APPENDICES

APPENDICES

A.1 Scope of Environmental Surveys

The following additional environmental surveys were conducted to collect additional information required for the study and predictions of sediment dispersion behavior.

1) Ecological survey in the reclamation area (benthos, marine biology)
2) Ecological survey in the borrow area (terrestrial plant and animal)
3) Offshore ecological survey in the dredging area (tidal current, water quality, seabed material, benthos)
4) Offshore ecological survey in the dumping area (water quality, seabed material, benthos)
5) Fishery activity survey
6) Present condition survey (water quality, seabed material, benthos)
7) Air quality observation
8) Water quality for future monitoring purpose (water quality)

Figure A.1 Shows the location of survey stations

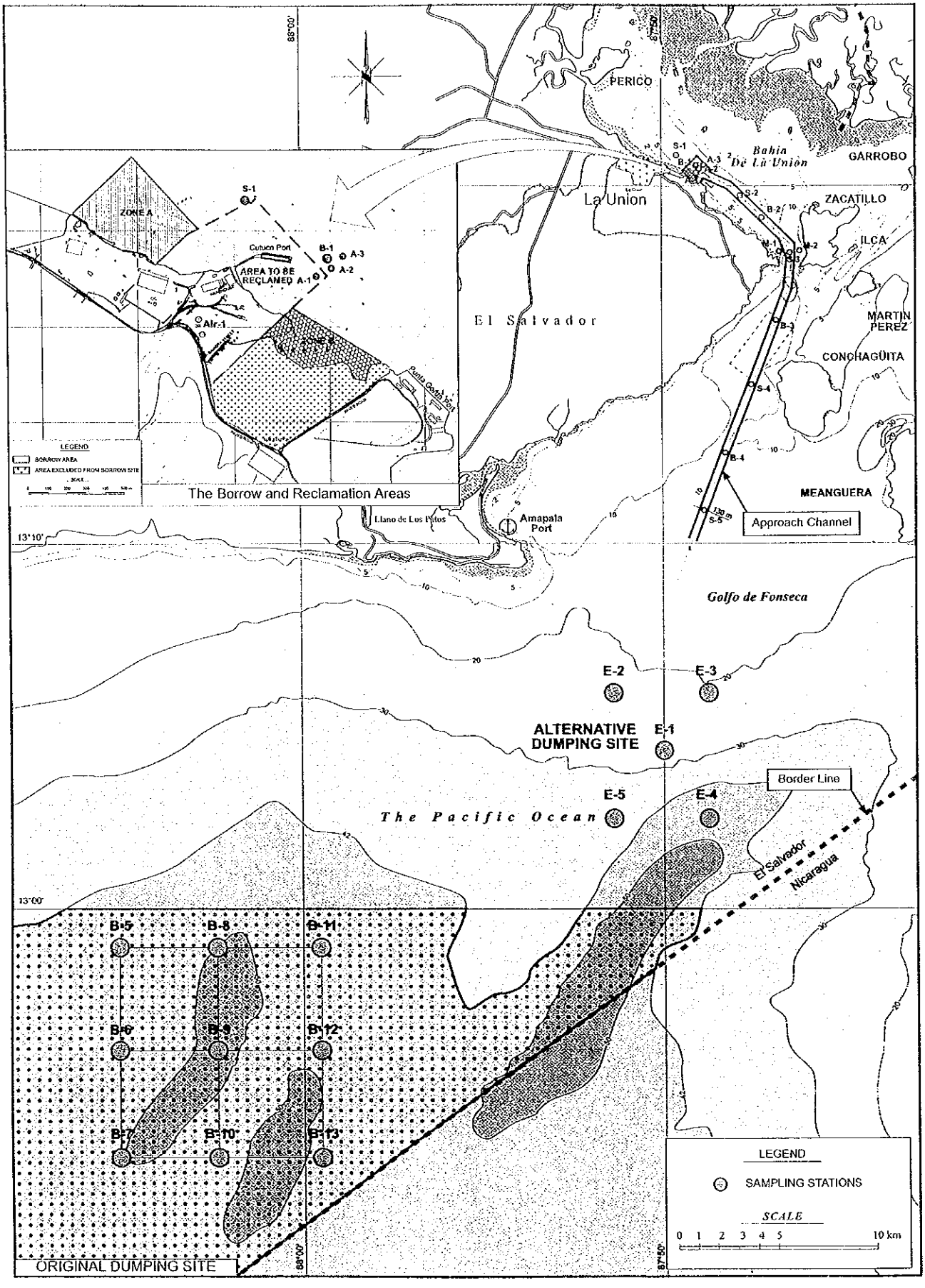

Figure A.1 Shows the Locations of Surveys Stations

B.1 Ecology Survey of Sunken Rocks

Table B.1 Structure of Biotic in Marine Area, Rock and Sand (50 meters by sampling station) in North Area from "Cutuco" Dock, La Unión Bay, Fonseca Gulf of December 2001

