FINA OIL & CHEMICAL
COSDEN CHEMICAL DIV.

CALUMET CITY, ILLINOIS

ENSR

REPORT ON SOIL & GROUNDWATER SAMPLING

VARIOUS OTHER PLANT LOCATIONS

ENSR Constructors

May 1990

Document Number 9500-058-340

EPA Region 5 Records Ctr.

305048

ENSR

ENSR Constructors
740 Pasquinelli Drive
Suite 124
Westmont, Illinois 60559
708-887-1700

May 9, 1990

Mr. Gerry Hardin
Fina Oil & Chemical
Cosden Chemical Division
P. O. Box 178
Calumet City, IL 60409

Dear Gerry:

Enclosed are the results from the soil, and groundwater analytical work performed at various other plant locations located at your Calumet City facility. Also included is a groundwater elevation map which was developed as part of the project.

As can be seen from the soil and water analysis, Ethylbenzene, Styrene, and Formaldehyde occur in noticeable amounts in various locations. Further study will have to be performed (as was done with other areas of the facility) to determine the actual risk posed by these chemicals in these areas.

If you have any further questions on this, or any other work to be performed at the site, please do not hesitate to call.

Sincerely,

ENSR CONSTRUCTORS

John J. Schiffgens, II
Project Manager

JJS/bjp

Enclosure

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CALUMET CITY, ILLINOIS

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Formerly ERT

May 9, 1990

ENSR Consulting
and Engineering
740 Pasquinelli Drive
Westmont, Illinois 60559
(708) 887-1700
FAX (708) 850-5307

ENSR Project No: 9500-058-340

Mr. Gerry Hardin
Fina Oil & Chemical
Cosden Chemical Division
P.O. Box 178
Calumet City, Illinois 60409

SUBJECT: Report on the Soil and Groundwater Sampling Investigation Conducted at the Fina Oil & Chemical, Cosden Chemical Division in Calumet City, Indiana

Dear Mr. Hardin:

ENSR Consulting and Engineering (ENSR) is pleased to present the results of the soil and groundwater sampling investigation conducted at the subject site. Between March 27 through March 30, 1990, and on April 12, 1990, ENSR conducted a subsurface investigation at the Fina Oil & Chemical, Cosden Chemical Division facility in Calumet City, Illinois. The field work involved in the investigation included collecting soil samples for laboratory analysis, installation of one monitoring well, collection and analysis of groundwater samples, and obtaining groundwater elevations using differential leveling techniques. These tasks are described in greater detail below.

FIELD INVESTIGATION

ENSR subcontracted with Fox Drilling, Inc. (Fox), of Itasca, Illinois, to drill 16 soil borings ranging in depth from 8 to 15 feet below ground surface. The borings, designated MW-4A, SS-4A, SS-5A, SS-10A, SS-10B, SS-13A, SS-14A, SS-14B, SS-15A, SS-15B, SS-16A, SS-16B, SS-17A, and SS-17B, were drilled between March 27, 1990, and March 30, 1990. Because of access problems, borings SS-11A and SS-12A were hand augered on April 12, 1990. Boring and well locations are presented in Figure 1.

After the equipment and tools used for drilling the borings had been thoroughly steam cleaned, Fox began drilling at the location designated MW-4A. All borings were advanced using hollow-stem auger and were terminated when silty clay was encountered, typically 8 to 10 feet below the ground surface (see Attachment 1 for boring logs).

Soil samples were collected above and at the water table for laboratory analysis. The depth to the water table at the site ranged from 2 feet to 4 feet below the ground surface. The soil samples were collected using a stainless steel split-spoon sampler (Per ASTM D1586) and field-screened using a photo-ionization detector (PID). The PID measures volatile compounds released from the soils. As a health and safety precaution, the PID was also used to measure volatile compounds present in the breathing zone. The split-spoon sampler was decontaminated using a high-pressure steam cleaner before the collection of each sample to ensure that cross contamination between samples and borings did not occur.

Each soil sample collected was analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene using EPA Method SW-846: 8020[1] and for formaldehyde using NIOSH Method 3500[2]. To evaluate that proper decontamination procedures had been followed, field blank samples were collected for BTEX analysis. The field blank is a quality assurance/quality control (QA/QC) sample used to assess whether sampling equipment has been thoroughly decontaminated and whether cross contamination between samples and borings has occurred. The field blank was prepared by collecting distilled water that was rinsed through decontaminated sampling equipment. One duplicate soil sample (MW-4B) was also collected from boring MW-4A to provide a quality check of laboratory analysis.

All samples were collected using ENSR's Standard Operating Procedures (SOPs) and sent to ENSR's Houston, Texas, laboratory under chain-of-custody procedures. The analytical laboratory results for the soil samples and for the field blank are summarized in Table 1, Attachment 2. The laboratory report for the soil sampling is presented in Attachment 3.

MONITORING WELL INSTALLATION

After boring MW-4A was drilled to a suitable depth, the borehole was converted into a monitoring well. The monitoring well consisted of a 5-foot-long, 2-inch-diameter, number 10-slot, flush joint threaded, stainless steel screen. The screen was attached to a 2-inch-diameter, flush joint threaded, stainless steel pipe extending approximately 2 feet above ground level.

---

1 EPA Methods for Evaluating Solid Wastes: Physical/Chemical Methods, SW-846, 3rd edition, 1986.

2 NIOSH Manual of Analytical Methods Formaldehyde, Method 3500, 3rd edition, vol. one, 1984.

The annular space between the screen and the borehole wall was backfilled with a sandpack to approximately 1 foot above the top of the screen. High-density bentonite pellets formed an approximately 1-foot-thick bentonite seal above the sandpack. Grout was placed above the bentonite seal and a protective cover was placed over the riser to guard against damage and vandalism. The well completion log is presented in Attachment 1.

GROUNDWATER SAMPLING

In order to obtain representative groundwater samples from monitoring well MW-4A and from the existing wells on-site (MW-1 through MW-7), three volumes of water were purged from each well. The wells averaged 1.5 gallons of water per well volume. Monitoring wells MW-1 and MW-2 were bailed dry and did not recharge. Therefore, samples from these wells were not obtained for analysis. Monitoring well MW-3 contained a white foamy substance, which was sampled and analyzed.

Groundwater samples were collected from monitoring well MW-4A and MW-3 through MW-7 and analyzed for BTEX and styrene using EPA Method SW-846: 8020 and for formaldehyde using NIOSH Method 3500. A field blank was collected to evaluate that proper decontamination procedures had been followed. A duplicate groundwater sample (MW-4B) was also collected from MW-4 to provide a quality check of laboratory analysis. The groundwater sampling results are summarized in Table 2, Attachment 2. The analytical laboratory results and chain-of-custody procedures for the groundwater samples are presented in Attachment 3.

GROUNDWATER LEVEL ELEVATIONS

Differential leveling techniques were used to establish elevations at the monitoring well locations relative to an on-site datum. The bolt on top of the fire hydrant located to the east of the maintenance shop was assumed to have a reference elevation of 100.00 feet. The computed ground surface and top-of-casing elevations relative to the assumed fire hydrant bolt elevation are presented in Table 3, Attachment 2.

Relative groundwater elevations were computed by subtracting the measured depth to groundwater (from top-of-casing) from the relative top-of-casing elevations. Figure 1 shows relative water level elevations measured on May 3, 1990. The relative water level elevations show the direction of groundwater flow to be towards the Little Calumet River.

ENSR

If you have any questions regarding the field investigation activities or laboratory results, please do not hesitate to call.

