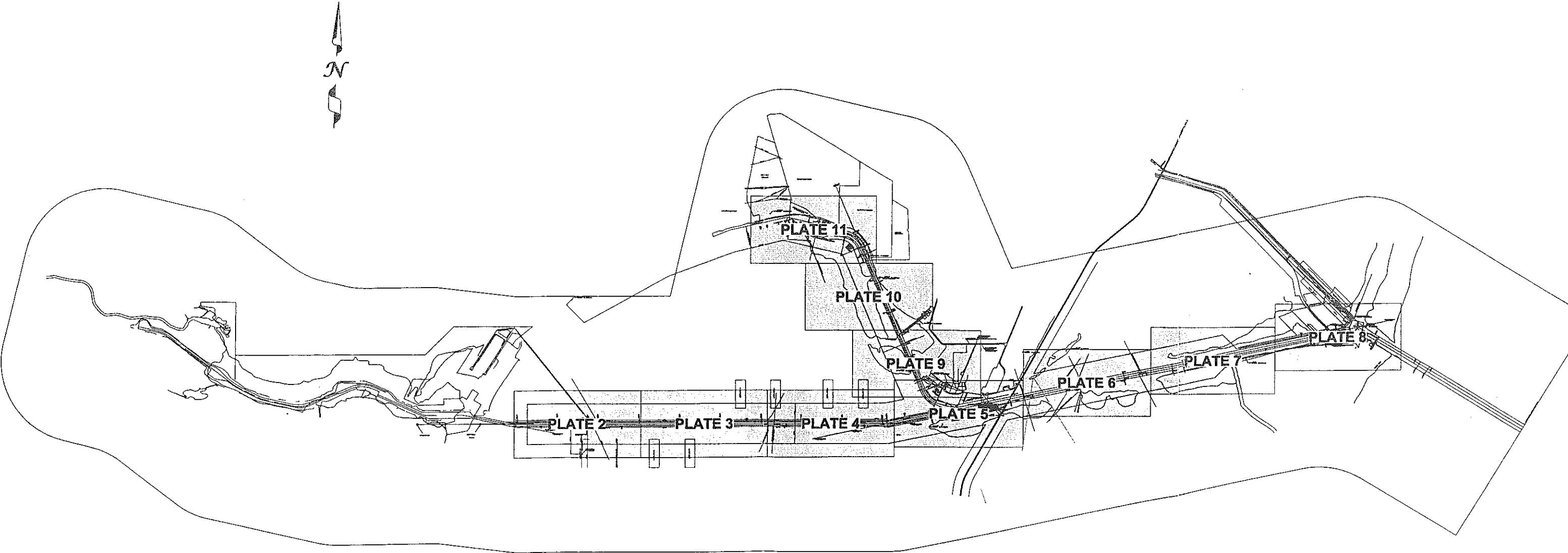
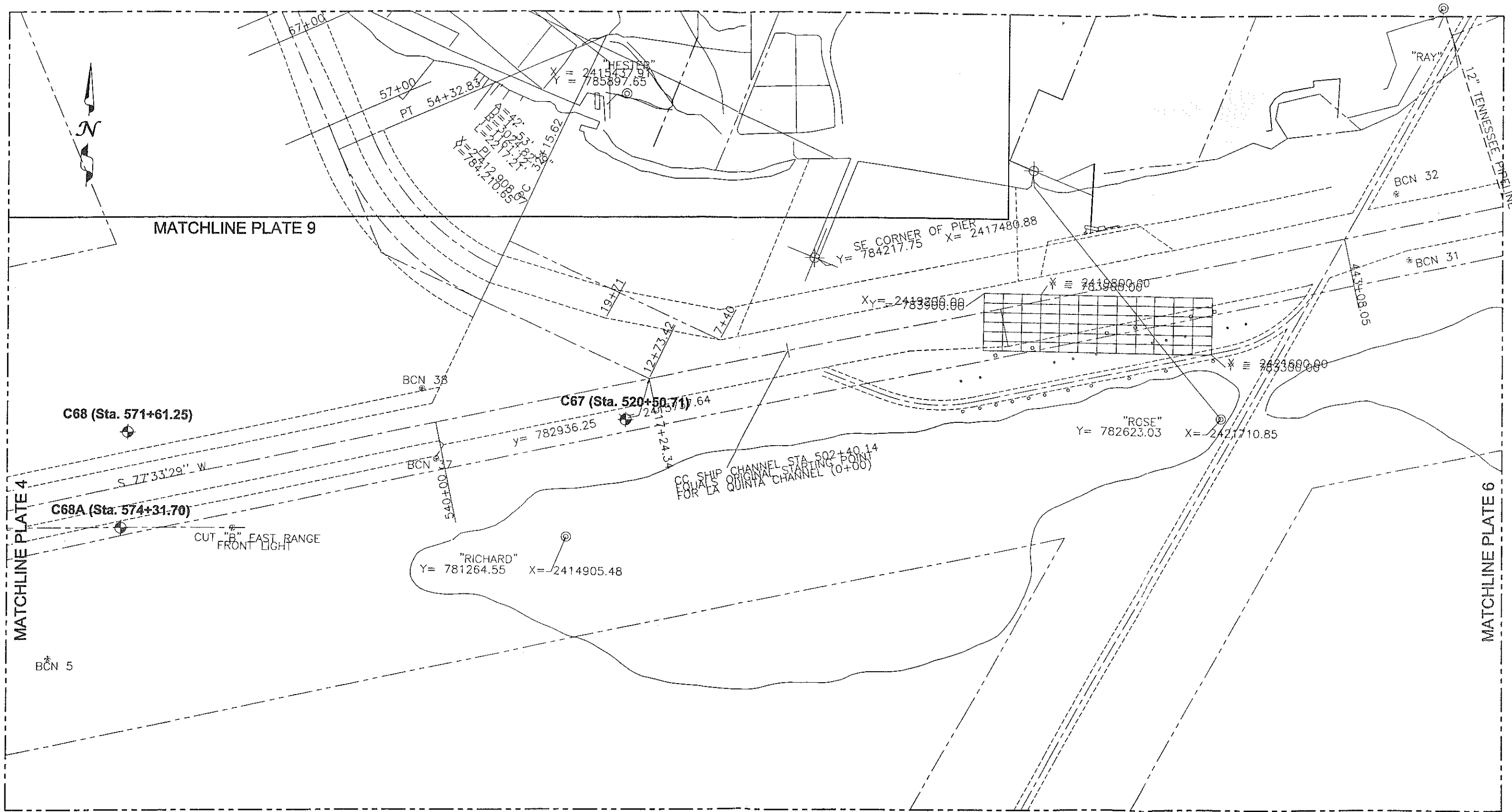




