60
SS, mg/l	585	570	596	502	560	544
DO, mgO ₂ /l	6.1	6.2	5.9	6.2	6.3	6.0
BOD ₅ , mgO ₂ /l	2	2	1	1	1	2
Nitrogen, mg/l	5.6	6.6	3.0	7.8	5.6	5.0
Phosphorus, mg/l	3.10	3.10	3.02	2.85	4.49	4.14
Coliform, MPN/100ml	9.3x10 ²	7.5x10 ³	9.2x10 ²	1.5x10 ²	9.3x10 ²	4.3x10 ³
N-hexan, µg /l	5.1	8.3	7.6	1.9	2.8	4.5
Cd, mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pb, mg/l	0.073	0.069	0.077	0.024	0.053	0.070
Cr, mg/l	0.033	0.027	0.024	0.017	0.025	0.035
As, mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hg, mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Source) ENTEC, August, 2002

Table A39.1.6 (Cont.)

Parameter	Sample symbol (W2-5)					
	W2-5.1.1	W2-5.1.2	W2-5.1.3	W2-5.2.1	W2.5.2.2	W2.5.2.3
Temperature, °C	25.7	25.7	25.3	25.8	25.7	25.4
Salinity, mg/l	2.5	3.1	2.7	2.7	2.9	2.5
pH	8.22	8.25	8.20	8.54	8.50	8.51
SS, mg/l	660	670	571	606	623	680
DO, mgO ₂ /l	5.0	5.0	4.8	6.8	6.6	5.5
BOD ₅ , mgO ₂ /l	2	2	2	2	2	2
Nitrogen, mg/l	2.8	3.0	3.0	2.6	2.8	3.4
Phosphorus, mg/l	4.67	5.11	4.60	3.63	3.71	3.34
Coliform, MPN/100ml	1.5x10 ³	1.5x10 ³	7.4x10	4.3x10 ³	1.5x10 ³	4.3x10 ³
N-hexan, µg /l	4.4	14.6	6.1	3.1	6.1	6.8
Cd, mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pb, mg/l	0.054	0.084	0.083	0.063	0.066	0.093
Cr, mg/l	0.021	0.025	0.020	0.032	0.020	0.021
As, mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hg, mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	0.003

Source) ENTEC, August, 2002

Table A39.1.6 (Cont.)

Parameter	Sample symbol (W2-6)					
	W2-6.1.1	W2-6.1.2	W2-6.1.3	W2-6.2.1	W2.6.2.2	W2.6.2.3
Temperature, °C	27.0	27.0	26.1	26.4	26.3	26.1
Salinity, mg/l	2.7	2.9	2.7	2.0	2.3	2.5
pH	7.78	7.90	7.95	7.82	8.10	8.04
SS, mg/l	416	449	445	460	481	408
DO, mgO ₂ /l	5.8	5.5	5.2	5.6	5.5	5.3
BOD ₅ , mgO ₂ /l	2	2	2	2	3	2
Nitrogen, mg/l	5.4	5.4	5.4	8.12	8.6	6.4
Phosphorus, mg/l	3.07	3.85	2.85	4.16	3.10	4.29
Coliform, MPN/100ml	4.3x10 ³	4.3x10 ³	7.5x10 ³	2.8x10 ⁴	4.3x10 ⁴	1.5x10 ³
N-hexan, µg /l	5.3	24.1	6.8	5.2	7.1	7.0
Cd, mg/l	<0.001	<0.001	<0.001	<0.001	0.003	<0.001
Pb, mg/l	0.085	0.061	0.063	0.064	0.081	0.091
Cr, mg/l	0.018	0.015	0.015	0.013	<0.01	0.018
As, mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hg, mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	0.007

Source) ENTEC, August, 2002

Table A39.1.7 Distribution of Particle Size of Suspended Solid

Sample Diameter of particle (mm)	Particle size fraction (%)					
	>0.10	0.10-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001
W2-1.1.1	2.01	13.54	37.41	17.02	25.01	3.25
W2-1.1.2	3.17	17.62	38.15	13.42	21.80	4.61
W2-1.1.3	6.51	16.32	34.10	14.47	23.76	3.64
W2-1.2.1	3.44	18.02	37.15	12.47	25.70	3.06
W2-1.2.2	4.90	18.65	37.74	12.29	23.61	2.12
W2-1.2.3	7.24	18.04	34.75	12.67	24.01	1.70
W2-2.1.1	4.04	16.0	37.18	14.13	27.30	1.21
W2-2.1.2	6.71	16.40	36.07	13.80	25.10	1.01
W2-2.1.3	8.60	15.11	35.75	11.53	25.07	2.60
W2-2.2.1	2.54	14.36	38.05	15.41	27.10	2.02
W2-2.2.2	3.98	15.16	37.14	16.02	26.15	1.20
W2-2.2.3	7.81	16.48	35.03	14.52	24.01	1.35
W2-3.1.1	1.78	15.09	38.54	12.70	29.58	1.40
W2-3.1.2	2.17	15.71	37.15	12.86	30.02	1.26
W2-3.1.3	3.79	16.08	37.04	13.80	26.75	1.86
W2-3.2.1	3.16	17.40	36.91	11.53	28.17	1.25
W2-3.2.2	4.23	18.30	36.52	11.46	26.41	2.24
W2-3.2.3	5.18	18.40	36.06	10.84	25.57	3.12
W2-4.1.1	2.00	11.68	36.52	20.04	24.81	4.61
W2-4.1.2	3.18	12.84	37.46	17.50	22.64	5.30
W2-4.1.3	4.45	14.80	36.53	15.12	23.00	4.34
W2-4.2.1	0.00	8.70	35.00	19.11	28.54	6.51
W2-4.2.2	0.00	9.08	35.17	19.72	29.10	5.80
W2-4.2.3	1.47	10.03	36.12	17.84	29.78	3.87
W2-5.1.1	1.26	12.71	37.18	14.52	28.17	5.10
W2-5.1.2	2.04	13.45	37.00	13.80	28.47	4.70
W2-5.1.3	9.20	15.10	37.06	12.50	20.01	4.22
W2-5.2.1	1.50	11.71	35.03	18.64	29.51	3.05
W2-5.2.2	2.47	12.09	34.05	17.84	30.12	3.00
W2-5.2.3	4.53	15.18	35.19	15.42	26.70	2.40
W2-6.1.1	3.60	13.71	36.10	18.64	25.51	1.88
W2-6.1.2	4.10	14.80	36.50	18.25	24.01	1.50
W2-6.1.3	6.42	15.12	36.74	18.03	21.57	1.26
W2-6.2.1	1.50	11.71	35.03	18.82	29.51	2.74
W2-6.2.2	2.15	13.09	34.05	17.84	28.78	3.16
W2-6.2.3	5.50	15.10	34.78	16.02	24.81	2.50

Source) ENTEC, August, 2002

Table A39.1.8 Benthos Measurement Data

Sample symbol	Species	Number of species
B2-1.1	- Shrimp, <i>Spirontocaris</i> , Macrine	19
	- <i>Tarebia</i> , Family Thiaidae	4
B2-1.2	- Shrimp, <i>Spirontocaris</i> , Macrine	5
	- Asiatic clam, <i>Corbicula</i> , Family Corbiculidae	57
B2-2.1	No species found	0
B2-2.2	- Shrimp, <i>Spirontocaris</i> , Macrine	23
	- <i>Tarebia</i> , Family Thiaidae	1
B2-3.1	- Shrimp, <i>Spirontocaris</i> , Macrine	37
	- <i>Tarebia</i> , Family Thiaidae	2
B2-3.2	- Shrimp, <i>Spirontocaris</i> , Macrine	48
	- Asiatic clam, <i>Corbicula</i> , Family Corbiculidae	2
	- <i>Tarebia</i> , Family Thiaidae	1
B2-4.1	- Shrimp, <i>Spirontocaris</i> , Macrine	54
	- <i>Tarebia</i> , Family Thiaidae	4
B2-4.2	- Shrimp, <i>Spirontocaris</i> , Macrine	65
	- <i>Tarebia</i> , Family Thiaidae	3
B2-5.1	- Shrimp, <i>Spirontocaris</i> , Macrine	45
	- Asiatic clam, <i>Corbicula</i> , Family Corbiculidae	3
	- <i>Tarebia</i> , Family Thiaidae	2
B2-5.2	- Shrimp, <i>Spirontocaris</i> , Macrine	42
	- <i>Tarebia</i> , Family Thiaidae	6
B2-6.1	- Shrimp, <i>Spirontocaris</i> , Macrine	30
	- Asiatic clam, <i>Corbicula</i> , Family Corbiculidae	1
	- <i>Tarebia</i> , Family Thiaidae	2
B2-6.2	No species found	0