Sincerely,

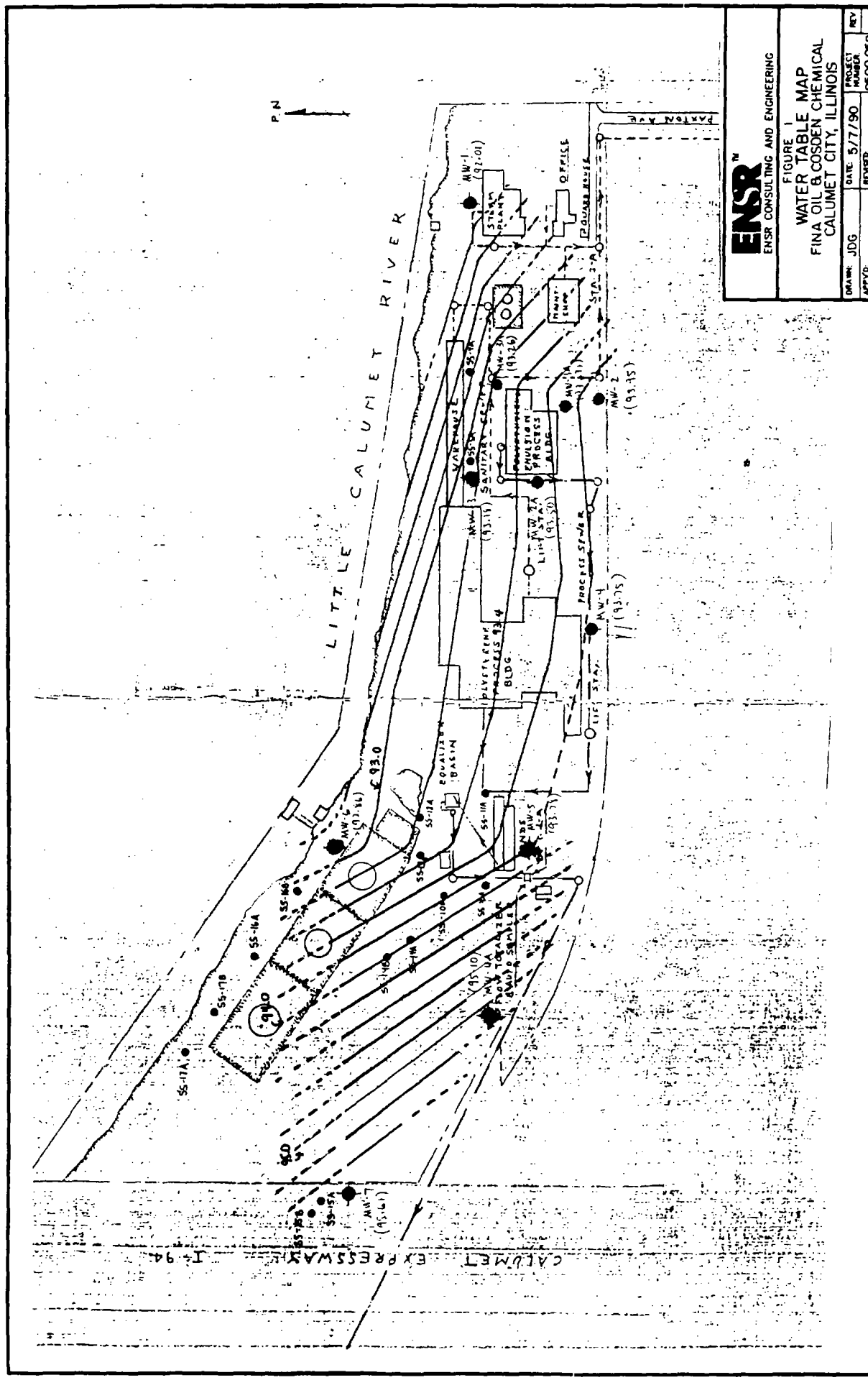
Gregory J. Smith
Department Manager
Senior Hydrogeologist

GJS/js

Enclosure

Ref. No. 90-04-G365

FIGURE 1


ENSR
ENSR CONSULTING AND ENGINEERING
FIGURE 1
WATER TABLE MAP
FINA OIL & COSDEN CHEMICAL
CALUMET CITY, ILLINOIS
DRAWN: JDG
DATE: 5/7/90
PROJECT NUMBER: 9500-058
APPV'D:
REVISED:
REV
N
LITTLE CALUMET RIVER
CALUMET EXPRESSWAY
I-94
PATTON AVE
OFFICE
POWER HOUSE
STEAM PLANT
EMULSION PROCESS BLDG
WAREHOUSE
SANITARY SEWER
PROCESS SEWER
EQUALIZATION BASIN
BLDG
MW-1 (92.01)
MW-2 (93.35)
MW-3 (93.26)
MW-4 (93.35)
MW-5 (93.71)
MW-6 (93.56)
MW-7 (95.61)
MW-8 (93.19)
MW-9 (93.30)
MW-10 (95.10)
MW-11
MW-12
MW-13
MW-14
MW-15
MW-16
MW-17
MW-18
MW-19
MW-20
MW-21
MW-22
MW-23
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MW-26
MW-27
MW-28
MW-29
MW-30
MW-31
MW-32
MW-33
MW-34
MW-35
MW-36
MW-37
MW-38
MW-39
MW-40
MW-41
MW-42
MW-43
MW-44
MW-45
MW-46
MW-47
MW-48
MW-49
MW-50

ATTACHMENT 1

SOIL BORING AND WELL INSTALLATION LOGS

LOG OF BORING

MW-4A

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC.

GROUND ELEV. : 96.60
T.O.C. ELEV. : 98.68

DATE STARTED : 3-27-90 TOTAL DEPTH : 10.0 ft
DATE COMPLETED : 3-27-90 METHOD : HSA

WELL I.D. : 2.0 SCREEN LENGTH : 5.0
CASING LENGTH : 6.0 SLOT SIZE : 0.10
TYPE : 304 Stainless Steel TYPE : 304 Stainless Stee

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION
							CLAY (CL) - silty, little sand, fine grained, soft, gray
			S-1	s.s.	12	0	
							SAND (SP) - fine grained, gray
			S-2	s.s.	7	0	
5							
			S-3	s.s.	14	0	
							CLAY (CL) - silty, trace sand, gray
10							END OF BORING @ 10.0

GRAPHIC LOG | WELL COMPLETION | WATER 3-28-90 | DEPTH (feet)

LOG OF BORING

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 3-28-90
DATE COMPLETED : 3-28-90

TOTAL DEPTH : 10.0 ft
METHOD : CFA

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH (feet)
							Sandy SILT (SM) - fine to medium grained, soft, black to gray				
			S-1	s.s.	2	0				3-29-90	
5											5
			S-2	s.s.	2	0					
10							END OF BORING @ 10.0				10

LOG OF BORING

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 3-28-90
DATE COMPLETED : 3-28-90

TOTAL DEPTH : 10.0 ft
METHOD : CFA

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH (feet)
							Sandy SILT (SM) - fine to medium grained, soft, black to gray				
			S-1	s.s.	2	0				3-29-90	
							Silty CLAY (CL-ML) - some sand, fine to medium grained, soft, black to gray				
5											5
			S-2	s.s.	3	0	Sandy SILT (SM) - fine to medium grained, soft, black to gray				
10							END OF BORING @ 10.0				10

LOG OF BORING

SS10-A

CLIENT : **FINA OIL AND CHEMICAL**
PROJECT NAME : **FINA**
PROJECT LOCATION : **CALUMET CITY, ILLINOIS**

PROJECT NUMBER : **9500-058-340**

LOGGED BY : **T.DAPPAS**
APPROVED BY : **G.SMITH**
DRILLED BY : **FOX DRILLING, INC.**

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : **3-27-90**
DATE COMPLETED : **3-27-90**

TOTAL DEPTH : **10.0 ft**
METHOD : **CFA**

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH (feet)
							FILL - gravel, cobbles, boulders, wood				
			S-1	**s.s.**	**6**	**0**	**SAND (SP) - fine to medium grained, grey**			3-28-90	
5											5
			S-2	**s.s.**	**4**	**0**	**Sandy SILT (SM) - fine to medium grained, soft, brown**				
							CLAY (CL) - some silt, trace sand, grey				
10							**END OF BORING @ 10.0**				10

LOG OF BORING

SS10-B

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-056-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC.

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 3-27-90
DATE COMPLETED : 3-27-90

TOTAL DEPTH : 10.0 ft
METHOD : CFA

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH (feet)
							FILL - gravel, cobbles, boulders, wood				
										3-28-90	
	X	■	S-1	s.s.	5	0	Silty SAND (SM) - fine to medium grained, gray				
5											5
							Clayey SILT (CL-ML) - some sand, fine to medium grained, brown to gray,				
	X	■	S-2	s.s.	3	0					
10							END OF BORING @ 10.0				10

LOG OF BORING

SS11-A

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY :

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 4-12-90
DATE COMPLETED : 4-12-90

TOTAL DEPTH : 8.5 ft
METHOD : HAND AUGER

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH
							Silty SAND (SM) - fine to medium grained, black				
	X		S-1	ha							
							SAND (SP) - fine to medium grained, brown			4-12-90	
	X		S-2	ha							
5											
							END OF BORING @ 8.5				
10											1

LOG OF BORING

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY :

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 4-12-90
DATE COMPLETED : 4-12-90

TOTAL DEPTH : 8.0 ft
METHOD : HAND AUGER

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH (feet)
							CLAY (CL) - trace sand, fine to medium grained, brown to gray				
			S-1	ha							
5			S-2	ha						4-12-90	5
							Sandy SILT (SM) - fine to medium grained, black				
							END OF BORING @ 8.0				
10											10

LOG OF BORING

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 3-28-90
DATE COMPLETED : 3-28-90

TOTAL DEPTH : 10.0 ft
METHOD : CFA

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH
							Silty SAND (SM) - fine to medium grained, trace gravel, black to gray, very soft				
			S-1	s.s.	2	2				3-29-90	
5											
			S-2	s.s.	2	0					
10							END OF BORING @ 10.0				1

LOG OF BORING

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 3-27-90
DATE COMPLETED : 3-27-90

TOTAL DEPTH : 10.0 ft
METHOD : CFA

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH (feet)
							CLAY (CL) - silty, some sand, fine to medium grained, trace gravel, brown to gray				
							SAND (SP) - fine to medium grained, brown.			3-28-90	
	X	■	S-1	s.s.	6	0					
5											5
	X	■	S-2	s.s.	5	0	Sandy SILT (SM) - fine to medium grained, gray				
10							END OF BORING @ 10.0				10

LOG OF BORING

SS14-B

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 3-28-90
DATE COMPLETED : 3-28-90

TOTAL DEPTH : 10.0 ft
METHOD : CFA

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH
							Clayey SILT (CL-ML) - trace sand, fine to medium grained, soft, brown to gray				
	X	■	S-1	s.s.	3	0					
							CLAY (CL) - silty, trace sand, fine to medium grained, brown			3-29-90	
5											
							Clayey SAND (SC) - fine to medium grained, brown				
	X	■	S-2	s.s.	5	0	Sandy CLAY (SC) - fine to medium grained, brown				
							CLAY (CL) - silty, trace sand, fine to medium grained, gray				
10							END OF BORING @ 10.0				1

LOG OF BORING

SS15-A

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC.