VICINITY MAP
CORPUS CHRISTI SHIP CHANNEL AND
LA QUINTA CHANNEL PROPOSED EXTENSION

0 12000 24000 FEET



PLAN OF BORINGS



LOG OF BORING

PROJECT: Corpus Christi Ship Channel and
La Quinta Channel Extension

PROJECT NO. 1600-0129
BORING NO. C-67
DATE 5/25/2000
ELEV. -17.5 ft (MLT)

CLIENT: Port of Corpus Christi Authority
Corpus Christi, Texas

SHEET 1 of 1

FIELD DATA			LABORATORY DATA									DRILLING METHOD (S) :	
SOIL SYMBOL	DEPTH (FT)	SAMPLES N: BLOWS/FT P: TONS/SQ FT T: TONS/SQ FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	MOISTURE CONTENT	ATTERBERG LIMITS (%)			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	GROUNDWATER INFORMATION:	
				LL	PL	PI						DESCRIPTION OF STRATUM	
	5	P=0.9** P=2.4	29 24	53 32	21 12	32 20	 100	 2.7				Clay, gray, firm. (CH) -with sand seams, 3' to 5'. (CL) -very stiff, 3' to 8'.	
	10	P=1.8*	29	54	21	33						-stiff, 8' to 13'. -brown and gray, below 9'.	
	15	P=2.0		80	22	58						-very stiff, below 13'.	
	20	N=46										Silty sand, gray, dense. -with clay pockets, 18.5' to 30'.	
	25	N=27										-medium-dense, 23.5' to 28.5'.	
	30	N=32										-dense, below 28.5'.	
	35	N=44										-brown and gray, below 34'.	
	40	N=40										TOTAL DEPTH = 40 FT (Below Mudline)	
	45											NOTES: 1) Coordinates: N 782503; E 2415499 2) Depth of water = 19.9 ft 3) Tide elevation = 2.4 ft (MLT) 4) All depths on boring log are depth below mudline, not depth below MLT.	
	50											*sample approximately 10 inches in length. **analytical testing performed on sample.	
	55												
	60												
	65												
	70												
N - STANDARD PENETROMETER TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE T - POCKET TORVANE SHEAR STRENGTH												REMARKS: Logger: C. Gaskin Driller: M. Webb PLATE 13	