STATION	BIOTIC COBERTURE (%)	ROCK (%)	SAND (%)	SPECIES (Quantity)	DIVERSITY (H)	EQUITATIVITY (J)
1	10.8	15.2	74	13	1.59	0.62
2	15.8	32	52.2	10	1.63	0.71
3	22.6	42.4	35	9	1.64	0.74
4	15.8	27.2	57	10	1.78	0.77
5	18.4	28	53.6	12	1.76	0.71
6	16.6	30	53.4	12	1.77	0.71
X +/- S		29.1 +/-8.8	54.2 +/- 12.4			
TOTAL SPECIES FOUNDED						

Table B.2 Total Coberture by Biotic Species on each Sampling Station

SPECIE	STATION						Summary	Density (Ind/m2)	Percentage (%)
	1	2	3	4	5	6			
Nerita sp "caracol negro"	29	207	274	89	190	150	939	9.39	13.5
Ostrea iridescens "ostra"	24	48	143	130	107	95	547	5.47	7.8
Bostrychyia moritziana "alga filamentosa"			6	5	7	6	24	0.24	0.32
Bostrychyia sp "alga costrosa"	8			10		9	27	0.27	0.4
Cladophora "alga mechuda"	11	1			3		15	0.15	0.2
Polimesoda solida "miona o almeja"	5	21	51	30	35	39	181	1.81	2.6
"esponja amarilla"	10				8		18	0.18	0.3
"esponja blanca"	10					5	15	0.15	0.2
Balanus sp. "cirriperidos o bromas"	404	465	614	360	480	460	2783	27.83	40
Chiton stokesii "quitón"	1				2		3	0.03	0.04
Cerithidea sp. "caracolillos"	48	126	90	105	110	95	574	5.74	8.2
"tubos de poliquetos"	84	172	348	300	275	226	1405	14.05	20.1
Mytella guyanensis "churria o mejillón"	110	51	43	45	52	60	361	3.61	5.2
Clibanarius panamensis "cangrejo ermitaño"	10	11	5	25	15	13	79	0.79	1.1
Nudy branchia "babosa marina"		1				2	3	0.03	0.04
SUMMARY	754	1103	1574	1099	1284	1160	6974		100
PERCENTAGE	10.8	15.8	22.6	15.8	18.4	16.6			100

Table B.3 Importance Value Index (IVI) Considering Coberture of Biota, Rock and Sand on Six Sampling Stations

SPECIES	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY	ABSOLUTE DENSITY	RELATIVE DENSITY	ABSOLUTE COBERTURE	RELATIVE COBERTURE	I V I
Nerita sp "caracol negro"	153	8.16	6.14	4.26	939	2.89	15.31
Ostrea iridescens "ostra" (oister)	108	5.76	5.06	3.51	547	1.68	10.95
Bostrychyia moritziana "alga filamentosa"	6	0.32	4	2.78	24	0.07	3.17
Bostrychyia sp "alga costrosa"	5	0.27	5.4	3.75	27	0.08	4.1
Cladophora "alga mechuda"	7	0.37	2.14	1.49	15	0.06	1.91
Polimesoda solida "miona o almeja"	79	4.21	2.29	1.59	181	0.56	6.36
"esponja amarilla"	3	0.16	6	4.17	18	0.05	4.38
"esponja blanca"	2	0.11	7.5	5.21	15	0.05	5.4
ROCA	323	17.23	28.12	19.53	9084	27.9	64.66
ARENA	330	17.6	49.83	34.6	16446	50.6	102.8
Balanus sp. "cirriperidos o bromas"	268	14.29	10.38	7.21	2783	8.56	30.06
Chiton stokesii "quitón"	2	0.11	1.5	1.04	3	0.01	1.16
Cerithidea sp. "caracolillos"	160	8.53	3.59	2.49	574	1.77	12.79
"tubos de poliquetos"	258	13.76	5.45	3.78	1405	4.33	21.86
Mytella guyanensis "churria o mejillón"	139	7.41	2.6	1.81	361	1.11	10.36
Clibanarius panamensis "cangrejo ermitaño" (crab).	30	1.6	2.5	1.74	75	0.27	3.57
Nudy branchia "babosa marina"	2	0.11	1.5	1.04	3	0.01	1.16
SUMMARY	1875	100	144	100	32500	100	300

Table B.4 Comparison of Biotic Community Structure between South and North Side of Dock

STRUCTURAL CARACTERISTIC	NORTH SIDE	%	SOUTH SIDE
DOMINANT COVERTURE (%)	SAND: 54		SAND: 38
	ROCK: 29		ROCK: 58
SPECIES QUANTITY	15		16
PRIORITY SPECIES DENSITY (ind/m2)			
a) Balanus sp "bromas"	28		33
b) Tubos de poliquetos	14		5.5
c) Cirithidea sp "caracolillos"	5.7		5.3
d) Nerita sp. "caracol negro"	9.39		6. 1
e) Ostrea iridescens "ostra"	5.5		20
DIVERSITY (H´)	1.59 TO 1.78		0.6 TO 1.6
EQUITATIVITY (J´)	0.62 TO 0.77		0.38 TO 0.99
SIMILARITY INDEX IN BOTH AREAS (%)			
a) Coverture		84	
b) Precense or absence of species		84	