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 3-27-90
DATE COMPLETED : 3-27-90

TOTAL DEPTH : 10.0 ft
METHOD : CFA

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH (feet)
							SILT (ML) - some sand, trace clay, soft, brown to grey			3-28-90	
			S-1	s.s.	4	0	Silty SAND (SM) - fine to medium grained, black to grey				
5											5
							SAND (SP) - fine to medium grained, saturated, brown to grey				
			S-2	s.s.	13	0					
							CLAY (CL) - some silt, trace sand, fine grained, grey				
10							END OF BORING @ 10.0				1

LOG OF BORING

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-3340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC.

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 3-27-90
DATE COMPLETED : 3-27-90

TOTAL DEPTH : 10.0 ft
METHOD : CFA

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH (feet)
							CLAY (CL) - silty, trace sand, fine to medium grained, plastic, brown to gray				
	X	■	S-1	s.s.	5	0				3-27-90 ▽	
							Silty SAND (SM) - fine to medium grained, black to gray *Petroleum order present after split-spoon removal				
	X	■	S-2	s.s.	4	6					
5											5
							SAND (SP) - fine to medium grained, gray				
10							END OF BORING @ 10.0				1

LOG OF BORING

SS16-A

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC.

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 3-28-90
DATE COMPLETED : 3-28-90

TOTAL DEPTH : 15.0 ft
METHOD : CFA

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH (feet)
							CLAY (CL) - silty, trace sand, fine to medium grained, gray				
	X	■	S-1	s.s.	4	0					
5										3-28-90	5
	X	■	S-2	s.s.	10	0	SAND (SP) - fine to medium grained, brown to gray				
							CLAY (CL) - silty, some sand, fine to medium grained, gray				
10											10
15							END OF BORING @ 15.0				1

LOG OF BORING

SS16-B

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 3-28-90
DATE COMPLETED : 3-28-90

TOTAL DEPTH : 15.0 ft
METHOD : CFA

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH (feet)
							CLAY (CL) - silty, some sand, fine to medium grained, soft, gray				
							Sandy SILT (SM) - fine to medium grained, gray				
	X	■	S-1	s.s.	3	0					
5										3-29-90	5
							Silty Clay (CL-ML) - some sand, fine to medium grained, soft, gray				
							SAND (SP) - fine to medium grained, gray				
	X	■	S-2	s.s.	11	0					
10											10
							CLAY (CL) - silty, trace sand, gray				
15											1
							END OF BORING @ 15.0				

LOG OF BORING

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC.

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 3-28-90
DATE COMPLETED : 3-28-90

TOTAL DEPTH : 10.0 ft
METHOD : CFA

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH
							CLAY (CL) - silty, trace sand, fine to medium grained, brown				
	X	■	S-1	s.s.	5	0					
							SAND (SP) - fine to medium grained, brown			3-29-90 ▽	
							CLAY (CL) - silty, some sand, fine to medium grained, trace gravel, gray				
5											
	X	■	S-2	s.s.	9	0	SAND (SP) - fine to medium grained, brown				
							CLAY (CL) - silty, trace sand, fine to medium grained, gray				
10							END OF BORING @ 10.0				

LOG OF BORING

SS17-B

CLIENT : FINA OIL AND CHEMICAL
PROJECT NAME : FINA
PROJECT LOCATION : CALUMET CITY, ILLINOIS

PROJECT NUMBER : 9500-058-340

LOGGED BY : T.DAPPAS
APPROVED BY : G.SMITH
DRILLED BY : FOX DRILLING, INC.

GROUND ELEV. :
T.O.C. ELEV. :

DATE STARTED : 3-28-90
DATE COMPLETED : 3-28-90

TOTAL DEPTH : 10.0 ft
METHOD : CFA

WELL I.D. :
CASING LENGTH :
TYPE :

SCREEN LENGTH :
SLOT SIZE :
TYPE :

DEPTH (feet)	LENGTH	RECOVERY	SAMPLE NUMBER	SAMPLE TYPE	N-VALUE	OVA	DESCRIPTION	GRAPHIC LOG	WELL COMPLETION	WATER	DEPTH (feet)
							CLAY (CL) - silty, trace sand, fine to medium grained, gray				
	X	■	S-1	s.s.	9	0					
5										3-29-90	5
							SAND (SP) - fine to medium grained, brown				
	X	■	S-2	s.s.	7	0	CLAY (CL) - silty, trace sand, fine to medium grained				
10							END OF BORING @ 10.0				10

ATTACHMENT 2

TABLES

TABLE 1
SUMMARY OF SOIL SAMPLING RESULTS[1]

Parameter	14B/ 1.5-2 ft.	14B/ 6.5-7 ft.	14B-1/ 1.5-2 ft.	14B-1/ 6.5-7 ft.	17A/ 2.5-2.9 ft.	17A/ 8.5-9 ft.	17B/ 2.5-3 ft.	17B/ 7-7.5 ft.	16A 3-3.5 ft	16A/ 6.5-7 ft	16B/ 3-3.5 ft.	16B/ 9-9.5 ft.
Benzene	<125[2]	<125	<125	<125	<125	<125	<125	<125	<125	<125	<125	<125
Ethylbenzene	<125	<125	<125	<125	<125	<125	<125	<125	<125	170	7100	330
Toluene	<125	<125	<125	<125	<125	<125	<125	<125	<125	<125	<125	<125
Xylene	<125	<125	<125	<125	<125	<125	<125	<125	<125	<125	<125	<125
Styrene	<125	<125	<125	<125	<125	<125	<125	<125	<125	<125	<125	<125

Parameter	13A/ 2-2.5 ft.	13A/ 7.5-8 ft.	5A/ 1-1.5 ft.	5A/ 5.5-6 ft.	4A/ 1-1.5 ft.	4A/ 5.5-6 ft.	Trip Blank[3]	Equip. Blank[4]	MW-4A, 1-3 ft	MW-4A, 6-7 ft.	15-A, 3.5-4 ft.	15-A 8-9 ft.
Benzene	<125	<125	<125	<125	<125	<125	<1	<1	<125	<125	<125	<125
Ethylbenzene	2500	1900	<125	<125	320	<125	<1	<1	<125	<125	<125	<125
Toluene	<125	<125	<125	<125	<125	<125	<1	<1	<125	<125	<125	<125
Xylene	<125	<125	<125	<125	<125	<125	<1	<1	<125	<125	<125	<125
Styrene	8500	6700	<125	<125	<125	<125	NA	NA	<125	<125	<125	<125
Formaldehyde	NA[5]	NA	NA	NA	NA	NA	NA	NA	0.125	<0.100	NA	NA

---

1 BTEX and Styrene concentrations reported in parts per billion (ppb) = µg/kg. Formaldehyde concentrations reported in parts per million (ppm) = mg/kg.

2 < indicates concentration is below the method detection limit. The number following the < is the detection limit.

3 Trip Blank

4 Equipment Blank

5 NA = Not Analyzed

TABLE 1
SUMMARY OF SOIL SAMPLING RESULTS[1]
Continued

Parameter	15-B, 1.5-2 ft.	15-B, 4-4.5 ft.	10-A, 2.5-3 ft.	10-A, 8-8.5 ft.	10-B, 3-3.5 ft.	10-B, 8-8.5 ft.	14-A, 3.5-4 ft.	14-A, 7.5-8 ft.	Trip Blank[2]	Equip. Blank[3]	12A/ 1.5-2 ft.	12A/ 5-6 ft.
Benzene	<125[4]	<125	<125	<125	140	<125	<125	<125	<1	<1	<125	<125
Ethylbenzene	<125	470	<125	<125	<125	<125	<125	<125	<1	<1	<125	<125
Toluene	<125	<125	<125	<125	<125	<125	<125	<125	<1	<1	440	<125
Xylene	<125	<125	<125	<125	<125	<125	<125	<125	<1	<1	<125	<125
Styrene	<125	<125	<125	<125	<125	<125	<125	<125	NA[5]	NA	<125	<125

Parameter	11A/ 2.5-3 ft.	11A/ 4.5-5 ft.	11B/ 2.5-3 ft.	11B/ 4.5-5 ft.
Benzene	<125	<125	<125	<125
Ethylbenzene	<125	<125	<125	<125
Toluene	<125	<125	<125	<125
Xylene	<125	<125	<125	<125
Styrene	<125	<125	<125	<125

---

1 BTEX and Styrene concentrations reported in parts per billion = μg/kg. Formaldehyde concentrations reported in parts per million (ppm) = mg/kg.