TERMS AND SYMBOLS USED ON BORING LOGS FOR SOIL

SOIL TYPES

	CH, fat clays		SC, clayey sands		GC, clayey gravels		CL, lean clays
	SM, silty sands		GM, silty gravels		ML, silts		SW, well-graded sands
	GW, well-graded gravels		Fill, unclassified		SP, poorly-graded sands		GP, poorly-graded gravels

SOIL GRAIN SIZE U.S. STANDARD SIEVE

6"	3"	3/4"	4	10	40	200		
BOULDERS	COBBLES	GRAVEL		SAND			SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		
152	76.2	19.1	4.76	2.00	0.420	0.074		0.002
SOIL GRAIN SIZE IN MILLIMETERS								

CONSISTENCY OF COHESIVE SOILS ⁽²⁾

CONSISTENCY	UNDRAINED SHEAR STRENGTH Kips Per Sq. Ft.
Very Soft	Less Than 0.25
Soft	0.25 to 0.50
Firm	0.5 to 1.00
Stiff	1.00 to 2.00
Very Stiff	2.00 to 4.00
Hard	greater than 4.00

CONDITION OF GRANULAR SOILS ⁽²⁾

NUMBER OF BLOWS PER FT., N	RELATIVE DENSITY
0-4	Very Loose
4-10	Loose
10-30	Medium
30-50	Dense
Over 50	Very Dense

STRUCTURE ⁽¹⁾

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 6 mm thick.
Laminated	Alternating layers of varying material or color with the layers less than 6 mm thick.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusions of small pockets of different soils.

MOISTURE

Dry	-No water evident in sample; fines less than plastic limit.
Moist	-Sample feels damp; fines near the plastic limit
Very Moist	-Water visible on sample; fines greater than plastic limit and less than liquid limit
Wet	-Sample bears free water; fines greater than liquid limit

INCLUSIONS ⁽¹⁾

Parting	-Inclusion <1/8" thick extending through sample.
Seam	-Inclusion 1/8" to 3" thick extending through sample.
Layer	-Inclusion >3" thick extending through sample.
Trace	-<5% of sample.
Few	-5% to 10% of sample.
Little	-10 to 25 % of sample.
Some	-30% to 45% of sample.

REFERENCES:

- 1) ASTM D 2488
- 2) Peck, Hanson, and Thornburn, (1974), Foundation Engineering.

Information on each boring log is a compilation of subsurface conditions and soil and rock classifications obtained from the field as well as from laboratory testing of samples. Strata have been interpreted by commonly accepted procedures. The stratum lines on the logs may be transitional and approximate in nature. Water level measurements refer only to those observed at the times and places indicated, and may vary with time, geologic condition or construction activity.



Summary of Results - Corpus Christi Ship Channel

Boring No.	C-60	C-60	C-60	C-67	C-71A	C-71A	C-76	C-76
Sample Depth Below Mudline (ft)	8-10	13-15	35-36	1	0-2	28	5	26
Sample Elev. (MLT)	-20.2	-25.2	-47.2	-18.5	-17.6	-45.6	-27.8	-48.8
COE Station	120+64.87	120+64.88	120+64.89	520+50.72	718+60.80	718+60.81	960+26.90	960+26.91
Al (mg/kg)	14700.5	14692.2	11048.3	19896.2	20749.2	23592.4	19713.0	15901.6
Ba (mg/kg)	152.8	183.4	31.3	25.7	102.7	141.2	128.1	100.4
Ag (mg/kg)	ND	2.9	2.4	3.8	4	2.7	2.9	7.9
Cd (mg/kg)	0.0886	0.069	0.1583	0.2186	0.1859	0.1386	0.2921	0.1741
Cr (mg/kg)	30.11	22.09	24.34	30.01	46.27	42.67	34.92	32.11
Cu (mg/kg)	4.58	4.54	4.5	4.66	6.64	6.6	3.48	5.52
Pb (mg/kg)	4.1	6.9	6.6	7.5	10.8	14.0	8.6	10.5
Mn (mg/kg)	272.6	44.6	224.7	167.0	398.1	391.7	401.2	350.9
Hg (mg/kg)	0.0154	0.0118	0.009	0.0066	0.00815	0.0064	0.0172	0.00745
Ni (mg/kg)	11.04	4.41	5.69	5.53	8.18	7.09	6.71	6.65
Se (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND
Ag (mg/kg)	ND	ND	ND	ND	0.244	ND	ND	ND
Zn (mg/kg)	40.4	30.1	29.3	42.8	62.1	71.1	60.8	49.1
Fe (mg/kg)	21246.0	13244.8	15758.1	23119.5	30066.5	13548.7	28599.8	27124.8
TOC (wt.%)	7.8	8.0	12.5	9.5	6.6	8.9	8.0	9.0
AVS (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND

detection levels



FUGRO SOUTH, INC.
GULF COAST TESTING LABORATORY



1205 NORTH TANCAHUA
PHONE (361) 882-5411

CORPUS CHRISTI, TEXAS 78401
FAX (361) 883-7133 or 882-4028

RESULT OF TESTS

PROJECT: CHANNEL IMPROVEMENT PROJECT
SAMPLE No. 1 - DEPTH 1 FT.
CLAY (ALL)
BORING C-67

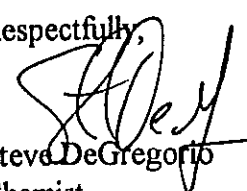
FOR: PORT OF CORPUS CHRISTI AUTHORITY

REPORTED TO: SAME - MR. DAVID KRAMS, P. E.

REPORT DATE: 08-02-00
CLIENT NUMBER: 000709
JOB NUMBER: 00-0022
REPORT NUMBER: 07021-09W
DATE SAMPLED: 05-21-00
DATE RECEIVED: 05-24-00
RECEIVED BY: SD
SAMPLE NUMBER: 0622121-9

PARAMETER	RESULTS	UNITS	RDL	METHOD	TIME/DATE	ANALYST
Aluminum	19896.2	mg/kg	1.0	EPA 202.1	1000/07-05-00	SD
Barium	25.7	mg/kg	0.5	EPA 208.2	1100/07-05-00	SD
Arsenic	3.8	mg/kg	.001	EPA 200.8	1000/07-10-00	LAB
Cadmium	.2186	mg/kg	.001	EPA 213.2	1300/07-05-00	SD
Chromium	30.01	mg/kg	.001	EPA 218.2	1000/06-30-00	SD
Copper	4.66	mg/kg	.002	EPA 220.2	1300/06-29-00	SD
Lead	7.5	mg/kg	.001	EPA 239.2	1100/06-30-00	SD
Manganese	167.0	mg/kg	0.10	EPA 243.1	1400/07-05-00	SD
Mercury	.00660	mg/kg	.005	EPA 7470A	1400/07-19-00	LAB
Nickel	5.53	mg/kg	.001	EPA 249.2	1300/06-30-00	SD
Selenium	ND	mg/kg	.015	EPA 208.2	1000/07-06-00	SD
Silver	ND	mg/kg	.001	EPA 272.2	1400/06-29-00	SD
Zinc	42.8	mg/kg	.025	EPA 289.1	1400/06-30-00	SD
Iron	23119.5	mg/kg	.010	EPA 236.1	1600/07-05-00	SD
Total Organic Carbon	9.5	wt. %	0.10	EPA 415.1	1000/08-01-00	LAB
Acid Volatile Sulphides	ND	mg/kg	0.5	EPA-AVS	0800/08-02-00	LAB

Respectfully,


Steve DeGregorio
Chemist

SD/mj

COMMENTS: Acid Digestion performed on sample

THE TEST RESULTS RELATE TO THE SAMPLE TESTED AND NO OTHER REFERENCE SHALL BE MADE.
THIS REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF THE LABORATORY.