C.1 Inland Ecology Survey

Table C.1 Trees and Shrubs Identified by Ecological Survey for Borrow Site

FAMILY	SCIENTIFIC NAME	LOCAL COMMON NAME	ENGLISH NAME
Leguminosae	*Enterolobium cyclocarpum*	Conacaste negro	Guanacaste tree
	*Pithecelobium oblongum**	Mangollano	N/A
	Pithecelobium saman	Zorra	Monkey pod
	Mimosa farnesiana	Espino blanco	Sweet Acacia or Koa
	Caesaria racemosa	Nacascol	N/A
	*Piptadenia constricta**	Pintadillo	N/A
	*Albizzia caribeae**	Conacaste blanco	Caribean pine
	Gliricidia sepium	Madrecacao	mother of cacao
	Mimosa pigra	Zarza	catclaw mimosa
	Delonix regia	Flor de fuego	flame tree
	Acacia cornigera	Iscanal	Bull-horn Acacia
	Andira inermis	Almendro de río	Cabbage Tree
	Bauhinia ungulata	Casco de venado	Orchid Tree
	*Lysiloma divaricatum**	Quebracho	N/A
	Cassia grandis	Carao	N/A
	Lonchocarpus minimiflorus	Cincho	N/A
	Tamarindus indica	Tamarindo	Tamarind Tree
	Hymenaea coubaril	Copinol	Red locus or Jatoba
	Crotalaria vitulina	Chipilín montés	N/A
Borraginaceae	*Cordia dentata*	Tiguilote	N/A
Combretaceae	*Combretum farinosus*	Chupamiel	Wild bindweed
	*Conocarpus erectus**	Botoncillo	Buttonnwood
	*Laguncularia racemosa**	Sincahuite – Mangle Blanco	White Mangrove
Burseraceae	*Bursera simaruba*	Palo jiote	Gumbo limbo
Sterculiaceae	*Sterculia apetala*	Caulote	French Peanut
Bignoniaceae	*Tabebuia rosea*	Maquilishuat	Pink Tecoma
	*Crescentia cujete**	Jícaro	Calabash Tree
	Crescentia alata	Morro	Calabash Tree
Polygonaceae	*Coccoloba floribunda**	Iril	N/A
	*Swietenia humilis**	Caobo	Pacific Coast Mahogany
	*Cedrela odorata**	Cedar	Spanish Cedar
	*Trichilia martiana**	Cola de pava	N/A
Simaroubaceae	*Simaruba glauca*	Arbol de Olivas	Olive Tree
Apocynaceae	*Stemmadenia molli*	Cojón	N/A
	Stemmadenia donnell-smithii	Cojón de puerco	Horse balls
	Plumeria rubra	Flor de mayo	Plumeria or Franginapi

FAMILY	SCIENTIFIC NAME	LOCAL COMMON NAME	ENGLISH NAME
	Plumeria acutifolia	Flor de ensarta	Temple Tree
Cochlospermaceae	*Cochlospermum vitifolium*	Tecomasuche	Single Flower Buttercup
Moraceae	*Cecropia peltata*	Guarumo	Trumpet Tree
	*Ficus glabrata**	Amate	Small leaved Fig
Rutaceae	*Murraya paniculata*	Myrtle or Mirto	Orange Jasmin
	Citrus aurantifolia	Limon	Lemon
	Citrus medica	Grapefruit	Grapefruit
	Citrus lima	Naranja lima	Lime
Anacardiaceae	*Spondias purpurea*	Jocote de verano	Red Plum
	Mangifera indica	Mango	Mango
Araliaceae	*Polyscia sp*	Encaje	Cortón
Casuarinaceae	*Casuarina equisetifolia*	Casuarina	Australian Pine
Malvaceae	*Hibiscus rosa-sinensis*	Clavelón	Hibiscus
Rubiaceae	*Gardenia jasminioides*	Jazmín del cabo	Gardenia
	Randia armata	Crucito	N/A
	*Calycophyllum candidissimum**	Salamo	Guatagire
Arecaceae	*Erythea salvadorensis**	Palma de sombrero	Palm Tree
Bombacaceae	*Ceiba pentandra**	Ceiba	Silk Cotton Tree or Kapok
Euphorbiaceae	*Jathropa curcas*	Tempate	Nettlespurge
	Ricinus communis	Higuerillo	Castrobean
	*Alchornea Latifolia**	Tambor	N/A
Annonaceae	*Annoma palustris*	Anona bayunca	Silly Sweet Sop
Verbenaceae	*Gmelina arborea*	Melina	Yemane
	Tectona grandis	Teca	Teak
	*Avicennia germinans**	Madresal	Black Mangrove
Malpighiaceae	*Mascagnia ovatiforme*	Nance verde	Golden Spoon
Capparidaceae	*Crataeva tapia**	Cachimbo	Garlic Pear
	Capparis indica	Curumo	Caper
Ulmaceae	*Karwinskia calderonii**	Huiliguishte	N/A
Cactaceae	*Opuntia salvadorensis*	Nopla	Prickly Pear
Solanaceae	*Solanum hayesii*	Friega platos	N/A
Asclepiadaceae	*Calotropis gigantean*	Huisquil de playa	Milk Weed or Swallot-Wost
Myrtaceae	*Psidium guajava*	Guayabo	Common Guava
Caricaceae	*Carica cauliflora**	Molocote	Nam-nam
Rhizophoraceae	*Rhizophora mangle**	Mangle Colorado	Red Mangrove
Piperaceae	*Piper tuberculatum*	Cordoncillo	Candle Bus
	Piper aurantium	Santa María	Root Beer Plant