Source) ENTEC, August, 2002

Table A39.1.9 Air Quality Monitoring Results (Day 1)

Sample symbol	Parameter				
	TSP	SO ₂	NO ₂	CO	VOC
A2-1.1	0.13	0.078	0.032	1.02	2.08
A2-1.2	0.16	0.085	0.032	0.93	1.10
A2-1.3	0.14	0.082	0.028	0.93	1.46
A2-2.1	0.21	0.102	0.041	1.76	1.10
A2-2.2	0.24	0.082	0.036	1.57	0.88
A2-2.3	0.23	0.069	0.036	1.57	1.46
A2-3.1	0.21	0.085	0.053	1.67	1.83
A2-3.2	0.28	0.092	0.041	1.96	0.76
A2-3.3	0.18	0.082	0.041	2.16	1.22
A2-4.1	0.18	0.129	0.053	2.37	0.88
A2-4.2	0.21	0.125	0.058	2.06	0.54
A2-4.3	0.16	0.129	0.049	2.26	2.08
A2-5.1	0.21	0.102	0.049	1.76	1.34
A2-5.2	0.26	0.106	0.049	1.57	1.10
A2-5.3	0.19	0.102	0.041	1.76	0.54
A2-6.1	0.28	0.075	0.045	1.29	0.65
A2-6.2	0.31	0.069	0.045	1.11	0.54
A2-6.3	0.24	0.082	0.041	1.38	1.95

Source) ENTEC, August, 2002

Table A39.1.10 Air Quality Monitoring Results (Day 2)

Sample symbol	Parameter				
	TSP	SO ₂	NO ₂	CO	VOC
A2-3.1	0.16	0.092	0.036	1.96	1.83
A2-3.2	0.19	0.102	0.049	1.86	0.54
A2-3.3	0.17	0.088	0.041	1.96	0.66
A2-5.1	0.16	0.099	0.045	1.48	1.70
A2-5.2	0.24	0.092	0.041	1.96	0.88
A2-5.3	0.22	0.092	0.036	1.96	1.83

Source) ENTEC, August, 2002

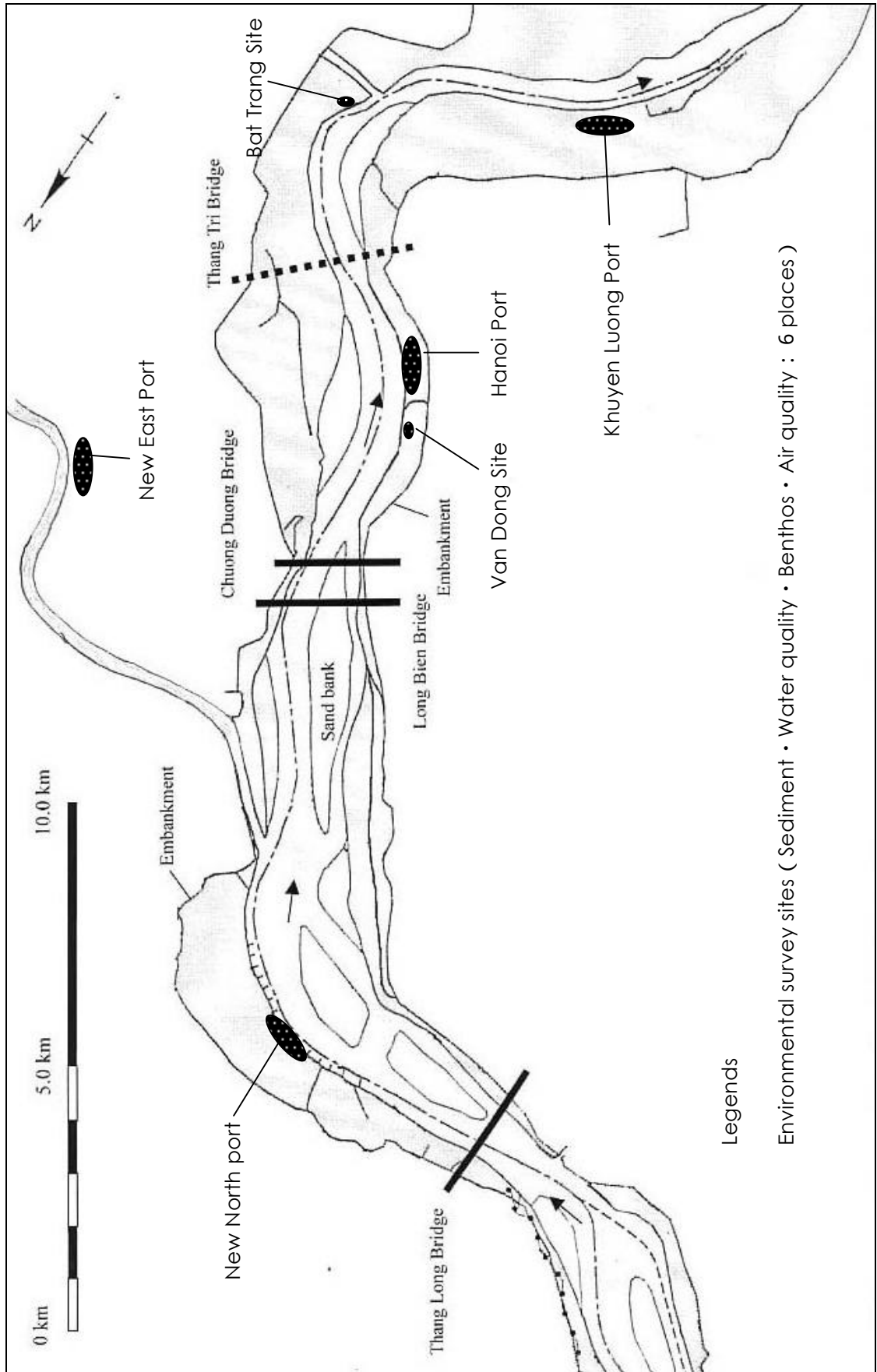


Figure A39.1 Location Map of Environmental Condition Surveys

Appendix 40 Economic Analysis

As supporting and/or complementary data and information for **Chapter 40**, the following tables are provided in this Appendix:

Table A40.1 : Economic Benefit Analysis (Construction Materials)

Table A40.2 : Economic Benefit Analysis (Cement)

Table A40.3 : Economic Benefit Analysis (Coal)

Table A40.4 : Economic Benefit Analysis (Others)

Table A40.5 : Economic Benefit Analysis (Container)

Table A40.6 : Economic Benefit of Passenger Transport

Table A40.7 : Economic Analysis - 2010 (Hanoi Port)

Table A40.8 : Economic Analysis - 2010 (Khuyen Luong Port)

Table A40.9 : Economic Analysis - 2010 (New North Port)

Table A40.10 : Economic Analysis - 2010 (New East Port)

Table A40.11 : Economic Analysis (4 Major Ports in Hanoi Segment) 2010

Table A40.12 : Economic Analysis (Hanoi Segment - 2010)

Table A40.1 Economic Benefit Analysis (Construction Materials)