FUGRO SOUTH, INC
QUALITY CONTROL / QUALITY ASSURANCE
AI EPA 202.1

Sample	Total	RESULT	VALUE	UNIT	PERCENT	DATE	LOT #
	TYPE					07-0-5-00	
	Standard	113.500	100.000	ppm	12.6		L029524
	Standard	147.850	150.000	ppm	-1.4		L029524
	Standard	192.530	200.000	ppm	-3.8		L029524
	Standard	98.430	100.000	ppm	-1.6		L029524
	LCS	155.800	150.000	ppm	3.8		996368-18
	Blank				0.0		
0622121	Dupe	11326.600	10223.100		10.2		

FUGRO SOUTH, INC
QUALITY CONTROL / QUALITY ASSURANCE
Ba EPA208.2

Sample	Total	RESULT	VALUE	UNIT	PERCENT	DATE
	TYPE					7/5/00
	Standard	1.000	1.000	ppm	0.0	
	Standard	0.970	1.000	ppm	-3.0	
	Standard	2.000	2.000	ppm	0.0	
	Standard	2.030	2.000	ppm	1.5	
	LCS	1.120	1.000	ppm	11.3	
	Blank				0.0	
	Spike		0.970		97.0	
0622121	Dupe	7.900	7.800		1.3	

FUGRO SOUTH, INC
 QUALITY CONTROL / QUALITY ASSURANCE
 Cd EPA 213.2

Sample	Total	RESULT	VALUE	UNIT	PERCENT	DATE
	TYPE					7/5/00
	Standard	4.000	4.000	ug/L	0.0	
	Standard	2.300	2.000	ug/L	14.0	
	Standard	3.400	3.000	ug/L	12.5	
	Standard	4.600	4.000	ug/L	14.0	
	LCS	4.400	4.000	ug/L	9.5	
	Blank					
622121	Spike		4.600		112.5	
0622121	Dupe	0.200	0.300		-40.0	

FUGRO SOUTH, INC
 QUALITY CONTROL / QUALITY ASSURANCE
 Cr EPA 218.2

Sample	Total	RESULT	VALUE	UNIT	PERCENT	DATE
	TYPE					6/30/00
	Standard	4.900	5.000	ug/L	-2.0	
	Standard	9.900	10.000	ug/L	-1.0	
	Standard	20.000	20.000	ug/L	0.0	
	Standard	25.100	25.000	ug/L	0.4	
	Standard	8.800	10.000	ug/L	-12.8	
	Standard	18.100	20.000	ug/L	-10.0	
	LCS	18.300	20.000	ug/L	-8.9	
	Blank				0.0	
	Spike		18.600		89.9	
0622121	Dupe	35.280	34.560		2.1	

FUGRO SOUTH, INC
QUALITY CONTROL / QUALITY ASSURANCE
Cu EPA 220.2

Sample	Total	RESULT	VALUE	UNIT	PERCENT	DATE
	TYPE					6/29/00
	Standard	5.000	5.200	ug/L	-3.9	
	Standard	10.000	10.800	ug/L	-7.7	
	Standard	20.000	22.800	ug/L	-13.1	
	Standard	25.000	27.300	ug/L	-8.8	
	Standard	5.000	5.100	ug/L	-2.0	
	Standard	10.000	10.400	ug/L	-3.9	
	LCS	20.000	21.200	ug/L	-5.8	
	Blank				0.0	
	Spike		20.200		88.6	
0622121	Dupe	3401.000	3553.000		-4.4	

FUGRO SOUTH, INC
QUALITY CONTROL / QUALITY ASSURANCE
Fe EPA 236.1

Sample	Total	RESULT	VALUE	UNIT	PERCENT	DATE
	TYPE					7/5/00
	Standard	10.100	10.000	ppm	1.0	
	Standard	19.770	20.000	ppm	-1.2	
	Standard	19.840	20.000	ppm	-0.8	
	Standard	28.300	30.000	ppm	-5.8	
	LCS	10.630	10.000	ppm	6.1	
	Blank				0.0	
0622121	Dupe	15217.200	13944.800		8.7	

FUGRO SOUTH, INC
QUALITY CONTROL / QUALITY ASSURANCE

Sample	Total	Pb		EPA 239.2		PERCENT	DATE
	TYPE	RESULT	VALUE	UNIT			
	Standard	5.400	5.000	ug/L		7.7	6/30/00
	Standard	9.900	10.000	ug/L		-1.0	
	Standard	17.300	20.000	ug/L		-14.5	
	Standard	5.500	5.000	ug/L		9.5	
	Standard	10.600	10.000	ug/L		5.8	
	Standard	21.400	20.000	ug/L		6.8	
	LCS	17.700	20.000	ug/L		-12.2	
	Blank					0.0	
	Spike		20.000			88.9	
	Dupe	8.300	8.900		8.3	-7.0	
0622121							