2 Trip Blank

3 Equipment Blank

4 < indicated concentration is below the method detection limit. The number following the < is the detection limit.

5 NA = Not Analyzed

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS[1]

Parameter	MW-4A	MW-4B[2]	MW-7 Old	MW-6 Old	E.B.[3]	MW-5 Old	MW-4 Old	T.B.	MW-3 Old	T.B.[4]	F.B.[3]
Benzene	<1[5]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	<1	<1	<1	<1	<1	<1	30	<1	<1	<1	<1
Toluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.1
Xylene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Formaldehyde	<0.025	0.038	0.068	0.042	0.055	0.183	0.033	NA[6]	0.439	NA	NA
Styrene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

1 BTEX and Styrene concentrations reported in parts per billion (ppb) = µg/L. Formaldehyde concentrations reported in parts per million (ppm) = mg/l.

2 Duplicate of Sample NW-4A

3 Equipment Blank/Field Blank

4 Trip Blank

5 < indicates concentration is below the method detection limit. The number following the < is the detection limit.

6 NA = Not Analyzed

TABLE 3

RELATIVE SURFACE AND GROUNDWATER ELEVATIONS[1]

Monitoring Well Number	Relative Ground Surface Elevation (ft.)	Relative Top of Casing Elevation (ft.)	Depth to Groundwater (ft.)[2]	Relative Groundwater Elevation (ft.)
MW-1	97.10	99.33	7.32	92.01
MW-2	95.37	97.93	3.98	93.95
MW-3	95.50	97.68	4.50	93.18
MW-4	96.32	98.68	4.93	93.75
MW-5	96.18	98.88	5.10	93.78
MW-6	99.37	101.65	8.79	92.86
MW-7	99.41	101.89	6.28	95.61
MW-1A	96.29	98.42	4.71	93.71
MW-2A	96.22	98.78	5.28	93.50
MW-3A	95.24	97.98	4.72	93.26
MW-4A	96.26	98.68	3.58	95.10

[1] The bolt on the top of the hydrant to the east of the maintenance shop was assumed to have an elevation of 100.00 feet. The above elevations are computed relative to the assumed bolt elevation.

[2] Groundwater depths obtained on May 3, 1990.

ATTACHMENT 3

SOIL AND GROUNDWATER REPORTS

ENSR

Formerly ERT

DATE: 04/18/90

TO: John Schiffgens

FROM: Bo Blankfield, Laboratory Director

PROJ. NO.: 9500-058-340 LAB NO.: A4035

ENSR Consulting
and Engineering
3000 Richmond Avenue
Houston, Texas 77098
(713) 520-9900
(713) 520-6802 (FAX)

Attached are reports of chemical analyses of samples received April 2, 1990. These analyses are:

Count	Test Code	Test Name	Test Method	Sampled	Matrix
8	BENZ - - -HOU	BENZENE	EPA SW-846: 8020, GC	03/30/90	WATER
8	EB - - -HOU	ETHYL BENZENE	EPA SW-846: 8020, GC	03/30/90	WATER
7	FORM - - -KEM	FORMALDEHYDE	NIOSH #3500	03/30/90	WATER
8	STYRN- - -HOU	STYRENE	EPA SW-846: 8020, GC	03/30/90	WATER
8	TOL - - -HOU	TOLUENE	EPA SW-846: 8020, GC	03/30/90	WATER
8	XYL - - -HOU	XYLENE	EPA SW-846: 8020, GC	03/30/90	WATER

Data contained in this report reflect a full quality control review and have met all applicable standards established by ENSR. ENSR quality assurance protocols are in accordance with EPA guidelines.

Should you have any questions, do not hesitate to contact me at (713) 520-9900.

BB/lis

Enclosures: Analytical Summary, Analytical Report, Chain of Custody, Sample Receipt Checklist, Quality Control Logs, Billing Summary

LAB NO. A4035
PROJECT 9500-058-340 FINA

ENSR

Formerly ERT

SAMPLE DISPOSAL LETTER

ENSR Consulting
and Engineering
3000 Richmond Avenue
Houston, Texas 77098
(713) 520-9900
(713) 520-6802 (FAX)

DATE: 04/18/90

TO: John Schiffgens

FROM: Bo Blankfield, Laboratory Director

PROJ. NO.: 9500-058-340 LAB NO.: A4035 RECEIVED:04/02/90
FINA

It is the policy of ENSR Laboratories to dispose of unanalyzed portions of samples thirty days following submittal of the hard copy data package. Samples from lab number A4035 are due for disposal on May 23, 1990.

Please indicate your preference for disposal below and return this form to Lab Receiving personnel by May 9, 1990. **No response will be interpreted as permission to return the samples on May 23, 1990.**

( )A. ENSR's preferred policy for disposal is to return all remaining samples, including samples not authorized for analysis to the originating site at our expense. This option will be exercised unless this letter is returned with instructions indicating otherwise.

( )B. ENSR will dispose of unused samples, including samples not analyzed, by drumming and transporting by a federally licensed hazardous waste transportation firm at a cost of $5.00/sample. Samples known to be excessively contaminated may be disposed of at a cost of $10.00/sample.

( )C. ENSR will hold your sample at a cost of $15.00/sample per quarter for refrigerated storage or $5.00/sample per quarter for ambient storage. The project will be billed in advance each quarter based upon the number of samples in storage at the beginning of the quarter. The minimum storage fee per project will be $50.00 to cover administrative costs.

Should you have any questions, do not hesitate to contact me at (713) 520-9900.

SIGNATURE: _____

TITLE: _____ DATE: ___/___/___

LAB USE ONLY: DISPOSAL METHOD, DATE, AUTHORIZATION: _____

BB/lis

LAB NO. A4035
PROJECT 9500-058-340 FINA

ENSR Labs—Houston

Analytical Summary
04/18/90 16:49

Lab Number: A4035
Project: 9500-058-340
FINA

Lab ID / *Field ID* / *(Cont.)* / *Test /Matrix*	1 MW4A WATER	2 MW4B WATER	3 MW-7 OLD WATER	4 MW-6 OLD WATER	5 E. B. WATER	6 MW-5 OLD WATER	7 MW-4 OLD WATER	8 T. B. WATER
BENZ - - -HOU	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L
(MDL)	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
EB - - -HOU	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	30 UG/L	<1 UG/L
(MDL)	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
FORM - - -KEM	<0.025 MG/L	0.038 MG/L	0.068 MG/L	0.042 MG/L	0.055 MG/L	0.183 MG/L	0.033 MG/L	--
(MDL)	*(0.025)*	*(0.025)*	*(0.025)*	*(0.025)*	*(0.025)*	*(0.025)*	*(0.025)*	
STYRN- - -HOU	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L
(MDL)	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
TOL - - -HOU	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L
(MDL)	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
XYL - - -HOU	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L	<1 UG/L
(MDL)	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*

QAQC Approval: Dee Davis Date: 4-23-90

Mgr. Approval: [illegible] Date: 4/23/90

ENSR

ENSR Labs—Houston

Analytical Report
04/20/90 14:45

FINA	**Field ID:** MW4A	Date Sampled: 03/30/90
Proj. No.: 9500-058-340	**Lab ID:** 1	Time Sampled: 1420
Lab No.: A4035	**Matrix:** WATER	Date Received: 04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
FORM - - -KEM FORMALDEHYDE NIOSH #3500	<0.025	MG/L	0.025	04/05/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90

ENSR

ENSR Labs-Houston

Analytical Report
04/20/90 14:45

FINA	**Field ID:** MW4B	Date Sampled: 03/30/90
Proj. No.: 9500-058-340	**Lab ID:** 2	Time Sampled: 1430
Lab No.: A4035	**Matrix:** WATER	Date Received: 04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
FORM - - -KEM FORMALDEHYDE NIOSH #3500	0.038	MG/L	0.025	04/05/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90

ENSR Labs-Houston

Analytical Report
04/20/90 14:45

FINA	**Field ID:** MW-7 OLD	Date Sampled: 03/30/90
Proj. No.: 9500-058-340	**Lab ID:** 3	Time Sampled: 1450
Lab No.: A4035	**Matrix:** WATER	Date Received: 04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
FORM - - -KEM FORMALDEHYDE NIOSH #3500	0.068	MG/L	0.025	04/05/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90