Note: * It means nationally rare

Table C.2 Herbaceous Flora Identified by Ecological Survey for Borrow Site

FAMILY	SCIENTIFIC NAME	LOCAL COMMON NAME	ENGLISH NAME
Rubiaceae	*Hamelia patens*	Sisipince	Firebush
Verbenaceae	*Lantana camara*	Cinco negritos	Hummingbird flower
Sapindaceae	*Paullinia pinnata*	Nixtamal	Fruiting vine
Malvaceae	*Sida acuta*	Escobilla	Spinyhead sida
Solanaceae	*Capsicum bacatum*	Chiltepe	Wild Pepper
Acanthaceae	*Blechum brownie*	Corredora	Green Shrimp Plant
	Justicia carthaginensis	Sacatinta	Lavender Justicia
Loasaceae	*Gronovia scandens*	Pan caliente	N/A
Cucurbitaceae	*Luffa acutangula*	Paste	Vegetable Sponge
	Cayaponia racemosa	Sandía de culebra	N/A
	Elaterium ciliatum	Tunquito	Elaterium
Oxalidaceae	*Oxalis nei*	Agrillo	N/A
Convolvulaceae	*Ipomoea spp*	Campanilla	Morning Glory
Sterculiaceae	*Waltheria americana*	Escobilla de buey	Sleepy Morning
Tiliaceae	*Triunfetta lappula*	Mozote de caballo	Grandcousin
Graminaceae	*Cenchrus brownii*	Mozote	Burgrass
	Cenchrus echinatus	Mozote de playa	Burgrass
	Pennisetum setosum	Gusano	Fountain Grass
	Paspalum fasciculatum	Camalote	Banboo Grass
	Ixophorus unisetus	Zacate de agua	Honduras Grass
	Hypharrennia ruffa	Zacate illusion	N/A
	Paspalum notatum	Grama negra	Bahiagrass
	Nassella pubiflora	Plumilla	N/A
	Cynodon dactylon	Barrenillo	Bermuda Grass
Cyperanceae	*Cyperus spp*	Coyolillo	Nut sedge or Nutgrass
Phytolaceae	*Petiveria alliacea*	Epacina	Anamu
Compositae	*Baltimora recta*	Flor amarilla	N/A
	Melanthera nivea	Botoncillo	White Melanthera
	Elephantopus spicatus	Oreja de chucho	N/A
Passifloraceae	*Passiflora coriaceae*	Ala de muerciélago	Bat Leaf Pasión Flower
Asclepiadaceae	*Asclepias longicornis*	Matacoyote	Milkweed
Amaranthaceae	*Gomphrena globosa*	Borla	Globe Amaranth
Lamiaceae	*Hyptis capitata*	Chichinguaste	Buttonweed
Leguminosae	*Senna occidentalis*	Frijolillo	Coffe Senna or Coffeweed
Capparidaceae	*Cleome spinosa*	Alhelí	Spring Spider-Flower
Apocynaceae	*Rauwolfia tetraphylla*	Amatillo	Rauwolfia

Table C.3 Reptiles and Aquatic Fauna Identified by Ecological Survey for Borrow Site

SCIENTIFIC LATIN NAME	LOCAL COMMON NAME	ENGLISH COMMON NAME	MAG(*) 1998
Kinosternum scorpioides	Tortuga candado	Scorpion mud turtle	T
Rhinoclemys scorpioides	Tortuga coralio	Central America turtle	
Iguana iguana	Iguana verde	Green iguana	DE
Ctenosaura similes	Garrobo	Spiny-tailed iguana	
Norops sp	Bebeleche	Anole	
Ameiva undulata	Lagartija	Whiptailed lizard	
Basiliscus vittatus	Tenguereche	Common grown basilisk	
Boa Constrictor	Masacuata	Boa Constrictor	T
Oxybelis aeneus	Bejuquilla cafe	Mexican vine snake	T
Lampropeltis triangulum	False coral	Milk snake	DE
Micrurus nigrocinctus zunilensis	Coral	Central American Coral Snake	T
Masticophis mentovarius	Zumbadora	Neotropical whipsnake	
Crotalus durissus	Cascabel	Rattlesnake	DE