FUGRO SOUTH, INC
QUALITY CONTROL / QUALITY ASSURANCE

Sample	Total	Mn		EPA 243.1		PERCENT	DATE
	TYPE	RESULT	VALUE	UNIT			
	Standard	5.000	5.000	ppm		0.0	7/5/00
	Standard	4.860	5.000	ppm		-2.8	
	Standard	2.850	3.000	ppm		-5.1	
	Standard	1.960	2.000	ppm		-2.0	
	LCS	4.860	5.000	ppm		-2.8	
	Blank					0.0	
	Spike		0.870			87.0	
	Dupe	76.700	74.500			2.9	
0622121							

FUGRO SOUTH, INC
 QUALITY CONTROL / QUALITY ASSURANCE
 Ni EPA 249.2

Sample	Total					DATE
	TYPE	RESULT	VALUE	UNIT	PERCENT	
						29-Jun
	Standard	8.700	10.000	ug/L	-13.9	
	Standard	30.800	30.000	ug/L	2.6	
	Standard	49.800	50.000	ug/L	-0.4	
	Standard	8.700	10.000	ug/L	-13.9	
	Standard	27.500	30.000	ug/L	-8.7	
	Standard	50.100	50.000	ug/L	0.2	
	LCS	18.700	20.000	ug/L	-6.7	
	Blank				0.0	
	Spike		18.500		92.5	
0622121	Dupe	6.600	6.900		-4.4	

FUGRO SOUTH, INC
 QUALITY CONTROL / QUALITY ASSURANCE
 Se EPA 200.9

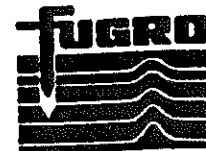
Sample	Total					DATE
	TYPE	RESULT	VALUE	UNIT	PERCENT	
						7/6/00
	Standard	25.000	25.000	ug/L	0.0	
	Standard	17.600	20.000	ug/L	-12.8	
	Standard	21.900	20.000	ug/L	9.1	
	LCS	18.600	20.000	ug/L	-7.3	
	Blank					
0622121	Spike		18.000		90.0	
0622121	Dupe	< .015	< .015		0.0	

FUGRO SOUTH, INC
QUALITY CONTROL / QUALITY ASSURANCE

Sample	Total	Ag		EPA 272.2		
	TYPE	RESULT	VALUE	UNIT	PERCENT	DATE
						6/29/00
	Standard	5.200	5.000	ug/L	3.9	
	Standard	9.900	10.000	ug/L	-1.0	
	Standard	5.200	5.000	ug/L	3.9	
	Standard	10.100	10.000	ug/L	1.0	
	LCS	9.600	10.000	ug/L	-4.1	
	Blank				0.0	
0622121	Spike		4.400		88.0	
0622121	Dupe	0.000	0.000		0.0	

FUGRO SOUTH, INC
QUALITY CONTROL / QUALITY ASSURANCE

Sample	Total	Zn		EPA 289.1		
	TYPE	RESULT	VALUE	UNIT	PERCENT	DATE
						6/30/00
	Standard	0.532	0.500	ppm	6.2	
	Standard	0.473	0.500	ppm	-5.6	
	Standard	0.708	0.700	ppm	1.1	
	Standard	0.995	1.000	ppm	-0.5	
	LCS	0.935	1.000	ppm	-6.8	
	Blank				0.0	
	Spike		9.100		91.0	
0622121	Dupe	24.100	23.000		4.7	



Gulf Coast Testing Laboratory

1205 N. Tancanhua Street
Corpus Christi, Texas 78401
Phone: 361-882-5411
Fax : 361-882-4028

SET Quality Control/Quality Assurance for Project 135117

Total Aluminum

(Analyzed: 07/18/2000 1100 WOB Verified: 07/19/2000 09:17 SAH)

Sample	Type	Result	Value	Unit	Percent
455737	Spike		0.100	ppm	95.0
457317	Spike		0.100	ppm	34.0
457317	Spike		0.100	ppm	58.0

Total Arsenic

(Analyzed: 07/10/2000 1600 WOB Verified: 07/11/2000 10:48 SAH)