ENSR Labs-Houston

Analytical Report
04/20/90 14:45

FINA	Field ID: MW-6 OLD	Date Sampled: 03/30/90
Proj. No.: 9500-058-340	Lab ID: 4	Time Sampled: 1520
Lab No.: A4035	Matrix: WATER	Date Received:04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
FORM - - -KEM FORMALDEHYDE NIOSH #3500	0.042	MG/L	0.025	04/05/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90

ENSR Labs—Houston

Analytical Report
04/20/90 14:45

FINA	Field ID: E. B.	Date Sampled: 03/30/90
Proj. No.: 9500-058-340	Lab ID: 5	Time Sampled: 1535
Lab No.: A4035	Matrix: WATER	Date Received: 04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
FORM - - -KEM FORMALDEHYDE NIOSH #3500	0.055	MG/L	0.025	04/05/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90

ENSR Labs—Houston

Analytical Report
04/20/90 14:45

FINA	Field ID: MW-5 OLD	Date Sampled: 03/30/90
Proj. No.: 9500-058-340	Lab ID: 6	Time Sampled: 1550
Lab No.: A4035	Matrix: WATER	Date Received: 04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
FORM - - -KEM FORMALDEHYDE NIOSH #3500	0.183	MG/L	0.025	04/05/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90

ENSR Labs—Houston

Analytical Report
04/20/90 14:45

FINA	**Field ID:** MW-4 OLD	**Date Sampled:** 03/30/90
Proj. No.: 9500-058-340	**Lab ID:** 7	**Time Sampled:** 1610
Lab No.: A4035	**Matrix:** WATER	**Date Received:** 04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	30	UG/L	1	04/09/90
FORM - - -KEM FORMALDEHYDE NIOSH #3500	0.033	MG/L	0.025	04/05/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/09/90

ENSR Labs-Houston

Analytical Report
04/20/90 14:45

FINA	Field ID: T. B.	Date Sampled: 03/30/90
Proj. No.: 9500-058-340	Lab ID: 8	Time Sampled:
Lab No.: A4035	Matrix: WATER	Date Received: 04/02/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/10/90

ENSR LABORATORIES ©

CONSULTING AND ENGINEERING
2925 RICHMOND AVENUE HOUSTON, TX 77098 (713) 520-1495

Analysis Request and Chain of Custody Record

Project no.	Client/Project Name	Project Location
9500-058-340	FINA	CAL. CITY, IL

Lab ID No	Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Container (Size/Mat'l)	Sample Type (Liquid Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
1	MW4A	3-30-90 1420		(2)	40 ml VOA	H_2O	4°C	BTEX, STYRENE	
1	MW4A	3-30-90 1420		(1)	250 ml AMB	H_2O	4°C	FORMALDEHYDE	
2	MW4B	3-30-90 1430		(2)	40 ml VOA	H_2O	4°C	BTEX, STYRENE	
2	MW4B	3-30-90 1430		(1)	250 ml AMB	H_2O	4°C	FORMALDEHYDE	
3	MW-7 OLD	3-30-90 1450		(2)	40 ml VOA	H_2O	4°C	BTEX, STYRENE	
3	MW-7 OLD	3-30-90 1450		(1)	250 ml AMB	H_2O	4°C	FORMALDEHYDE	
4	MW-6 OLD	3-30-90 1520		(2)	40 ml VOA	H_2O	4°C	BTEX, STYRENE	
4	MW-6 OLD	3-30-90 1520		(1)	250 ml AMB	H_2O	4°C	FORMALDEHYDE	
5	E.B	3-30-90 1535		(2)	40 ml VOA	H_2O	4°C	EQUIP. BLANK	
5	E.B.	3-30-90 1535		(1)	250 ml AMB	H_2O	4°C	EQUIP. BLANK	

Samplers: (Signature)	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	COC Seal No.
Tony Dapper	Tony Dapper	3-30-90 0800	Tony Dapper	3-30-90 1700	34282
Affiliation	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	34283
	Relinquished by: (Signature)	Date: Time:	Received by Laboratory: (Signature) [illegible]	Date: Time: 0855	Intact:

REMARKS:

Data Results To:
1.
2.

Laboratory No. A4035

ENSR LABORATORIES ©

CONSULTING AND ENGINEERING

2925 RICHMOND AVENUE HOUSTON, TX 77098 (713) 520-1495

Analysis Request and Chain of Custody Record

Project no.	Client/Project Name	Project Location
9500-058-340	FINA	CALICITY, IL

Lab ID No	Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Container (Size/Mat'l)	Sample Type (Liquid Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
6	MW5 OLD	3-30-90 1550		(2)	40 ml VOA	H_2O	4°C	BTEX, STYRENE	
6	MW5 OLD	3-30-90 1550		(1)	250 ml AMB	H_2O	4°C	FORMALDEHYDE	
7	MW4 OLD	3-30-90 1610		(2)	40 ml AMB	H_2O	4°C	BTEX, STYRENE * STRONG ODOR	
7	MW4 OLD	3-30-90 1610		1	250 ml AMB	H_2O	4°C	FORMALDEHYDE * STRONG ODOR	
8	T.B	3-30-90		(2)	40 ml VOA	H_2O	4°C	TRIP BLANK - a T.B should be under project # 9500-058-330 per T. Dapper.	
	~~T.B~~ T.R.D	~~3-30-90~~ T.R.D							

Samplers (Signature)	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	COC Seal No.
Tony Dapper	Tony Dapper	3-30-90 0800	Tony Dapper	3-30-90 1700	34282
Affiliation	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	34283
	Relinquished by: (Signature)	Date: Time:	Received by Laboratory: (Signature) [illegible]	Date: [illegible]	Attach [illegible]
			Date Results To: [illegible]		Laboratory No. A4035

REMARKS:

ENSR LABORATORIES ®
SAMPLE RECEIPT CHECKLIST

CLIENT Fma PROJECT NO. 9500-058-340 LAB NO. A 4035

1. ✓ shipped — NOTES: Fedex - 2503918664
   ___ hand-delivered
2. ✓ COC present on receipt — NOTES:
   ___ no COC
3. ✓ COC tape on shipping container — NOTES: 34282 & 34283
   ___ no COC tape
4. ___ samples broken/leaking on receipt — NOTES: Intact
   ✓ samples intact on receipt
   ___ other, see notes
5. ___ ambient on receipt — NOTES:
   ✓ chilled on receipt
6. ✓ samples preserved correctly — NOTES:
   ___ improper preservatives
   ___ N/A, no recommended preservatives
   ___ other, see notes
7. ✓ received within holding times — NOTES:
   ___ not received within holding times
   ___ N/A, no recommended holding time
   ___ other, see notes
8. ___ COC tapes on samples — NOTES:
   ✓ no COC tapes
9. ___ discrepancies between COC and sample labels — NOTES:
   ✓ no discrepancies noted
   ___ N/A, no COC received
   ___ other, see notes

Additional comments:

Samples inspected and logged in by: Julie Hokul Date/Time: 4-2-90 0855

ENSR CONSULTING AND ENGINEERING-HOUSTON LABORATORY
QUALITY CONTROL LOG
SW 846: 8020; BTEX ANALYSIS

LABORATORY NO: A4035

LAB ID	SPIKED AMT(UG)	CALC AMT(UG)	PERCENT RECOVERY (75-125%)
CC040990	30	28.04	93
MB040990	30	25.92	86
1	30	29.06	97
2	30	25.91	86
3	30	30.87	103
4	30	28.96	97
5	30	32.27	108
6	30	32.11	107
7	30	26.86	90
8	30	30.76	103

BLANK ANALYSIS DATE: 4/09/90

NO BTEX DETECTED AT STATED METHOD DETECTION LIMITS

COMMENTS:

Al Berum 4-13-90
ANALYST SIGNATURE

Brenda P. Basile 4/16/90
QAQC COORDINATOR

Summary of QA/QC Results

Date received: 4-MAR-1990 Customer: ENSR Laboratories Job name: M90-04.16

Samples

Keystone ID		16-001	16-002	16-009	16-010
Sampling Point		QA_QC	QA_QC	QA_QC	QA_QC
Customer ID		LAB BLANK	LAB CONTROL SAMPLE	A4035-6 MS	A4035-6 MSD
Parameters	Units				
Formaldehyde	mg/L	<0.025	109 % Rec.	80.5 % Rec.	79.3 % Rec.