Year	Calendar Year	Base Data		Transport Cost under Without Situation						Transport Cost under With Situation						Economic Benefit	Economic Benefit Per Ton	
		Cargo Volume Million Tons	Forecast	Transport Cost by Truck for Over-flow Cargo			Transport Cost by Exiting IWT Transport			Transport Cost by Improved IWT			Transport Cost by Improved IWT					
		Million Tons	Million Tons	Cargo Volume Million Tons	Sub-total Truck Cost US\$ Million	Cargo Handling Cost US\$ Million	Transport Cost US\$ Million	Cargo Volume Million Tons	Cargo Transport Million Ton-km	Transport Cost US\$ Million	Cargo Handling Cost US\$ Million	Sub-total IWT Cost US\$ Million	Total Cost (A) US\$ Million	Cargo Transport Million Ton-km	Transport Cost US\$ Million	Cargo Handling Cost US\$ Million	Total Cost (B) US\$ Million	Cost Saved (A)-(B) US\$ Million
2003	2003	4.2																
2007	2007	5.3																
2008	2008	5.5																
2009	2009	5.9																
1	2010	6.5	2.3	233.5	8.1	0.2	8.4	4.2	421.2	4.9	0.6	5.4	13.8	654.7	7.6	0.9	8.5	5.4
2	2011	6.9	2.7	268.6	9.4	0.3	9.6	4.2	421.2	4.9	0.6	5.4	15.1	689.8	7.3	0.9	8.2	6.8
3	2012	7.3	3.1	305.5	10.6	0.3	11.0	4.2	421.2	4.9	0.6	5.4	16.4	726.7	7.1	1.0	8.1	8.4
4	2013	7.7	3.4	344.4	12.0	0.4	12.4	4.2	421.2	4.9	0.6	5.4	17.8	765.6	6.8	1.0	7.9	9.9
5	2014	8.1	3.9	385.4	13.4	0.4	13.8	4.2	421.2	4.9	0.6	5.4	19.3	806.6	6.6	1.1	7.7	11.6
6	2015	8.5	4.3	428.6	14.9	0.5	15.4	4.2	421.2	4.9	0.6	5.4	20.8	849.8	6.4	1.1	7.5	13.3
7	2016	9.0	4.7	474.1	16.5	0.5	17.0	4.2	421.2	4.9	0.6	5.4	22.5	895.3	6.2	1.2	7.4	15.1
8	2017	9.4	5.2	522.0	18.2	0.6	18.7	4.2	421.2	4.9	0.6	5.4	24.2	943.2	6.0	1.3	7.2	17.0
9	2018	9.9	5.7	572.6	19.9	0.6	20.5	4.2	421.2	4.9	0.6	5.4	26.0	993.7	5.8	1.3	7.1	18.9
10	2019	10.5	6.3	625.8	21.8	0.7	22.5	4.2	421.2	4.9	0.6	5.4	27.9	1046.9	5.6	1.4	7.0	20.9
11	2020	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
12	2021	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
13	2022	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
14	2023	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
15	2024	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
16	2025	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
17	2026	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
18	2027	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
19	2028	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
20	2029	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
21	2030	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
22	2031	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
23	2032	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
24	2033	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
25	2034	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
26	2035	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
27	2036	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
28	2037	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
29	2038	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
30	2039	11.0	6.8	681.8	23.7	0.7	24.5	4.2	421.2	4.9	0.6	5.4	29.9	1103.0	5.4	1.5	6.9	23.1
Total		304.3																588.4

Note)

- Cargo Handling Cost*1 (IWT)
Cargo Handling Cost*2 (Truck)
 - Road Distance (Phu To - Viet Tri - Hanoi)
VOC of Typical truck for Construction Material
Load Factor for Truck
 - IWT Distance (Phu To - Viet Tri - Hanoi)
Standard Conversion Factor
 - Conversion of Handling Cost to Net Cost
 - Conversion of Handling Cost of IWT to Truck
 - Economic benefit per ton of cargo
- US\$ 0.13 per ton (in Economic Price)
US\$ 0.11 per ton (in Economic Price)
US\$ 0.01741 per ton-km (6 ton truck)
US\$ 0.10 km
US\$ 0.50
US\$ 100 km
US\$ 0.85
US\$ 0.20
US\$ 0.80
US\$ 1.93 per ton
- Change of SOC (US\$ per ton-km)
2010 0.0116 100 - 300 DWT
2011 0.0106
2012 0.0097
2013 0.0089
2014 0.0082
2015 0.0075
2016 0.0069
2017 0.0063
2018 0.0058
2019 0.0053
2020 0.0049 300 - 500 DWT
0.0067

Table A40.2 Economic Benefit Analysis (Cement)

Year	Base Data		Transport Cost under Without Situation										Transport Cost under With Situation					Economic Benefit		
	Calendar Year	Cargo Volume Million Tons	Cargo Volume	Cargo Transport	Transport Cost	Cargo Handling Cost	Sub-total Truck Cost	Cargo Volume	Cargo Transport	Transport Cost	Cargo Handling Cost	Sub-total IWT Cost	Total Cost (A)	Cargo Transport	Transport Cost	Cargo Handling Cost	Total Cost (B)	Cost Saved (A)-(B)	Per Ton	
		Million Tons	Million Tons	Million Ton-km	US\$ Million	US\$ Million	US\$ Million	Million Tons	Million Ton-km	US\$ Million	US\$ Million	US\$ Million	US\$ Million	Million Ton-km	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$	
2003		1.34																		
2007		1.72																		
2008		1.83																		
2009		1.95																		
1	2010	2.21	0.87	105.0	2.6	0.1	2.7	1.34	200.3	2.3	0.3	2.6	5.3	331.5	3.8	0.5	4.3	1.0	0.43	
2	2011	2.31	0.97	116.7	2.8	0.1	3.0	1.34	200.3	2.3	0.3	2.6	5.6	346.2	3.7	0.5	4.2	1.4	0.60	
3	2012	2.41	1.07	129.0	3.1	0.1	3.3	1.34	200.3	2.3	0.3	2.6	5.9	361.5	3.5	0.6	4.1	1.8	0.76	
4	2013	2.52	1.18	141.8	3.5	0.2	3.6	1.34	200.3	2.3	0.3	2.6	6.2	377.5	3.4	0.6	4.0	2.3	0.91	
5	2014	2.63	1.29	155.2	3.8	0.2	4.0	1.34	200.3	2.3	0.3	2.6	6.6	394.2	3.2	0.6	3.8	2.7	1.05	
6	2015	2.74	1.41	169.1	4.1	0.2	4.3	1.34	200.3	2.3	0.3	2.6	6.9	411.7	3.1	0.6	3.7	3.2	1.17	
7	2016	2.87	1.53	183.7	4.5	0.2	4.7	1.34	200.3	2.3	0.3	2.6	7.3	429.9	3.0	0.7	3.6	3.7	1.29	
8	2017	2.99	1.66	198.9	4.8	0.2	5.1	1.34	200.3	2.3	0.3	2.6	7.7	448.9	2.8	0.7	3.5	4.2	1.39	
9	2018	3.13	1.79	214.8	5.2	0.2	5.5	1.34	200.3	2.3	0.3	2.6	8.1	468.8	2.7	0.7	3.4	4.7	1.49	
10	2019	3.26	1.93	231.4	5.6	0.3	5.9	1.34	200.3	2.3	0.3	2.6	8.5	489.5	2.6	0.8	3.4	5.2	1.59	
11	2020	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
12	2021	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
13	2022	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
14	2023	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
15	2024	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
16	2025	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
17	2026	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
18	2027	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
19	2028	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
20	2029	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
21	2030	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
22	2031	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
23	2032	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
24	2033	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
25	2034	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
26	2035	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
27	2036	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
28	2037	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
29	2038	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
30	2039	3.41	2.07	248.8	6.1	0.3	6.3	1.34	200.3	2.3	0.3	2.6	9.0	511.2	2.5	0.8	3.3	5.7	1.67	
	Total	95.22																144.0		

Note) 1 Cargo Handling Cost*1(IWT) US\$ 0.23 per ton (in Economic Price)
 2 Cargo Handling Cost*2 (Truck) US\$ 0.14 per ton (in Economic Price)
 Road Distance 120 km
 3 VOC of Typical Truck for Cement US\$ 0.01217 per ton-km (6 ton truck)
 Load Factor for Truck 0.50
 4 IWT Distance 150 km
 Standard Conversion Factor 0.85
 5 Conversion of Handling Cost to Net Cost 0.20
 6 Conversion of Handling Cost of IWT to Truck 0.60
 7 Economic benefit per ton of cargo US\$ 1.51 per ton

Change of SOC (US\$ per ton-km)
 2010 0.0116 100 - 300 DWT
 2011 0.0106
 2012 0.0097
 2013 0.0089
 2014 0.0082
 2015 0.0075
 2016 0.0069
 2017 0.0063
 2018 0.0058
 2019 0.0053
 2020 0.0049 300 - 500 DWT
 Difference 0.0067

Table A40.3 Economic Benefit Analysis (Coal)