Note (*): (T = Threatened, DE = in Danger of Extinction) classified according to the guidelines established by MAG)

Table C.4 Birds Identified by Ecological Survey for Borrow site

SCIENTIFIC LATIN NAME	LOCAL COMMON NAME	ENGLISH COMMON NAME	MAG? 1998
Pelecanus erythrorhynchus	Pelicano blanco	American white pelican	T
Pelecanus occidentalis	Pelicano	Brown pelican	
Fregata magnificens	Fragatas	Magnificent frigatebird	
Dendrocygna autumnalis	Pichiche	Black bellied whistling-duck	
Coragyps atratus	Zope	Black vulture	
Cathartes aura	Zope de cabeza roja	Turkey vulture	
Falco sparverius	Lilisque	Sparrow kestrel	T
Caracara plancus	Querque	Southern caracara	T
Ortalis leucogastra	Chachalaca	White bellied chachalaca	T
Colinus leucopogon	Codorníz	Spot-bellied bobwhite	
Charadrius semipalmatus	Chorlito	Semipalmated plover	
Actitis macularia	Alzacoleta	Spotted sandpiper	
Numenius phaeopus	Chorlito	Whimbrel	
Larus atricilla	Gaviota	Laughing gull	
Sterna maxim	Gaviota	Maxim tern	
Asian zenaida	Paloma Blanca	White wing dove	
Leptotila verreaxi	Rodadora	White tipped dove	
Columbine talpacoti	Tortolita rojiza	Ruddy ground-dove	
Columba livia	Paloma de Castilla	Pigeon, rock dove	
Columbine inca	Tortolita	Incadove	
Arantinga strenua	Pericón	Pacific Parakeet	T
Aratinga canicularis	Chocoyo	Orange fronted parakeet	T
Brotegeris yugularis	Catalnica	Red neck parapkeet	
Amazon auropaliata	Lora de nuca amarilla	Yellow headed parrot	DE
Crotophaga sulcirostris	Pijuyo	Groove-billed ani	
Piayua cayana	Roasted bananas	Squirrel cuckoo	
Glaucidium brasilianum	Aurora	Ferruginous Pygmy-owl	
Amazilia twinkles	Colibri	Hummingbird	
Eumomota superciliosa	Torogoz	Turquoie-browned motmot	
Momota momota	Talapo	Blue-crowned motmot	
Melanerpes aurifrons	Cheje	Golden-fronted woodpecker	
Contopus cinreus	Copetón	Tropical pewee	T

SCIENTIFIC LATIN NAME	LOCAL COMMON NAME	ENGLISH COMMON NAME	MAG(*) 1998
Pitangus sulphuratus	Cristo fue	Great kiskadee	
Progne chalybea	Golondrina Gris	Grey breasted martin	
Hirundo rustica	Golondrina	Barn swallow	
Calocitta Formosa	Magpie	White-throated magpie-jay	
Campylorhynchus rufinucha	Guacalchía	Rufous-naped wren	
Turdus grayi	Chonte	Clay colored robin	
Vermivora peregrina	Chipe	Tennessee warbler	
Dendroica petechia erythacorides	Reinita del manglar	Yellow warbler	T
Icterus g. galbula	Chiltota	Baltimore oriole	
Icterus gularis	Chiltota	Altamira Oriole	
Quiscalus mexicanus	Clarinero	Great-Tailed grackle	

Note (*): (T = Threatened, DE = in Danger of Extinction) classified according to the guidelines established by MAG

Table C.5 Mammals Identified by Ecological Survey for Borrow Site

SCIENTIFIC LATIN NAME	LOCAL COMMON NAME	ENGLISH COMMON NAME	MAG'' 1998
Didelphys marsupialis	Tacuazin	Opossums	
Dasypus novemcinctus fanestratus	Cuzuco	Nine banded armadillo	T
Mephitis macroura	Zorrillo	Hooded Skunk	
Canis Latrans dickeyi	Coyote	Coyote	T
Agouti paca	Tepezcuintle	Paca Agouti	DE
Sylvilagus floridanus	Conejo salvaje	Eastern cottontail rabbit	
Procyon lotor	Mapache	Raccoon	
Herpailurus yagouaroundi fassata	Gato zonto	Otter cat	DE
Sciurus variegatoides	Ardillas	Squirrel	
Nyctamys sp	Ratón	Mouse	
Rattus rattus	Rata	Wild rat	

Note (*): (T = Threatened, DE = in Danger of Extinction) classified according to the guidelines established by MAG

D.1 Air Quality Survey

Table D.1 24 Hour Monitoring Results

CONCENTRATION 24 HOURS		WORLD BANK GUIDE		USEPA GUIDE		EL SALVADOR NORMATIVE	
(mg/m3)			%		%		%
RAINY SEASON							
PM10 (dust)	4.6	110	4	150	3	150	3
SO2	< 13	125	10	165	8	365	4
NO2	< 9	150	6	ND		150	6
DRY SEASON							
PM10 (dust)	21.1	110	19	150	14	150	14
SO2	< 13	125	10	165	8	365	4
NO2	< 9	150	6	ND		150	6