Sample	Type	Result	Value	Unit	Percent
	Standard	0.103	0.100	ppm	3.0
	Standard	0.299	0.300	ppm	-0.3
	Standard	0.306	0.300	ppm	2.0
	Standard	0.304	0.300	ppm	1.3
	Standard	0.299	0.300	ppm	-0.3
	Standard	0.295	0.300	ppm	-1.7
	Standard	0.293	0.300	ppm	-2.3
	Standard	0.296	0.300	ppm	-1.3
	Standard	0.307	0.300	ppm	2.3
	Standard	0.101	0.100	ppm	1.0
	Standard	0.300	0.300	ppm	0.0
	Standard	0.303	0.300	ppm	1.0
	Standard	0.308	0.300	ppm	2.7
	Standard	0.303	0.300	ppm	1.0
	LCS	0.559	0.500	ppm	11.8
	LCS	0.514	0.500	ppm	2.8
	LCS	0.552	0.500	ppm	10.4
	LCS	0.544	0.500	ppm	8.8
	Blank	<0.00100		ppm	
	Blank	<0.00100		ppm	
	Blank	0.00109		ppm	
	Blank	<0.00100		ppm	
457393	Spike		0.500	ppm	111
457393	Spike		0.500	ppm	113
454997	Spike		0.500	ppm	111
457397	Spike		0.500	ppm	111
457123	Spike		0.500	ppm	110
455123	Spike		0.500	ppm	109
457257	Spike		0.500	ppm	109
457257	Spike		0.500	ppm	109

Total Mercury

(Analyzed: 07/12/2000 1121 WOB Verified: 07/12/2000 15:05 SAH)

Sample	Type	Result	Value	Unit	Percent
	Standard	24.8	25.0	ppb	-0.8



SET Quality Control/Quality Assurance for Project 135117

Total Aluminum

(Analyzed: 07/18/2000 1100 WOB Verified: 07/19/2000 09:17 SAH)

Sample	Type	Result	Value	Unit	Percent
	Standard	0.103	0.100	ppm	3.0
	Standard	0.313	0.300	ppm	4.3
	Standard	0.302	0.300	ppm	0.7
	Standard	0.299	0.300	ppm	-0.3
	Standard	0.296	0.300	ppm	-1.3
	Standard	0.328	0.300	ppm	9.3
	Standard	0.307	0.300	ppm	2.3
	Standard	0.318	0.300	ppm	6.0
	Standard	0.296	0.300	ppm	-1.3
	Standard	0.293	0.300	ppm	-2.3
455737	Spike		0.100	ppm	136

Organic Carbon

(Analyzed: 08/01/2000 0929 CAL Verified: / /)

Sample	Type	Result	Value	Unit	Percent
	Blank	0.0000		grams	
455244	Duplicate	10.0	9.92	%	0.5

Total Mercury

(Analyzed: 07/12/2000 1121 WOB Verified: 07/12/2000 15:05 SAH)

Sample	Type	Result	Value	Unit	Percent
	Standard	5.08	5.00	ppb	1.6
	Standard	5.22	5.00	ppb	4.4
	Standard	5.11	5.00	ppb	2.2
	Standard	5.12	5.00	ppb	2.4
	LCS	9.29	10.0	ppb	-7.1
	Blank	0.131		ppb	
455244	Spike		10.0	ppb	94.5
455244	Spike		10.0	ppb	95.4
455535	Spike		10.0	ppb	86.0
455535	Spike		10.0	ppb	83.0

Ash

(Analyzed: 07/21/2000 1540 KDJ Verified: 07/27/2000 14:57 SAH)

Sample	Type	Result	Value	Unit	Percent
	Blank	0.0000		grams	
455244	Duplicate	79.1	80.2	%	0.9
	Blank	+0.0001		grams	
455254	Duplicate	46.9	47.4	%	0.7

Moisture

(Analyzed: 07/27/2000 1100 MAM Verified: 08/01/2000 09:28 WJP)

Sample	Type	Result	Value	Unit	Percent
	Blank	0.0000		g	
455244	Duplicate	9.95	9.81	%	0.9
455247	Duplicate	17.0	17.0	%	0.0
455250	Duplicate	10.2	10.2	%	0.0

Acid Volatile Sulfide

(Analyzed: 08/01/2000 1400 RSV Verified: 08/01/2000 15:50 SAH)

Sample	Type	Result	Value	Unit	Percent
	Standard	1.99	2.00	ppm	-0.5
	Standard	5.03	5.0	ppm	0.6
	Standard	5.03	5.0	ppm	0.6
	Standard	5.03	5.0	ppm	0.6
	Standard	5.03	5.0	ppm	0.6
	Blank	<0.050		ppm	
455245	Duplicate	ND	ND	mg/kg	0.0