ENSR

Formerly ERT

DATE: 04/23/90

TO: John Schiffgens

FROM: Bo Blankfield, Laboratory Director

PROJ. NO.: 9500-058-340 LAB NO.: A4026

ENSR Consulting
and Engineering
3000 Richmond Avenue
Houston, Texas 77098
(713) 520-9900
(713) 520-6802 (FAX)

Attached are reports of chemical analyses of samples received March 29, 1990. These analyses are:

Count	Test Code	Test Name	Test Method	Sampled	Matrix
2	BENZ - - -HOU	BENZENE	EPA SW-846: 8020, GC	03/28/90	WATER
18	BENZ -S- -HOU	BENZENE ON SOLID	EPA SW-846: 8020, GC	03/28/90	CLAY*
					SAND*
					SAND
					SILT*
2	EB - - -HOU	ETHYL BENZENE	EPA SW-846: 8020, GC	03/28/90	WATER
18	EB -S- -HOU	ETHYL BENZENE ON SOLID	EPA SW-846: 8020, GC	03/28/90	CLAY*
					SAND*
					SAND
					SILT*
2	STYRN- - -HOU	STYRENE	EPA SW-846: 8020, GC	03/28/90	WATER
18	STYRN-S- -HOU	STYRENE ON SOLID	EPA SW-846: 8020, GC	03/28/90	CLAY*
					SAND*
					SAND
					SILT*
2	TOL - - -HOU	TOLUENE	EPA SW-846: 8020, GC	03/28/90	WATER
18	TOL -S- -HOU	TOLUENE ON SOLID	EPA SW-846: 8020, GC	03/28/90	CLAY*
					SAND*
					SAND
					SILT*
2	XYL - - -HOU	XYLENE	EPA SW-846: 8020, GC	03/28/90	WATER
18	XYL -S- -HOU	XYLENE ON SOLID	EPA SW-846: 8020, GC	03/28/90	CLAY*
					SAND*
					SAND
					SILT*

Data contained in this report reflect a full quality control review and have met all applicable standards established by ENSR. ENSR quality assurance protocols are in accordance with EPA guidelines.

Should you have any questions, do not hesitate to contact me at (713) 520-9900.

BB/lis

Enclosures: Analytical Summary, Analytical Report, Chain of Custody, Sample Receipt Checklist, Quality Control Logs, Billing Summary

LAB NO. A4026
PROJECT 9500-058-340 FINA

ENSR Labs—Houston

Analytical Summary
04/26/90 13:55

Lab Number: A4026
Project: 9500-058-340
FINA

Lab ID *Field ID* *(Cont.)* *Test /Matrix*	1 14B/1.5-2' CLAY*	2 14B/6.5-7.0' SAND*	3 14B-1/1.5-2' CLAY*	4 14B-1/6.5-7.0' SAND*	5 17A/2.5-2.9' SAND	6 17A/8.5-9' CLAY*	7 17B/2.5-3' CLAY*	8 17B/7-7.5' CLAY*
BENZ -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)*	*(125)**	*(125)**	*(125)**
EB -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)*	*(125)**	*(125)**	*(125)**
STYRN-S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)*	*(125)**	*(125)**	*(125)**
TOL -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)*	*(125)**	*(125)**	*(125)**
XYL -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)*	*(125)**	*(125)**	*(125)**

QAQC Approval: Dee Davis Date: 4-26-90

Mgr. Approval: Brenda P. Laute Date: 4/26/90

* Please see attached Analytical Report for remarks.

***** CONTINUED *****

ENSR

ENSR Labs—Houston

Analytical Summary
04/26/90 13:56

Lab Number: A4026
Project: 9500-058-340
FINA

Lab ID / *Field ID* / *(Cont.)* / *Test /Matrix*	9 16A/3-3.5' CLAY*	10 16A/6.5-7.0' SAND	11 16B/3-3.5' SILT*	12 16B/9-9.5' SAND	13 13A/2-2.5' SAND	14 13A/7.5-8.0' SAND	15 5A/1-1.5' SILT*	16 5A/5.5-6.0' SILT*
BENZ -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)*	*(125)**	*(125)*	*(125)**	*(125)**	*(125)**	*(125)**
EB -S- -HOU	<125 UG/KG	170 UG/KG	7100 UG/KG	330 UG/KG	2500 UG/KG	1900 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)*	*(125)**	*(125)*	*(125)**	*(125)**	*(125)**	*(125)**
STYRN-S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	8500 UG/KG	6700 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)*	*(125)**	*(125)*	*(125)**	*(125)**	*(125)**	*(125)**
TOL -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)*	*(125)**	*(125)*	*(125)**	*(125)**	*(125)**	*(125)**
XYL -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)*	*(125)**	*(125)*	*(125)**	*(125)**	*(125)**	*(125)**

QAQC Approval: Lee Davis Date: 4-26-90

Mgr. Approval: Brenda P. Basile Date: 4/26/90

* Please see attached Analytical Report for remarks.

***** CONTINUED *****

ENSR

ENSR Labs-Houston

Analytical Summary
04/26/90 13:57

Lab Number: A4026
Project: 9500-058-340
FINA

Lab ID *Field ID* *(Cont.)* *Test /Matrix*	17 4A/1-1.5' SILT*	18 4A/5.5-6.0' SILT*	19 TRIP BLANK WATER	20 EQUIP. BLANK WATER
BENZ - - -HOU *(MDL)*	--	--	<1 UG/L *(1)**	<1 UG/L *(1)**
BENZ -S- -HOU *(MDL)*	<125 UG/KG *(125)**	<125 UG/KG *(125)**	--	--
EB - - -HOU *(MDL)*	--	--	<1 UG/L *(1)**	<1 UG/L *(1)**
EB -S- -HOU *(MDL)*	320 UG/KG *(125)**	<125 UG/KG *(125)**	--	--
STYRN- - -HOU *(MDL)*	--	--	<1 UG/L *(1)**	<1 UG/L *(1)**
STYRN-S- -HOU *(MDL)*	<125 UG/KG *(125)**	<125 UG/KG *(125)**	--	--
TOL - - -HOU *(MDL)*	--	--	<1 UG/L *(1)**	<1 UG/L *(1)**
TOL -S- -HOU *(MDL)*	<125 UG/KG *(125)**	<125 UG/KG *(125)**	--	--
XYL - - -HOU *(MDL)*	--	--	<1 UG/L *(1)**	<1 UG/L *(1)**

QAQC Approval: Dee Davis Date: 4-26-90

Mgr. Approval: Brenda P. Daile Date: 4/26/90

* Please see attached Analytical Report for remarks.

***** CONTINUED *****

ENSR

ENSR Labs-Houston

Analytical Summary
04/26/90 13:58

Lab Number: A4026
Project: 9500-058-340
FINA

Lab ID *Field ID* *(Cont.)* *Test /Matrix*	17 4A/1-1.5' SILT*	18 4A/5.5-6.0' SILT*	19 TRIP BLANK WATER	20 EQUIP. BLANK WATER
XYL -S- -HOU	<125 UG/KG	<125 UG/KG	--	--
(MDL)	*(125)**	*(125)**		

QAQC Approval: Dee Davis Date: 4-26-90

Mgr. Approval: Brenda P. Lowe Date: 4/26/90

* Please see attached Analytical Report for remarks.

ENSR

ENSR Labs—Houston

Analytical Report
04/26/90 13:47

FINA	**Field ID:** 14B/1.5-2'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 1	Time Sampled: 1045
Lab No.: A4026	**Matrix:** CLAY*	Date Received: 03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90

*1 *MATRIX CONT.: SILTY CLAY

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ENSR Labs-Houston

Analytical Report
04/26/90 13:47

No.: 9500-058-340	Field ID: 14B/6.5-7.0'	Date Sampled: 03/28/90
No.: A4026	Lab ID: 2	Time Sampled: 1045
	Matrix: SAND*	Date Received: 03/29/90

(Test Code) meter (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
Z -S- -HOU ZENE ON SOLID SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
-S- -HOU YL BENZENE ON SOLID A SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
TYRN-S- -HOU YRENE ON SOLID PA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
OL -S- -HOU OLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90

*1 *MATRIX CONT.: LAYER SAND

ENSR

ENSR Labs—Houston

Analytical Report
04/26/90 13:47

FINA	**Field ID:** 14B-1/1.5-2'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 3	Time Sampled: 1100
Lab No.: A4026	**Matrix:** CLAY*	Date Received:03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.:04/04/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.:04/04/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.:04/04/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.:04/04/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.:04/04/90

*1 *MATRIX CONT.:SILTY CLAY

ENSR

ENSR Labs—Houston

Analytical Report
04/26/90 13:47

FINA	**Field ID:** 14B-1/6.5-7.0'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 4	Time Sampled: 1100
Lab No.: A4026	**Matrix:** SAND*	Date Received: 03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90

*1 *MATRIX CONT.: LAYER SAND

ENSR

ENSR Labs—Houston

Analytical Report
04/26/90 13:47

FINA	**Field ID:** 17A/2.5-2.9'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 5	Time Sampled: 1110
Lab No.: A4026	**Matrix:** SAND	Date Received: 03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90

ENSR Labs—Houston

Analytical Report
04/26/90 13:47

FINA	**Field ID:** 17A/8.5-9'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 6	Time Sampled: 1110
Lab No.: A4026	**Matrix:** CLAY*	Date Received: 03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concentration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/09/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/09/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/09/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/09/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/09/90