E.1 Water Quality Survey

Table E.1 Quality of Surface Water along Proposed Approach Channel in September and December 2001
(Temperature, ph and Salinity)

	Temperature °C (Sep)	Temperature °C (Dec)	Ph (Sep)	pH (Dec)	Salinity 0/00 (Sep)	Salinity 0/00 (Dec)
A-1	33.0	28.0	8.0	8.5	30	29
A-2	33.0	28.0	8.0	8.5	30	29
A-3	33.0	28.0	2.9	8.4	30	29
B-2	33.0	30.0	7.9	8.4	30	31
B-3	32.0	30.0	7.9	8.1	31	31
B-4	32.1	31.0	7.9	8.2	32	30
M-1	33.0	30.0	7.9	8.3	30	30
M-2	32.8	30.0	8.0	8.3	30	30
S-1	33.0	28.0	7.9	8.5	30	29
S-2	33.0	30.0	8.0	8.4	30	31
S-3	32.0	30.0	7.8	8.2	30	30
S-4	32.1	30.0	7.9	8.4	33	30
S-5	31.1	30.0	8.0	8.2	33	32
B-5	31.0		8.1		33	
B-6	31.0	31.0	8.1	8.1	34	34
B-7	31.0		8.2		33	
B-8	31.0		8.1		33	
B-9	33.0	33.0	8.2	8.2	35	35
B-10	32.0		8.2		33	
B-11	31.0		8.2		35	
B-12	32.0	32.0	8.2	8.2	33	33
B-13	32.0		8.2		33	
E-1		31.0		7.8		33
E-2		30.0		7.9		33
E-3		30.0		7.9		33
E-4		30.0		7.9		33
E-5		30.0		7.9		33

Table E.2 Quality of Surface Water along Proposed Approach Channel in September and December 2001 (Transparency, turbidity and suspended solids).

	Transparency m (Sep)	Transparency m (Dec)	Turbidity NTU (Sep)	Turbidity NTU (Dec)	Suspended Solids mg/ltr (sep)	Suspended Solids mg/ltr (sep)
A-1	0.71	0.96	2.2	1.4	186.5	195.5
A-2	0.77	0.98	2.5	1.8	199.5	198
A-3	0.82	0.95	2.0	1.6	170.5	202
B-2	0.83	0.63	2.0	1.3	193	218
B-3	0.97	0.8	1.8	1	195.5	206
B-4	1.05	0.85	1.6	1.4	202.5	200.5
M-1	0.80	0.92	2.1	2.3	193	213.5
M-2	0.93	0.82	1.9	2.3	173.5	215
S-1	0.77	0.96	2.6	3	402	207.5
S-2	0.97	0.8	2.3	1.6	196.5	203
S-3	0.89	0.8	2.2	1.1	213.5	200.5
S-4	0.96	1.14	2.2	1.5	190	215
S-5	1.43	0.82	1.4	1.6	379	210.5
B-5	12.45		0.4		181.5	
B-6	14.34	14.34	0.3	0.3	181	181
B-7	14.8		1.5		189.5	
B-8	13.75		0.4		186.5	
B-9	15.72	15.72	0.2	0.3	186.5	186.5
B-10	18.2		0.2		184.5	
B-11	14.84		0.2		180.5	
B-12	13.9	13.9	0.3	0.4	177	177
B-13	19.8		0.2		173.5	
E-1		8.5		0.5		176.5
E-2		8.5		0.4		166
E-3		8.5		0.3		176.5
E-4		8.5		0.3		170
E-5		8.5		0.3		169

Table E.3 Quality of Surface Water along Proposed Approach Channel in September and December 2001 (Chemical Oxygen Demand, and Total Oil and Grease)

	Total Oil mg/ltr (Sep)	Total Oil mg/ltr (Dec)	COD mg/ltr (Sep)	COD mg/ltr (Dec)
A-1	31.30	23.5	86.1	111.8
A-2	19.30	17	90.7	198.8
A-3	14.30	18.3	104.3	111.8
B-2	9.50	0	132.6	0
B-3	2.30	0	204.0	0
B-4	0	0	182.4	0
M-1	0	0	0	0
M-2	0	0	0	0
S-1	0	0	56.7	0
S-2	0	0	70.3	0
S-3	1.00	0	66.9	0
S-4	0.50	0	77.1	0
S-5	1.00	0	119.0	0
B-5	0		102	
B-6	0	0	98.6	98.6
B-7	0		60.1	
B-8	0		65.7	
B-9	0	0	79.3	79.3
B-10	4.25		65.7	
B-11	13.8		66.9	
B-12	13.5	13.5	58.6	58. 6
B-13	8		53.3	
E-1		5.5		242.2
E-2		10.8		285.7
E-3		12.5		173.9
E-4		17.5		62.1
E-5		9		211.2