Year	Transport Cost under Without Situation											Transport Cost under With Situation					Economic Benefit		
	Transport Cost by Truck for Over-flow Cargo				Transport Cost by Existing IWT Transport				Transport Cost by Improved IWT			Total Cost (A)	Cargo Transport Million Ton-km	Transport Cost US\$ Million	Cargo Handling Cost US\$ Million	Total Cost (B)		Cost Saved (A)-(B)	Per Ton
	Cargo Volume Million Tons	Cargo Volume Million Tons	Transport Cost US\$ Million	Cargo Handling Cost US\$ Million	Sub-total Truck Cost US\$ Million	Cargo Volume Million Tons	Cargo Transport Million Ton-km	Transport Cost US\$ Million	Cargo Handling Cost US\$ Million	Sub-total IWT Cost US\$ Million	Cargo Transport Million Ton-km								
2003	0.53																		
2007	0.61																		
2008	0.63																		
2009	0.65																		
1	0.70	0.16	31.1	0.8	0.0	0.8	0.53	112.2	1.3	0.1	1.4	2.2	146.6	1.7	0.1	1.8	0.3	0.50	
2	0.71	0.18	33.9	0.8	0.0	0.8	0.53	112.2	1.3	0.1	1.4	2.2	149.7	1.6	0.1	1.7	0.5	0.73	
3	0.73	0.19	36.8	0.9	0.0	0.9	0.53	112.2	1.3	0.1	1.4	2.3	152.9	1.5	0.1	1.6	0.7	0.95	
4	0.74	0.21	39.7	1.0	0.0	1.0	0.53	112.2	1.3	0.1	1.4	2.4	156.1	1.4	0.1	1.5	0.9	1.15	
5	0.76	0.22	42.7	1.0	0.0	1.1	0.53	112.2	1.3	0.1	1.4	2.4	159.4	1.3	0.1	1.4	1.0	1.34	
6	0.78	0.24	45.7	1.1	0.0	1.2	0.53	112.2	1.3	0.1	1.4	2.5	162.8	1.2	0.1	1.3	1.2	1.52	
7	0.79	0.26	48.9	1.2	0.0	1.3	0.53	112.2	1.3	0.1	1.4	2.6	166.3	1.1	0.1	1.3	1.3	1.68	
8	0.81	0.27	52.1	1.3	0.0	1.3	0.53	112.2	1.3	0.1	1.4	2.7	169.8	1.1	0.1	1.2	1.5	1.83	
9	0.83	0.29	55.3	1.3	0.0	1.4	0.53	112.2	1.3	0.1	1.4	2.8	173.4	1.0	0.1	1.1	1.6	1.97	
10	0.84	0.31	58.6	1.4	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.8	177.1	0.9	0.1	1.1	1.8	2.10	
11	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
12	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
13	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
14	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
15	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
16	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
17	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
18	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
19	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
20	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
21	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
22	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
23	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
24	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
25	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
26	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
27	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
28	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
29	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
30	0.86	0.33	62.0	1.5	0.0	1.5	0.53	112.2	1.3	0.1	1.4	2.9	180.8	0.9	0.1	1.0	1.9	2.22	
Total	24.91																49.0	1.94	

Note)

- Cargo Handling Cost*1 (IWT) US\$ 0.16 per ton (in Economic Price)
- Cargo Handling Cost*2 (Truck) US\$ 0.10 per ton (in Economic Price)
- Road Distance (Quang Ninh - Hanoi) 190 km
- VOC of Typical Truck for Coal US\$ 0.01217 per ton-km (6 ton truck)
- Load Factor for Truck 0.50
- IWT Distance (Quang Ninh - Hanoi) 210 km
- Standard Conversion Factor 0.85
- Conversion of Handling Cost to Net Cost 0.20
- Conversion of Handling Cost of IWT to Truck 0.60
- Economic benefit per ton of cargo US\$ 1.97 per ton

Change of SOC (US\$ per ton-km)

2010	0.0116	100 - 300 DWT
2011	0.0106	
2012	0.0097	
2013	0.0089	
2014	0.0082	
2015	0.0075	
2016	0.0069	
2017	0.0063	
2018	0.0058	
2019	0.0053	300 - 500 DWT
2020	0.0049	300 - 500 DWT
Difference	0.0067	

Table A40.4 Economic Benefit Analysis (Others)

Year	Calendar Year	Transport Cost under Without Stimulation										Transport Cost under With Situation					Economic Benefit		
		Transport Cost by Truck for Over-flow Cargo					Transport Cost by Existing IWT Transport					Transport Cost by Improved IWT							
Forecast	Cargo Volume Million Tons	Cargo Volume Million Tons	Cargo Handling Cost US\$ Million	Transport Cost US\$ Million	Sub-total Truck Cost US\$ Million	Cargo Volume Million Tons	Cargo Transport Million Ton-km	Cargo Transport US\$ Million	Transport Cost US\$ Million	Cargo Handling Cost US\$ Million	Sub-total IWT Cost US\$ Million	Total Cost US\$ Million	Cargo Transport Million Ton-km	Transport Cost US\$ Million	Cargo Handling Cost US\$ Million	Total Cost US\$ Million	Cost Saved (A)-(B) US\$ Million	Economic Benefit Per Ton US\$	
2003	0.58																		
2007	0.65																		
2008	0.67																		
2009	0.70																		
1	2010	0.74	0.16	19.1	0.7	0.0	0.7	0.58	87.0	0.8	0.2	1.0	1.7	110.9	1.0	0.3	1.2	0.4	0.60
2	2011	0.77	0.19	27.0	0.8	0.1	0.9	0.58	87.0	0.8	0.2	1.0	1.8	115.7	1.0	0.3	1.2	0.6	0.76
3	2012	0.81	0.23	23.0	0.9	0.1	1.0	0.58	87.0	0.8	0.2	1.0	2.0	120.8	0.9	0.3	1.2	0.7	0.92
4	2013	0.84	0.26	31.3	1.1	0.1	1.2	0.58	87.0	0.8	0.2	1.0	2.1	126.1	0.9	0.3	1.2	0.9	1.07
5	2014	0.88	0.30	35.7	1.2	0.1	1.3	0.58	87.0	0.8	0.2	1.0	2.3	131.6	0.9	0.3	1.2	1.1	1.21
6	2015	0.92	0.34	40.3	1.4	0.1	1.5	0.58	87.0	0.8	0.2	1.0	2.5	137.4	0.9	0.3	1.2	1.2	1.34
7	2016	0.96	0.38	45.1	1.6	0.1	1.7	0.58	87.0	0.8	0.2	1.0	2.6	143.4	0.9	0.3	1.2	1.4	1.47
8	2017	1.00	0.42	50.1	1.7	0.1	1.9	0.58	87.0	0.8	0.2	1.0	2.8	149.7	0.9	0.3	1.2	1.6	1.60
9	2018	1.04	0.46	55.4	1.9	0.1	2.1	0.58	87.0	0.8	0.2	1.0	3.0	156.2	0.9	0.4	1.2	1.8	1.72
10	2019	1.09	0.51	60.9	2.1	0.1	2.3	0.58	87.0	0.8	0.2	1.0	3.2	163.1	0.8	0.4	1.2	2.0	1.83
11	2020	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
12	2021	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
13	2022	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
14	2023	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
15	2024	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
16	2025	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
17	2026	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
18	2027	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
19	2028	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
20	2029	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
21	2030	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
22	2031	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
23	2032	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
24	2033	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
25	2034	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
26	2035	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
27	2036	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
28	2037	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
29	2038	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
30	2039	1.14	0.55	66.6	2.3	0.2	2.5	0.58	87.0	0.8	0.2	1.0	3.4	170.3	0.8	0.4	1.2	2.2	1.94
Total	31.7																	55.9	1.71

Note)