*1 *MATRIX CONT.: SILTY CLAY

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 13:47

FINA	**Field ID:** 17B/2.5-3'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 7	Time Sampled: 1125
Lab No.: A4026	**Matrix:** CLAY*	Date Received: 03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90

*1 *MATRIX CONT.: SILTY CLAY

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 13:48

FINA	**Field ID:** 17B/7-7.5'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 8	Time Sampled: 1125
Lab No.: A4026	**Matrix:** CLAY*	Date Received:03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.:04/04/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.:04/04/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.:04/04/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.:04/04/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.:04/04/90

*1 *MATRIX CONT.:SILTY CLAY

ENSR

ENSR Labs—Houston

Analytical Report
04/26/90 13:48

FINA	**Field ID:** 16A/3-3.5'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 9	Time Sampled: 1145
Lab No.: A4026	**Matrix:** CLAY*	Date Received: 03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/04/90 Anal.: 04/04/90

*1 *MATRIX CONT.: SILTY CLAY

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 13:48

FINA	**Field ID:** 16A/6.5-7.0'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 10	Time Sampled: 1145
Lab No.: A4026	**Matrix:** SAND	Date Received:03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	170	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90

ENSR Labs—Houston

Analytical Report
04/26/90 13:48

FINA	**Field ID:** 16B/3-3.5'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	Lab ID: 11	Time Sampled: 1210
Lab No.: A4026	Matrix: SILT*	Date Received: 03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	7100 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90

*1 *MATRIX CONT.: SANDY SILT

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 13:48

FINA	Field ID: 16B/9-9.5'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	Lab ID: 12	Time Sampled: 1210
Lab No.: A4026	Matrix: SAND	Date Received: 03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	330	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90

ENSR Labs—Houston

Analytical Report
04/26/90 13:48

FINA	**Field ID:** 13A/2-2.5'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 13	Time Sampled: 1230
Lab No.: A4026	**Matrix:** SAND	Date Received: 03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	2500 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	8500 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90

*1 *MATRIX CONT.: SILTY SAND

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ENSR Labs-Houston

Analytical Report
04/26/90 13:48

FINA	**Field ID:** 13A/7.5-8.0'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 14	Time Sampled: 1230
Lab No.: A4026	**Matrix:** SAND	Date Received:03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	1900 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	6700 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90

*1 *MATRIX CONT.:SILTY SAND

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 13:48

FINA	Field ID: 5A/1-1.5'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	Lab ID: 15	Time Sampled: 1255
Lab No.: A4026	Matrix: SILT*	Date Received:03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90

*1 *MATRIX CONT.:SANDY SILT

ENSR Labs—Houston

Analytical Report
04/26/90 13:48

FINA	**Field ID:** 5A/5.5-6.0'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 16	Time Sampled: 1255
Lab No.: A4026	**Matrix:** SILT*	Date Received:03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.:04/05/90

*1 *MATRIX CONT.:SANDY SILT

ENSR

ENSR Labs—Houston

Analytical Report
04/26/90 13:49

FINA	**Field ID:** 4A/1-1.5'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 17	Time Sampled: 1320
Lab No.: A4026	**Matrix:** SILT*	Date Received: 03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	320 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/05/90 Anal.: 04/05/90

*1 *MATRIX CONT.: SANDY SILT

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 13:49

FINA	**Field ID:** 4A/5.5-6.0'	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 18	Time Sampled: 1320
Lab No.: A4026	**Matrix:** SILT*	Date Received: 03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/09/90 Anal.: 04/09/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/09/90 Anal.: 04/09/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/09/90 Anal.: 04/09/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/09/90 Anal.: 04/09/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	Ext.: 04/09/90 Anal.: 04/09/90

*1 *MATRIX CONT.: SANDY SILT

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ENSR Labs—Houston

Analytical Report
04/26/90 13:49

FINA	**Field ID:** TRIP BLANK	Date Sampled: 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 19	Time Sampled: 1410
Lab No.: A4026	**Matrix:** WATER	Date Received: 03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1 *1	UG/L	1	Ext.: 04/12/90 Anal.: 04/12/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1 *1	UG/L	1	Ext.: 04/12/90 Anal.: 04/12/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1 *1	UG/L	1	Ext.: 04/12/90 Anal.: 04/12/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1 *1	UG/L	1	Ext.: 04/12/90 Anal.: 04/12/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1 *1	UG/L	1	Ext.: 04/12/90 Anal.: 04/12/90

*1 HOLDING TIME EXPIRED BEFORE ANALYSIS

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 13:49

FINA	**Field ID:** EQUIP. BLANK	**Date Sampled:** 03/28/90
Proj. No.: 9500-058-340	**Lab ID:** 20	Time Sampled: 1320
Lab No.: A4026	**Matrix:** WATER	Date Received: 03/29/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1 *1	UG/L	1	Ext.: 04/05/90 Anal.: 04/05/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1 *1	UG/L	1	Ext.: 04/05/90 Anal.: 04/05/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1 *1	UG/L	1	Ext.: 04/05/90 Anal.: 04/05/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1 *1	UG/L	1	Ext.: 04/05/90 Anal.: 04/05/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1 *1	UG/L	1	Ext.: 04/05/90 Anal.: 04/05/90

*1 HOLDING TIME EXPIRED BEFORE ANALYSIS

ENSR

Formerly ERT

SAMPLE DISPOSAL LETTER

ENSR Consulting
and Engineering
3000 Richmond Avenue
Houston, Texas 77098
(713) 520-9900
(713) 520-6802 (FAX)

DATE: 04/23/90

TO: John Schiffgens

FROM: Bo Blankfield, Laboratory Director

PROJ. NO.: 9500-058-340 FINA LAB NO.: A4026 RECEIVED:03/29/90

It is the policy of ENSR Laboratories to dispose of unanalyzed portions of samples thirty days following submittal of the hard copy data package. Samples from lab number A4026 are due for disposal on May 28, 1990.

Please indicate your preference for disposal below and return this form to Lab Receiving personnel by May 14, 1990. No response will be interpreted as permission to return the samples on May 28, 1990.

( )A. ENSR's preferred policy for disposal is to return all remaining samples, including samples not authorized for analysis to the originating site at our expense. This option will be exercised unless this letter is returned with instructions indicating otherwise.

( )B. ENSR will dispose of unused samples, including samples not analyzed, by drumming and transporting by a federally licensed hazardous waste transportation firm at a cost of $5.00/sample. Samples known to be excessively contaminated may be disposed of at a cost of $10.00/sample.

( )C. ENSR will hold your sample at a cost of $15.00/sample per quarter for refrigerated storage or $5.00/sample per quarter for ambient storage. The project will be billed in advance each quarter based upon the number of samples in storage at the beginning of the quarter. The minimum storage fee per project will be $50.00 to cover administrative costs.

Should you have any questions, do not hesitate to contact me at (713) 520-9900.

SIGNATURE: _____

TITLE: _____ DATE: ___/___/___

LAB USE ONLY: DISPOSAL METHOD, DATE, AUTHORIZATION: _____

BB/lis

LAB NO. A4026
PROJECT 9500-058-340 FINA

ENSR LABORATORIES ©

CONSULTING AND ENGINEERING

2925 RICHMOND AVENUE HOUSTON, TX 77098 (713) 520-1495

Analysis Request and Chain of Custody Record

Project no.: 9500-058-340

Client/Project Name: FINA

Project Location: CALUMET CITY, IL

Lab ID No	Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Container (Size/Mat'l)	Sample Type (Liquid Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
1	14B 1.5-2	3-28-90 1045			120 ml SOIL	SILTY CLAY	4°C	BTEX, STYRENE	
2	14B 6.5-7.0	3-28-90 1045			120 ml SOIL	CLAYEY SAND	4°C	BTEX, STYRENE	
3	14B-1 1.5-2	3-28-90 1100			120 ml SOIL	SILTY CLAY	4°C	BTEX, STYRENE	
4	14B-1 6.5-7.0	3-28-90 1100			120 ml SOIL	CLAYEY SAND	4°C	BTEX, STYRENE	
5	17A 2.5-2.9	3-28-90 1110			120 ml SOIL	SAND	4°C	BTEX, STYRENE	
6	17A 8.5-9	3-28-90 1110			120 ml SOIL	SILTY CLAY	4°C	BTEX, STYRENE	
7	17B 2.5-3	3-28-90 1125			120 ml SOIL	SILTY CLAY	4°C	BTEX, STYRENE	
8	17B 7-7.5	3-28-90 1125			120 ml SOIL	SILTY CLAY	4°C	BTEX, STYRENE	
9	16A 3 to 3.5	3-28-90 1145			120 ml SOIL	SILTY CLAY	4°C	BTEX, STYRENE	
10	16A 6.5-7.0	3-28-90 1145			120 ml SOIL	SAND	4°C	BTEX, STYRENE	

Samplers: (Signature)	Relinquished by: (Signature)	Date: / Time:	Received by: (Signature)	Date: / Time:	COC Seal No.
Tony Dapper	Tony Dapper	3-28-90 0800	Tony Dapper	1700	34289
Affiliation	Relinquished by: (Signature)	Date: / Time:	Received by: (Signature)	Date: / Time:	
	Relinquished by: (Signature)	Date: / Time:	Received by Laboratory: (Signature)	Date: 3-29-90 Time: 1115	Intact:

REMARKS:

Data Results To:
1.
2.