F.1 Seabed Quality Survey

Table F.1 Granulometry in Alternate Deposition Area

	FINE SAND (%)	SILT (%)	CLAY (%)
Station E-1	63.4	22.6	14
Station E-2	60.9	25.1	14
Station E-3	66.2	20.3	13.5
Station E-4	66.6	18.4	15
Station E-5	59.6	25.4	15

Table F.2 Loss on Ignition Results, Front of Wharf, Rainy Season

STATION	ASH	VOLATILE MATERIAL
A-1	89.57 %	10.43 %
A-2	89.65 %	10.35 %
A-3	94.27 %	5.73 %

Table F.3 Loss on Ignition Results, Front of Wharf, Dry Season

STATION	ASH	VOLATILE MATERIAL
A-1	85.86 %	14.14 %
A-2	92.50 %	7.50 %
A-3	86.89 %	13.11 %

Table F.4 Loss on Ignition Results Alternative Deposition Area, Dry Season

STATION	ASH	VOLATILE MATERIAL
E-5	89.38 %	10.62 %
E-4	89.57 %	10.43 %
E-3	90.74 %	9.26 %
E-2	90.74 %	9.26 %
E-1	91.96 %	8.04 %

Table F.5 Total Oil and Grease

	Total Oil mg/ltr (Oct)	Total Oil mg/ltr (Dec)	Remarks
A-1	-	0.0	
A-2	0.0	20.0	
A-3	-	0.0	
B-2	0.0	-	
B-3	0.0	-	
B-4	0.0	-	
S-1	0.0	-	
S-2	0.0	-	
S-3	0.0	-	
S-4	0.0	-	
S-5	0.0	-	
E-1	-	65.0	
E-2	-	20.0	
E-3	-	5.0	
E-4	-	0.0	
E-5	-	0.0	

G.1 Seabed Benthic Organism Survey

Table G.1 Density in Rainy Season

Species	Stations																					Density/Total Species
	B-2	B-3	B-4	S-1	S-2	S-3	S-4	S-5	A-1	A-2	A-3	M-1	M-2	B-5	B-6	B-7	B-8	B-9	B-10	B-11	B-13	B-13	
Acesta lopezi lopezi	171	29		71		229		143			200	86	114										1043
Americonuphis sp														14	14	29	43	14		14	14		142
Amphiodia oerstedi						57	57	43				29	100										286
Anadara grandis	14		29			86						114	143										386
Ancistrosyllis ocellata	29								57	14	14	57	86										257
Aratus sp.	29	57	57			71			86	14			14										328
Armandia salvadoriana			71		100	171	71	57	57	143	157												827
Callinectes toxotes														14	29	14	14	29		29	14		143
Capitella capitata			57	71	86		14		29	114	86	29											486
Cerithidea sp														14		29			14	14		57	128
Chone minuta			171	86	57	114	214		71		100												813
Dasybranchus lumbricoides				71		100		43			43												257
Diopatra ornata					71		71			71	14	57		43	57		14	14		14	14		440
Eteone estuarina				29						14													43
Eunoe sp1						71						14	57										142
Glycinda paucignatha		43		43			43					43		71									243
Haploscolopos elongatus		29			29				14				57										129
Laeoneris uncinigera			57			57		29	100		114		71										428
Magelona pacifica	29					43																	72
Magelona sp	14				57			71		57	71		71										341
Menipe frontalis												114	29										143
Mytella guyanensis				86	114				57	14	14												285

Table G.2 Density in Rainy Season

SPECIES	STATIONS																					DENSITY TOTAL SPECIES
	B-2	B-3	B-4	S-1	S-2	S-3	S-4	S-5	A-1	A-2	A-3	M-1	M-2	B-8	B-6	B-7	B-8	B-9	B-10	B-11	B-12	B-13	
Nephtys oculata				29					114						57								200
Nerita sp	43		14	114					86	57	29												343
Opisthosyllis arboricora							57																57
Pachygrapsus transversus		71		86			86																243
Paraprionopio pinnata	171		100		129			71		171	29			43									714
Penaeus californiensis	29	29			29		57		86			57		57			14			14			372
Penaeus stylirostris						57								86			11 4			29			286
Penaeus vannamei		14	29	29		14		100			43		71	29									329
Pinnixa valeril	43		71		14																		128
Portunus sp																14			29			14	57
Protothaca sp														14		14	43		14	29		14	128
Renilla sp						43						57	114										214
Sipunculus nudus	57	29	71																				157
Sipunculus phalloides		43		86		29	129					29	57										373
Telina sp1	14				57	14			14	114	14	14	57										298
Telina sp2		43				100						29	14										186
Uca beebei		57		71			71		71	57	14												341
Uca limicola	57		71	86		14						43	14										285
DENSITY/STATION	700	444	795	958	743	1270	870	557	842	846	942	772	1069	385	157	100	24 2	57	57	143	42	85	
DIVERSITY (H')	2.2	2.3	2.3	2.6	2.3	2.6	2.2	2	2.4	2.2	2.3	2.5	2.6	2.1	1.3	1.6	1.5	1	1	1.9	1.1	0.9	
EQUITATIVITY (J')	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	1	0.7	