- Cargo Handling Cost*1(IWT) US\$ 0.34 per ton (in Economic Price)
 - Cargo Handling Cost*2 (Truck) US\$ 0.27 per ton (in Economic Price)
 - Road Distance 120 km
 - VOC of Typical Truck for Others US\$ 0.01741 per ton-km (6 ton truck)
 - Load Factor for Truck 0.50
 - IWT Distance 150 km
 - Standard Conversion Factor 0.85
 - Conversion of Handling Cost to Net Cost 0.20
 - Conversion of Handling Cost of IWT to Truck 0.80
 - Economic benefit per ton of cargo US\$ 1.71 per ton
- Change of SOC (US\$ per ton-km)
- | | |
|------------|--------|
| 2010 | 0.0088 |
| 2011 | 0.0083 |
| 2012 | 0.0078 |
| 2013 | 0.0074 |
| 2014 | 0.0070 |
| 2015 | 0.0066 |
| 2016 | 0.0062 |
| 2017 | 0.0058 |
| 2018 | 0.0055 |
| 2019 | 0.0052 |
| 2020 | 0.0049 |
| Difference | 0.0039 |
- 0.0049 300 - 500 DWT

Table A40.5 Economic Benefit Analysis (Container)

Year	Calendar Year	Transport Cost under Without Situation										Transport Cost under With Situation					Economic Benefit Per Ton US\$		
		Base Data					Transport Cost by Truck for Over-flow Cargo					Transport Cost by Existing IWT Transport						Transport Cost by Improved IWT	
Forecast		Cargo Volume Million Tons	Cargo Volume Million Tons	Cargo Volume Million Tons	Cargo Handling Cost US\$ Million	Transport Cost US\$ Million	Sub-total Truck Cost US\$ Million	Cargo Transport Million Ton-km	Cargo Transport Cost US\$ Million	Transport Cost US\$ Million	Cargo Handling Cost US\$ Million	Sub-total IWT Cost US\$ Million	Total Cost (A) US\$ Million	Cargo Transport Million Ton-km	Transport Cost US\$ Million	Cargo Handling Cost US\$ Million	Total Cost (B) US\$ Million	Economic Benefit Cost Saved (A)-(B) US\$ Million	
2003																			
2007																			
2008																			
2009																			
1	2010	0.32	38.4	0.32	0.30	0.69	0.99	0.0	0.0	0.0	0.0	1.00	48.0	0.23	0.30	0.53	0.47	1.47	
2	2011	0.34	41.3	0.34	0.32	0.75	1.07	0.0	0.0	0.0	0.0	1.07	51.7	0.24	0.32	0.56	0.51	1.48	
3	2012	0.37	44.5	0.37	0.35	0.80	1.15	0.0	0.0	0.0	0.0	1.15	55.6	0.25	0.35	0.60	0.55	1.49	
4	2013	0.40	47.9	0.40	0.37	0.86	1.24	0.0	0.0	0.0	0.0	1.24	59.9	0.27	0.37	0.64	0.60	1.51	
5	2014	0.43	51.6	0.43	0.40	0.93	1.33	0.0	0.0	0.0	0.0	1.33	64.5	0.28	0.40	0.68	0.65	1.52	
6	2015	0.46	55.6	0.46	0.43	1.00	1.44	0.0	0.0	0.0	0.0	1.44	69.5	0.30	0.43	0.73	0.71	1.53	
7	2016	0.50	59.8	0.50	0.47	1.08	1.55	0.0	0.0	0.0	0.0	1.55	74.8	0.31	0.47	0.78	0.77	1.54	
8	2017	0.54	64.4	0.54	0.50	1.16	1.66	0.0	0.0	0.0	0.0	1.66	80.5	0.33	0.50	0.83	0.84	1.56	
9	2018	0.58	69.4	0.58	0.54	1.25	1.79	0.0	0.0	0.0	0.0	1.80	86.7	0.35	0.54	0.89	0.91	1.57	
10	2019	0.62	74.7	0.62	0.58	1.35	1.93	0.0	0.0	0.0	0.0	1.93	93.3	0.37	0.58	0.95	0.98	1.58	
11	2020	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
12	2021	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
13	2022	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
14	2023	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
15	2024	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
16	2025	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
17	2026	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
18	2027	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
19	2028	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
20	2029	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
21	2030	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
22	2031	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
23	2032	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
24	2033	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
25	2034	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
26	2035	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
27	2036	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
28	2037	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
29	2038	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
30	2039	0.67	80.4	0.67	0.63	1.45	2.08	0.0	0.0	0.0	0.0	2.08	100.5	0.39	0.63	1.02	1.07	1.59	
Total		17.96															28.32	1.57	

Note)

- 1 Cargo Handling Cost*(IWT) US\$ 0.94 per ton (in Economic Price)
 - 2 Cargo Handling Cost*2 (Truck) US\$ 0.94 per ton (in Economic Price)
 - 3 Road Distance (Hai Phong - Hanoi) 120 km
 - 4 VOC of Typical truck for Container US\$ 0.00902 Container Trailer
 - 5 Load Factor for Truck 0.50
 - 6 IWT Distance 150 km
 - 7 Standard Conversion Factor 0.85
 - 8 Conversion of Handling Cost to Net Cost 0.50
 - 9 Conversion of Handling Cost of IWT to Truck 1.00
 - 10 Economic benefit per ton of cargo US\$ 1.57 per ton
- Change of SOC (US\$ per ton-km)
- 2010 0.0048 600 DWT
 - 2011 0.0047
 - 2012 0.0046
 - 2013 0.0045
 - 2014 0.0044
 - 2015 0.0043
 - 2016 0.0042
 - 2017 0.0041
 - 2018 0.0040
 - 2019 0.0039
 - 2020 0.0039 800 DWT
- Difference 0.0009

Table A40.6 Economic Benefit of Passenger Transport

Year	Passenger Demand of IWT ('000)					Million	Transport
	HAN-HYN	HAN-TBN	HAN-VTR	HAN-PHT	TOTAL	Pax-km	Cost
							0.005044
Dist. (km)	60	101	75	115	351		
2010	210	159	135	101	605	212	1.07
2011	218	165	140	104	627	220	1.11
2012	227	170	144	108	650	228	1.15
2013	236	176	149	112	673	236	1.19
2014	245	182	154	115	697	245	1.23
2015	255	189	160	119	723	254	1.28
2016	265	195	165	123	749	263	1.33
2017	275	202	171	128	776	272	1.37
2018	286	209	177	132	804	282	1.42
2019	297	216	183	136	833	292	1.47
2020	309	224	189	141	863	303	1.53

Year	Passenger Transported by Road Bus					Million	Transport	Saving
	HAN-HYN	HAN-TBN	HAN-VTR	HAN-PHT	TOTAL	Pax-km	Cost	Million
							0.005780	US\$
Dist. (km)	64	109	84	123	380			
2010	210	159	135	101	605	230	1.33	0.26
2011	218	165	140	104	627	238	1.38	0.27
2012	227	170	144	108	650	247	1.43	0.28
2013	236	176	149	112	673	256	1.48	0.29
2014	245	182	154	115	697	265	1.53	0.30
2015	255	189	160	119	723	275	1.59	0.31
2016	265	195	165	123	749	284	1.64	0.32
2017	275	202	171	128	776	295	1.70	0.33
2018	286	209	177	132	804	305	1.77	0.34
2019	297	216	183	136	833	316	1.83	0.35
2020	309	224	189	141	863	328	1.90	0.37

Legend:

HAN - HYN Hanoi - Hun Yen
HAN - TBN Hanoi - Thai Binh
HAN - VTR Hanoi - Viet Tri
HAN - PHT Hanoi - Phu To

Note:

- 1) Transport cost shown above is in US\$ per passenger - km.
- 2) Saving of transport cost equals to the economic benefits of IWT passenger transport.

Table A40.7 Economic Analysis - 2010 (Hanoi Port)

Year	Base Data		Cargo Volume					Economic Benefit by Type or Cargo					Pax			Cost (US\$ Million)					Balance		Discounted						
	Cargo Volume (Million Tons)		Const. Mat.	Cement	Coal	Others	Cont.	Const. Mat.	Cement	Coal	Others	Cont.	Benefit (US\$ Million)	Benefit (US\$ Million)	Benefit (US\$ Million)	Total	Initial Investmt	Maint. Cost	Maint. Dredging	Total Cost	Net Benefit	Cost 10% D.R.	Benefit 10% D.R.	Net Benefit	Benefit 10% D.R.	Net Benefit 10% D.R.			
2008																													
2009																													
1	2010	0.84	0.40	0.20	0.20	0.05	0.00	0.32	0.09	0.10	0.03	0.00	0.54	0.26	0.80					2.79	-2.79	2.79	0	-2.79	0	-2.79	0		
2	2011	0.83	0.37	0.21	0.19	0.05	0.00	0.37	0.13	0.14	0.04	0.00	0.68	0.27	0.95					5.61	-5.61	5.10	0	-5.61	0	-5.10	0		
3	2012	0.82	0.35	0.23	0.18	0.06	0.00	0.40	0.18	0.17	0.06	0.00	0.81	0.28	1.09					2.82	0.63	2.82	0.14	0.45	0.13	0.45	0.31		
4	2013	0.82	0.33	0.25	0.17	0.07	0.00	0.43	0.22	0.20	0.08	0.00	0.93	0.29	1.21					2.79	0.78	2.79	0.13	0.51	0.13	0.51	0.38		
5	2014	0.82	0.31	0.27	0.16	0.08	0.00	0.45	0.28	0.22	0.10	0.00	1.04	0.30	1.34					2.79	0.92	2.79	0.11	0.55	0.11	0.55	0.44		
6	2015	0.83	0.29	0.29	0.15	0.09	0.00	0.46	0.34	0.23	0.12	0.00	1.15	0.31	1.46					2.82	1.09	2.82	0.09	0.58	0.09	0.58	0.49		
7	2016	0.83	0.29	0.29	0.15	0.09	0.00	0.50	0.37	0.26	0.14	0.00	1.26	0.32	1.58					2.82	1.29	2.82	0.08	0.59	0.08	0.59	0.51		
8	2017	0.83	0.29	0.29	0.15	0.09	0.00	0.53	0.40	0.28	0.15	0.00	1.36	0.33	1.69					2.82	1.41	2.82	0.07	0.58	0.07	0.58	0.50		
9	2018	0.83	0.29	0.29	0.15	0.09	0.00	0.56	0.43	0.30	0.16	0.00	1.45	0.34	1.79					2.82	1.52	2.82	0.06	0.56	0.06	0.56	0.49		
10	2019	0.83	0.29	0.29	0.15	0.09	0.00	0.59	0.45	0.32	0.17	0.00	1.53	0.35	1.89					2.82	1.62	2.82	0.06	0.56	0.06	0.56	0.48		
11	2020	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.72	2.82	0.05	0.51	0.05	0.51	0.46		
12	2021	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.05	0.51	0.05	0.51	0.46		
13	2022	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.05	0.51	0.05	0.51	0.46		
14	2023	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.04	0.42	0.04	0.42	0.38		
15	2024	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.04	0.39	0.04	0.39	0.35		
16	2025	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.03	0.32	0.03	0.32	0.30		
17	2026	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.03	0.29	0.03	0.29	0.29		
18	2027	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.03	0.29	0.03	0.29	0.26		
19	2028	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.03	0.26	0.03	0.26	0.24		
20	2029	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.02	0.24	0.02	0.24	0.21		
21	2030	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.02	0.20	0.02	0.20	0.20		
22	2031	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.02	0.20	0.02	0.20	0.18		
23	2032	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.02	0.18	0.02	0.18	0.16		
24	2033	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.02	0.16	0.02	0.16	0.15		
25	2034	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.02	0.15	0.02	0.15	0.13		
26	2035	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.01	0.14	0.01	0.14	0.12		
27	2036	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.01	0.12	0.01	0.12	0.11		
28	2037	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.01	0.11	0.01	0.11	0.10		
29	2038	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.01	0.10	0.01	0.10	0.09		
30	2039	0.83	0.29	0.29	0.15	0.09	0.00	0.62	0.48	0.34	0.18	0.00	1.61	0.37	1.98					2.82	1.81	2.82	0.01	0.09	0.01	0.09	0.08		
Total	24.81		9.13	8.32	4.72	2.63	0.00	16.94	12.46	8.97	4.64	0.00	43.01	10.38	53.39	5.57	5.65	11.22	5.04	16.26	37.14	9.94	10.34	37.14	9.94	0.40			

Phase-I

Initial capital investment (US\$ Million)	NET	GROSS	Economic
Civil Engineering Works	8.03	9.88	8.40
Mechanical Works	5.33	6.56	5.57
Maintenance expenses (% in total capital)	2.70	3.32	2.82
Maintenance dredging per year			0.00

Economic Analysis Indicator		
Project Life	Years	
ERRR	30	
NPV at 10%		13.59%
B/C Ratio at 10%		1.04

Table A40.8 Economic Analysis - 2010 (Khuyen Luong Port)

Year	Base Data		Cargo Volume					Economic Benefit by Tye or Cargo					Cost (US\$ Million)				Balance		Discounted Cost			
	Cargo Volume (Million Tons)	Const. Mat.	Cement	Coal	Others	Cont.	Const. Mat.	Cement	Coal	Others	Cont.	Benefit (US\$ Million)	CW	Mech	Total	Maint. Cost	Maint. Dredging	Total Cost	Net Benefit	Cost 10% D.R.	Benefit 10% D.R.	Net Benefit 10% D.R.
1	2008												2.92		2.92			2.92	-2.92	2.92	0	-2.92
2	2009												2.92	3.45	6.37			6.37	-6.37	5.79	0	-5.79
1	2010	1.15	0.78	0.20	0.13	0.05	0.00	0.44	0.09	0.04	0.03	0.00			0.19	0.00	0.19	0.63	0.15	0.67	0.52	
2	2011	1.25	0.85	0.21	0.13	0.05	0.00	0.84	0.18	0.10	0.04	0.00			0.19	0.00	0.19	0.93	0.14	0.83	0.70	
3	2012	1.37	0.93	0.23	0.14	0.06	0.00	1.07	0.13	0.06	0.06	0.00			0.19	0.00	0.19	1.25	0.13	0.98	0.86	
4	2013	1.37	0.93	0.23	0.14	0.06	0.00	1.21	0.21	0.16	0.07	0.00			0.19	0.00	0.19	1.46	0.12	1.02	0.91	
5	2014	1.37	0.93	0.23	0.14	0.06	0.00	1.34	0.24	0.19	0.07	0.00			0.19	0.00	0.19	1.66	0.10	1.04	0.94	
6	2015	1.37	0.93	0.23	0.14	0.06	0.00	1.46	0.27	0.21	0.08	0.00			0.19	0.00	0.19	1.84	0.10	1.04	0.94	
7	2016	1.37	0.93	0.23	0.14	0.06	0.00	1.57	0.30	0.24	0.09	0.00			0.19	0.00	0.19	2.01	0.09	1.02	0.94	
8	2017	1.37	0.93	0.23	0.14	0.06	0.00	1.68	0.32	0.26	0.10	0.00			0.19	0.00	0.19	2.17	0.08	1.00	0.92	
9	2018	1.37	0.93	0.23	0.14	0.06	0.00	1.78	0.34	0.28	0.11	0.00			0.19	0.00	0.19	2.32	0.07	0.96	0.89	
10	2019	1.37	0.93	0.23	0.14	0.06	0.00	1.87	0.36	0.29	0.11	0.00			0.19	0.00	0.19	2.45	0.07	0.92	0.86	
11	2020	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.06	0.88	0.82	
12	2021	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.05	0.80	0.75	
13	2022	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.05	0.73	0.68	
14	2023	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.04	0.66	0.62	
15	2024	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00		3.45	0.19	0.00	3.64	-0.87	0.79	0.60	-0.19	
16	2025	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.04	0.55	0.51	
17	2026	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.03	0.50	0.46	
18	2027	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.03	0.45	0.42	
19	2028	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.03	0.41	0.38	
20	2029	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.03	0.37	0.35	
21	2030	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.02	0.34	0.32	
22	2031	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.02	0.31	0.29	
23	2032	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.02	0.28	0.26	
24	2033	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.02	0.26	0.24	
25	2034	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.02	0.23	0.22	
26	2035	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.01	0.21	0.20	
27	2036	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.01	0.19	0.18	
28	2037	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.01	0.17	0.16	
29	2038	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.01	0.16	0.15	
30	2039	1.37	0.93	0.23	0.14	0.06	0.00	1.95	0.38	0.31	0.12	0.00			0.19	0.00	0.19	2.58	0.01	0.14	0.13	
Total		40.64	27.77	6.84	4.20	1.83	0.00	52.50	10.10	8.16	3.16	0.00	5.84	6.90	12.74	5.58	0.00	18.32	55.59	11.06	17.76	6.70