Table G.3 Density in Dry Season

Species	Total Density			
	A-1	A-2	A-3	By Species
Acesta lopezi lopezi		43	86	**129**
Armandia salvadoriana	71	171	214	**456**
Ancistrosyllis ocellata	29			**29**
Chone minute	200	114	171	**485**
Capitella capitata	886	229	486	**1601**
Dasybranchus lumbricoides		29	14	**43**
Laeoneris uncinigera	29		71	**100**
Diopatra ornata			14	**14**
Magelona sp	29			**29**
Glycinda paucignatha		14		**14**
Nephtys oculate			57	**57**
Paraprionospio pinnata		29		**29**
Sipunculus nudus		29	14	**43**
Sipunculus phalloides	29		43	**72**
Telina sp1		29	14	**43**
Telina sp2	14			**14**
Aratus sp.			29	**29**
Pinnixa valerii		71	14	**85**
Uca beebei	29	14	29	**72**
Uca limicola		29		**29**
Eteone estuarina	71	14	29	**114**
Mytella guyanensis	29	86	57	**172**
DENSITY/STATION	**1416**	**901**	**1342**	
DIVERSITY (H')	**1.4**	**2.2**	**2.1**	
EQUITATIVITY (J')	**0.6**	**0.8**	**0.7**	

Table G.4 Density in Dry Season (Additional Stations)

Species	Center	North East	North West	South East	South West	Total Density By Species
Eurysquilla veleronis	14	14			14	**42**
Protothaca sp	29	43			29	**101**
Cerithidea sp	29	14	14			**57**
Penaeus vannamei		14		29		**43**
Penaeus californiensis	14	14	29	29	14	**100**
Penaeus stylirostris	29	57	29	43	29	**187**
Paraprionopio pinnata	171	214	114	329	229	**1057**
Eunoe sp. 1	14	86	29	14	43	**186**
Diopatra ornata	71	43	29	29	43	**215**
Americonuphis sp		29		14	14	**57**
Density/Station	**371**	**528**	**244**	**487**	**415**	
Diversity (H')	**1.6**	**1.9**	**1.5**	**1.2**	**1.5**	
Equitativity (J')	**0.7**	**0.8**	**0.8**	**0.6**	**0.7**	

Table G.5 List of Marine Benthos Recorded in Vicinity of Cutuco Port

Taxonomic Group	Scientific Name
Algae (seaweed)	Bostrychyia moritziana
	Bostrychyia sp
	Cladophora sp
Segmented worms	Serpulid polychaete
Gastropod molluscs-snails	Nerita sp
	Cerithidea sp
Bivalve molluscs-clams	Ostrea iridescens
	Mytella guyanensis
	Polimesoda solida
Crustacea – chitons	Chiton stokesii
Crustacea – barnacles	Balanus sp
Crustacea - crabs	Menipe frontalis
	Grapsid crab
Crustacea – hermit crabs	Clibanarius panamensis
Sponges	Red sponge
	Yellow sponge
	White sponge

H.1 Fishery Survey

Table H.1 Annual Volume of El Salvador Fish Catch (metric tons) Between 1991 and 2000

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Industrial Fishing	2,013	2,821	4,012	4,228	4,910	6,391	4,229	4,821	2,921	2,099
Artisanal: Inshore	4,241	4,120	3,864	5,029	5,398	4,604	4,655	3,477	4,203	4,566
Artisanal: Lakes	4,345	5,136	4,461	3,818	4,325	2,966	2,809	2,443	2,653	2,830
TOTAL	10,599	12,077	12,337	13,075	14,533	13,961	11,693	10,741	9,777	9,495

Table H.2 Annual Catch (metric tons) of Main Species in Fonseca Gulf (1990-1996)

SPECIES	1990	1991	1992	1993	1994	1995	1996
Shark	254.5	381.6	145.1	106.0	130.8	19.2	90.9
Red Snapper	196.0	490.9	67.3	108.4	100.8	117.3	51.6
Grouper	155.8	250.2	89.4	114.6	87.4	56.3	85.2
Mackerel	0.4	80.5	10.1	15.0	13.9	7.0	8.3
Catfish	0.9	178.1	0.1		0.17	3.0	12.2
Other fish	673.0	1853.90	104.0	135.7	143.8	154.6	129.4
Shrimp	152.6	240.4	182.2	163.9	75.8	210.6	146.6
Other Crustaceans	128.1	244.1	14.9	19.9	17.2	39.9	7.2
Molluscs	405.4	521.1	4.2	4.3	2.0	6.1	1.9
Turtle eggs	0.1						
TOTAL	3956.8	7980.3	617.3	667.7	572.1	714.0	533.3