Economic Analysis Indicator	
Project Life	30
ERR	16.33%
NPV of	6.70
B/C Ratio of	1.61

Phase-I	NET	GROSS	Economic
Initial capital investment (US\$ Million)	8.89	10.93	9.29
Civil Engineering Works	5.59	6.88	5.84
Mechanical Works	3.30	4.06	3.45
Maintenance expenses (% in total capital)			2%
Maintenance dredging per year			0.00

Table A40.9 Economic Analysis - 2010 (New North Port)

Year	Base Data	Cargo Volume					Economic Benefit by Tye or Cargo					Cost (US\$ Million)				Balance			Discounted Cost				
		Cargo Volume (Million Tons)	Const. Mat.	Cement	Coal	Others	Const. Mat.	Cement	Coal	Others	Cont.	Benefit (US\$ Million)	Initial Investment	Maint. Cost	Maint. Dredging	Total Cost	Net Benefit	Cost 10% D.R.	Benefit 10% D.R.	Net Benefit 10% D.R.			
1	2008																						
2	2009																						
1	2010	1.13	0.97	0.10	0.03	0.02	0.00	0.04	0.02	0.01	0.00	0.87	3.57		3.57	3.57				3.57	0	-3.57	
2	2011	1.25	1.08	0.11	0.04	0.03	0.00	0.07	0.03	0.02	0.00	1.18								6.66	6.05	0	-6.05
3	2012	1.39	1.20	0.12	0.04	0.03	0.00	0.10	0.04	0.03	0.00	1.54								0.20	0.17	0.72	0.55
4	2013	1.39	1.20	0.12	0.04	0.03	0.00	0.11	0.04	0.03	0.00	1.74								0.20	0.14	1.05	0.89
5	2014	1.39	1.20	0.12	0.04	0.03	0.00	0.13	0.05	0.03	0.00	1.94								0.20	0.13	1.08	0.96
6	2015	1.39	1.20	0.12	0.04	0.03	0.00	0.15	0.06	0.04	0.00	2.12								0.20	0.12	1.09	0.98
7	2016	1.39	1.20	0.12	0.04	0.03	0.00	0.16	0.06	0.04	0.00	2.29								0.20	0.10	1.07	0.97
8	2017	1.39	1.20	0.12	0.04	0.03	0.00	0.17	0.07	0.04	0.00	2.44								0.20	0.09	1.04	0.95
9	2018	1.39	1.20	0.12	0.04	0.03	0.00	0.19	0.08	0.05	0.00	2.59								0.20	0.08	1.00	0.92
10	2019	1.39	1.20	0.12	0.04	0.03	0.00	0.20	0.08	0.05	0.00	2.73								0.20	0.07	0.96	0.88
11	2020	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.07	0.91	0.84
12	2021	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.06	0.83	0.77
13	2022	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.05	0.75	0.70
14	2023	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.05	0.68	0.63
15	2024	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86	3.09		3.09	3.30	-0.44			0.20	0.72	0.62	-0.10
16	2025	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.04	0.56	0.52
17	2026	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.04	0.51	0.48
18	2027	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.03	0.47	0.43
19	2028	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.03	0.42	0.39
20	2029	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.03	0.39	0.36
21	2030	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.03	0.35	0.33
22	2031	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.02	0.32	0.30
23	2032	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.02	0.29	0.27
24	2033	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.02	0.26	0.24
25	2034	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.02	0.24	0.22
26	2035	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.02	0.22	0.20
27	2036	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.01	0.20	0.18
28	2037	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.01	0.18	0.17
29	2038	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	0.00	2.86								0.20	0.01	0.16	0.15
30	2039	1.39	1.20	0.12	0.04	0.03	0.00	0.21	0.08	0.05	1.00	3.86								0.20	0.01	0.20	0.19
Total		41.31	35.65	3.70	1.14	0.83	0.00	67.42	5.47	2.22	1.44	77.55	7.13	6.19	13.32	6.13	0.00	0.00	0.00	19.45	12.05	18.55	6.51

Economic Analysis Indicator	
Project Life	Years
EIRR	15.62%
NPV at	10%
B/C Ratio at	10%

Phase-I	NET		GROSS		Economic	
	Initial capital investment (US\$ Million)	9.78	12.03	10.22	10.22	10.22
Civil Engineering Works	6.82	8.39	7.13	7.13	7.13	7.13
Mechanical Works	2.96	3.64	3.09	3.09	3.09	3.09
Maintenance expenses (% in total capital)						
Maintenance dredging per year						0.00

Table A40.10 Economic Analysis - 2010 (New East Port)

Year	Base Data	Cargo Volume				Economic Benefit by Tye or Cargo						Cost (US\$ Million)				Balance		Discounted Cost				
		Cargo Volume (Million Tons)	Const. Mat.	Cement	Coal	Others	Cont.	Const. Mat.	Cement	Coal	Others	Cont.	Benefit (US\$ Million)	Initial Investmt	Maint. Cost	Maint. Dredging	Total Cost	Net Benefit	Cost 10% D.R.	Benefit 10% D.R.	Net Benefit 10% D.R.	
1	2008																					
2	2009																					
1	2010	1.28	0.19	0.50	0.16	0.12	0.32	1.05	0.21	0.08	0.07	0.47	1.88			9.37	-3.85	3.85	0	0	-3.85	
2	2011	1.39	0.22	0.53	0.17	0.12	0.34	1.37	0.32	0.12	0.09	0.51	2.42				9.37	5.52	8.52	0	-8.52	
3	2012	1.50	0.26	0.56	0.18	0.13	0.37	1.72	0.43	0.17	0.12	0.55	2.99									
4	2013	1.50	0.26	0.56	0.18	0.13	0.37	1.94	0.51	0.20	0.14	0.56	3.35									
5	2014	1.50	0.26	0.56	0.18	0.13	0.37	2.15	0.59	0.24	0.15	0.56	3.69									
6	2015	1.50	0.26	0.56	0.18	0.13	0.37	2.34	0.66	0.27	0.17	0.57	4.01									
7	2016	1.50	0.26	0.56	0.18	0.13	0.37	2.52	0.72	0.30	0.19	0.57	4.31									
8	2017	1.50	0.26	0.56	0.18	0.13	0.37	2.69	0.78	0.32	0.20	0.58	4.58									
9	2018	1.50	0.26	0.56	0.18	0.13	0.37	2.85	0.84	0.35	0.22	0.58	4.84									
10	2019	1.50	0.26	0.56	0.18	0.13	0.37	2.99	0.89	0.37	0.23	0.59	5.08									
11	2020	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
12	2021	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
13	2022	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
14	2023	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
15	2024	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30	5.52								
16	2025	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
17	2026	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
18	2027	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
19	2028	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
20	2029	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
21	2030	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
22	2031	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
23	2032	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
24	2033	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
25	2034	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
26	2035	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
27	2036	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
28	2037	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
29	2038	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
30	2039	1.50	0.26	0.56	0.18	0.13	0.37	3.13	0.94	0.39	0.25	0.59	5.30									
Total		44.61	7.70	16.76	5.30	3.80	11.05	84.27	24.73	10.29	6.53	17.35	143.18	7.71	11.04	18.75	7.94	0.00	26.68	116.50	15.84	35.06

Economic Analysis Indicator	
Project Life	30 Years
EIRR	22.12%
NPV at	10%
B/C Ratio at	10%

	NET	GROSS	Economic
Initial capital investment (US\$ Million)	12.65	15.56	13.23
Civil Engineering Works	7.37	9.07	7.71
Mechanical Works	5.28	6.49	5.52
Maintenance expenses (% in total capital)			2%
Maintenance dredging per year			0.00

Phase-I

Table A40.11 Economic Analysis (4 Major Port in Hanoi Segment) 2010

Year	Base Data		Cargo Volume						Economic Benefit by Type of Cargo						PAX	Total	Cost (US\$ Million)				Balance		Discounted Cost	
	Cargo Volume (Million Tons)	Cargo Volume (Billion Ton-kms)	Const. Mat.	Cement	Cod	Others	Cont.	Const. Mat.	Cement	Cod	Others	Cont.	Benefit (US\$ Million)	Benefit (US\$ Million)			Benefit (US\$ Million)	Initial Investmt	Maint. Cost	Maint. Dredging	Total Cost	Net Benefit	Benefit 10% D.R.	Cost 10% D.R.
2008																13.13			13.13	-13.13		13.13	0	-13.13
2009																28.01			28.01	-28.01		25.47	0	-25.47
1	4.40	0.57	2.34	0.99	0.52	0.23	0.32	0.32	4.52	1.50	1.02	0.40	0.50	7.94	0.26	8.20	0.82	0.00	0.82	0.82	7.37	0.68	6.77	6.09
2	4.72	0.61	2.53	1.06	0.53	0.25	0.34	0.34	4.89	1.61	1.04	0.44	0.54	8.51	0.27	8.78	0.82	0.00	0.82	0.82	7.96	0.62	6.60	5.98
3	5.08	0.66	2.74	1.15	0.54	0.28	0.37	0.37	5.31	1.73	1.06	0.48	0.58	9.16	0.28	9.43	0.82	0.00	0.82	0.82	8.61	0.56	6.44	5.88
4	5.07	0.66	2.73	1.16	0.53	0.29	0.37	0.37	5.27	1.76	1.04	0.49	0.58	9.14	0.29	9.43	0.82	0.00	0.82	0.82	8.60	0.51	5.85	5.34
5	5.08	0.66	2.71	1.18	0.52	0.30	0.37	0.37	5.23	1.79	1.02	0.51	0.58	9.13	0.30	9.43	0.82	0.00	0.82	0.82	8.61	0.46	5.32	4.86
6	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.31	9.44	0.82	0.00	0.82	0.82	8.62	0.42	4.84	4.42
7	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.32	9.45	0.82	0.00	0.82	0.82	8.63	0.38	4.41	4.02
8	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.33	9.46	0.82	0.00	0.82	0.82	8.64	0.35	4.01	3.66
9	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.34	9.47	0.82	0.00	0.82	0.82	8.65	0.32	3.65	3.33
10	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.35	9.48	0.82	0.00	0.82	0.82	8.66	0.29	3.32	3.04
11	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.26	3.03	2.76
12	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.24	2.75	2.51
13	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.22	2.50	2.28
14	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.20	2.27	2.08
15	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	14.89	0.82	0.00	15.71	-6.21	-3.42	2.07	-1.35
16	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.16	1.88	1.72
17	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.15	1.71	1.56
18	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.13	1.55	1.42
19	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.12	1.41	1.29
20	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.11	1.28	1.17
21	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.10	1.17	1.07
22	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.09	1.06	0.97
23	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.08	0.96	0.88
24	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.08	0.88	0.80
25	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.07	0.80	0.73
26	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.06	0.72	0.66
27	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.06	0.66	0.60
28	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.05	0.60	0.55
29	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.05	0.54	0.50
30	5.08	0.66	2.69	1.20	0.51	0.31	0.37	0.37	5.20	1.82	1.00	0.53	0.58	9.13	0.37	9.50	0.82	0.00	0.82	0.82	8.67	0.04	0.49	0.45
Total	151.37	19.62	80.25	35.61	15.36	9.10	11.05	11.05	155.16	53.85	30.20	15.59	17.34	272.14	10.38	282.52	56.03	24.68	80.71	201.81	48.89	79.57	30.69	30.69

Economic Analysis Indicator	
Project Life	Years
ERR	18.54%
NPV at	10%
B/C Ratio at	1.63

Phase-I	NET		GROSS		Economic
	Initial capital investment (US\$ Million)	39.35	48.40	41.14	
	Civil Engineering Works	25.11	30.89	26.25	
	Mechanical Works	14.24	17.52	14.89	
	Maintenance expenses (% in total capital)			2%	
	Maintenance dredging per year			0.02	

Table A40.12 Economic Analysis (Hanoi Segment - 2010)

Year	Calendar Year	Forecast		Capital Investment					Maintenance Cost				Cost		Benefit		Discounted Value		
		Cargo Volume	Million Tons	River Training	Navigation Channel	Port Works (4 Ports)	Port Works (OPG)	Machinery	Sub-Total	Civil Works Portion	Machinery	Fairway	Sub-Total	Total	Total	Net Benefit	Cost 10 % D.R.	Benefit 10 % D.R.	Net Present Value
		US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million	US\$ Million
	2007		23.2					23.2						23.2		-23.2	23.20		-23.20
	2008		23.2			13.1	7.8	44.2						44.2		-44.2	40.14		-40.14
	2009		23.2	9.2	13.1	7.8	23.8	77.1						77.1		-77.1	63.74		-63.74
1	2010	10.51						0.0	0.56	0.48	0.48	1.51	1.5	19.1	17.6	1.14	14.38	13.24	
2	2011	11.03						0.0	0.56	0.48	0.48	1.51	1.5	20.1	18.6	1.03	13.72	12.69	
3	2012	11.58						0.0	0.56	0.48	0.48	1.51	1.5	21.1	19.6	0.94	13.09	12.15	
4	2013	12.16						0.0	0.56	0.48	0.48	1.51	1.5	22.1	20.6	0.85	12.50	11.64	
5	2014	12.76						0.0	0.56	0.48	0.48	1.51	1.5	23.2	21.7	0.78	11.93	11.15	
6	2015	13.40						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.71	11.38	10.68	
7	2016	14.06						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.64	10.35	9.71	
8	2017	14.77						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.58	9.41	8.82	
9	2018	15.51						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.53	8.55	8.02	
10	2019	16.29						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.48	7.77	7.29	
11	2020	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.44	7.07	6.63	
12	2021	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.40	6.43	6.03	
13	2022	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.36	5.84	5.48	
14	2023	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.33	5.31	4.98	
15	2024	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.30	4.83	4.53	
16	2025	17.10					23.8	23.8	0.56	0.48	0.48	1.51	25.3	24.4	-0.9	4.55	4.39	-0.16	
17	2026	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.25	3.99	3.74	
18	2027	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.22	3.63	3.40	
19	2028	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.20	3.30	3.09	
20	2029	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.19	3.00	2.81	
21	2030	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.17	2.72	2.56	
22	2031	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.15	2.48	2.32	
23	2032	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.14	2.25	2.11	
24	2033	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.13	2.05	1.92	
25	2034	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.12	1.86	1.75	
26	2035	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.10	1.69	1.59	
27	2036	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.10	1.54	1.44	
28	2037	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.09	1.40	1.31	
29	2038	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.08	1.27	1.19	
30	2039	17.10						0.0	0.56	0.48	0.48	1.51	1.5	24.4	22.9	0.07	1.16	1.08	
	Total	474.1	69.6	9.2	26.3	15.7	47.6	168.3	16.7	14.3	14.4	45.4	213.7	715.7	502.0	143.1	179.3	36.1	

Note)

- 1 Initial capital investment for channel stabilization works (Phase-I) US\$ 81.9 million (Financial Price)
- Initial capital investment for Navigation Channel (Phase-I) US\$ 10.8 million (Financial Price)
- Total Investment Amount for Channel Project US\$ 92.7 million (Financial Price)
- 2 Initial capital investment for channel stabilization works (Phase-I) US\$ 69.6 million (Economic Price)
- Initial capital investment for Navigation Channel (Phase-I) US\$ 9.2 million (Economic Price)
- Total Investment Amount for Channel Project US\$ 78.8 million (Economic Price)
- 3 Total Civil Works for Port Facility (for 4 Ports) US\$ 26.3 million (Economic Price)
- Total Machinery for Cargo Handling Operation (for 4 ports) US\$ 14.9 million (Economic Price)
- 4 Total Cargo Handling Volume by 4 Ports 4.4 Million Tons
- 5 Total Cargo Handling Volume in Hanoi Segment 10.5 Million Tons
- 6 Total Civil Works for Port Facility (for Other Port Group) US\$ 15.7 million (Economic Price)
- Total Machinery for Cargo Handling Operation (for Other Port Group) US\$ 8.9 million (Economic Price)
- 7 Adjustment Ratio 25.0 %
- 8 Maintenance Dredging Cost for Channel US\$ 0.48 million per year
- Maintenance cost for civil works portion 0.5%
- Maintenance cost for machinery portion 2.0%

Economic Analysis Indicator		
Project Life	Years	40
EIRR		12.93%
NPV at	10%	36.12
B/C Ratio at	10%	1.25