Laboratory No.: A4026

ENSR LABORATORIES ©

CONSULTING AND ENGINEERING

2925 RICHMOND AVENUE HOUSTON, TX 77098 (713) 520-1495

Analysis Request and Chain of Custody Record

Project no. 9500-658-340

Client/Project Name FINA

Project Location CALUMET

Lab ID No	Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Container (Size/Mat'l)	Sample Type (Liquid Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
11	16B 3-3.5	3-28-90 1210			120 ml SOIL	SANDY SILT	4°C	BTEX, STYRENE	
12	16B 9-9.5	3-28-90 1210			120 ml SOIL	SAND	4°C	BTEX, STYRENE	
13	13A 2-2.5	3-28-90 1230			120 ml SOIL	SILTY SAND	4°C	BTEX, STYRENE	
14	13A 7.5-8.0	3-28-90 1230			120 ml SOIL	SILTY SAND	4°C	BTEX, STYRENE	
15	5A 1-1.5	3-28-90 1255			120 ml SOIL	SANDY SILT	4°C	BTEX, STYRENE	
16	5A 5.5-6.0	3-28-90 1255			120 ml SOIL	SANDY SILT	4°C	BTEX, STYRENE	
17	4A 1-1.5	3-28-90 1320			120 ml SOIL	SANDY SILT	4°C	BTEX, STYRENE	
18	4A 5.5-6.0	3-28-90 1320			120 ml SOIL	SANDY SILT	4°C	BTEX, STYRENE	
19		3-28-90 1410			40 ml VOA (VIALS)	H_2O	4°C	(2) TRIP BLANKS	
20		3-28-90 1320			40 ml VOA VIALS	H_2O	4°C	(2) EQUIPMENT BLANKS.	

Samplers: (Signature)	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	COC Seal No.
Tony Dapper	Tony Dapper	3-28-90 0800	Tony Dapper 1700		34284
Affiliation	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	
	Relinquished by: (Signature)	Date: Time:	Received by Laboratory: (Signature)	Date: 3-29-90 Time: 1:15	Intact:

REMARKS:

Data Results To:
1.
2.

Laboratory No. A4026

ENSR LABORATORIES ®
SAMPLE RECEIPT CHECKLIST

CLIENT Tina PROJECT NO. 9500-058-340 LAB NO. A4026

1. ✓ shipped — NOTES: Fedex - 6033366054
   ___ hand-delivered
2. ✓ COC present on receipt — NOTES:
   ___ no COC
3. ✓ COC tape on shipping container — NOTES: #34289
   ___ no COC tape
4. ___ samples broken/leaking on receipt — NOTES: Intact
   ✓ samples intact on receipt
   ___ other, see notes
5. ___ ambient on receipt — NOTES:
   ✓ chilled on receipt
6. ✓ samples preserved correctly — NOTES:
   ___ improper preservatives
   ___ N/A, no recommended preservatives
   ___ other, see notes
7. ✓ received within holding times — NOTES:
   ___ not received within holding times
   ___ N/A, no recommended holding time
   ___ other, see notes
8. ___ COC tapes on samples — NOTES:
   ✓ no COC tapes
9. ___ discrepancies between COC and sample labels — NOTES:
   ✓ no discrepancies noted
   ___ N/A, no COC received
   ___ other, see notes

Additional comments:

Samples inspected and logged in by: Julie Hodnett Date/Time: 3-29-90 1115

ENSR CONSULTING AND ENGINEERING-HOUSTON LABORATORY
QUALITY CONTROL LOG
SW 846: 8020; BTEX ANALYSIS

LABORATORY NO: A4026

LAB ID	SPIKED AMT(UG)	CALC AMT(UG)	PERCENT RECOVERY (75-125%)
CC040590	30	31.59	105
MB040590	30	32.39	108
16	30	35.65	119
16MS	30	29.15	97
16MSD	30	27.56	92
10	30	40.09	134
11	30	37.21	124
12	30	38.37	128
13	30	39.05	130
14	30	36.89	123
15	30	34.01	113
17	30.0	34.47	115
18	30.0	35.66	119
19	30.0	24.12	80
20	30.0	26.29	88
CC040990E1	30.0	28.04	93
MB040990E1	30.0	25.92	86
CC041290	30.0	28.41	95
MB041290	30.0	32.06	107

BLANK ANALYSIS DATE: 4/05/90

NO BTEX DETECTED AT STATED METHOD DETECTION LIMITS

COMMENTS:

4-13-90
ANALYST SIGNATURE

Brenda P. Basille 4/13/90
QAQC COORDINATOR

ENSR CONSULTING AND ENGINEERING-HOUSTON LABORATORY
QUALITY CONTROL LOG
SW 846: 8020; BTEX ANALYSIS

LABORATORY NO: A4026A

LAB ID	SPIKED AMT(UG)	CALC AMT(UG)	PERCENT RECOVERY (75-125%)
CC040490	30	30.30	101
MB040490	30	31.63	105
1	30	36.01	120
2	30	36.69	122
3	30	33.74	112
4	30	37.64	125
5	30	35.92	120
6	30	36.37	121
7	30	37.84	126
8	30	32.95	110
9	30	35.64	119

BLANK ANALYSIS DATE: 4/04/90

NO BTEX DETECTED AT STATED METHOD DETECTION LIMITS

COMMENTS:

Al Berman 4-13-90
ANALYST SIGNATURE

Brenda P. Basile 4/13/90
QAQC COORDINATOR

ENSR CONSULTING AND ENGINEERING-HOUSTON LABORATORY
QUALITY CONTROL LOG-MATRIX SPIKE
SW 846: 8020; BTEX ANALYSES

N LABORATORY NO: A4026

MATRIX SPIKE RECOVERIES SAMPLE: 16

ANALYTE	SPIKE (UG/L)	SAMPLE (UG/L)	CONC MS	% REC	CONC MSD	% REC	RPD	QC LIMITS % REC
BENZENE	20	0	20	101	25	123	-20	39-150
TOLUENE	20	0	18	92	21	106	-14	46-148
ETHYLBENZENE	20	0	19	94	21	107	-13	32-160
TOTAL XYLENES	20	0	18	92	20	101	-9	35-150

COMMENTS:

AL Berman 4-12-90
ANALYST SIGNATURE DATE

Brenda P. Basile 4/12/90
QAQC COORDINATOR DATE

ENSR

Formerly ERT

DATE: 04/25/90

TO: John Schiffgens

FROM: Bo Blankfield, Laboratory Director

PROJ. NO.: 9500-058-260 LAB NO.: A4017

ENSR Consulting
and Engineering
3000 Richmond Avenue
Houston, Texas 77098
(713) 520-9900
(713) 520-6802 (FAX)

Attached are reports of chemical analyses of samples received March 28, 1990. These analyses are:

Count	Test Code	Test Name	Test Method	Sampled	Matrix
2	BENZ - - -HOU	BENZENE	EPA SW-846: 8020, GC	03/27/90	LIQUID
12	BENZ -S- -HOU	BENZENE ON SOLID	EPA SW-846: 8020, GC	03/27/90	SOLID*
					SAND*
					CLAY*
					SILT*
					CLAY
					SAND
2	EB - - -HOU	ETHYL BENZENE	EPA SW-846: 8020, GC	03/27/90	LIQUID
12	EB -S- -HOU	ETHYL BENZENE ON SOLID	EPA SW-846: 8020, GC	03/27/90	SOLID*
					SAND*
					CLAY*
					SILT*
					CLAY
					SAND
2	FORM -S- -KEM	FORMALDEHYDE	NIOSH #3500	03/27/90	SOLID*
2	STYRN- - -HOU	STYRENE	EPA SW-846: 8020, GC	03/27/90	LIQUID
12	STYRN-S- -HOU	STYRENE ON SOLID	EPA SW-846: 8020, GC	03/27/90	SOLID*
					SAND*
					CLAY*
					SILT*
					CLAY
					SAND
2	TOL - - -HOU	TOLUENE	EPA SW-846: 8020, GC	03/27/90	LIQUID
12	TOL -S- -HOU	TOLUENE ON SOLID	EPA SW-846: 8020, GC	03/27/90	SOLID*
					SAND*
					CLAY*
					SILT*
					CLAY
					SAND
2	XYL - - -HOU	XYLENE	EPA SW-846: 8020, GC	03/27/90	LIQUID
12	XYL -S- -HOU	XYLENE ON SOLID	EPA SW-846: 8020, GC	03/27/90	SOLID*
					SAND*

LAB NO. A4017 CONT.

CLAY*

SILT*
CLAY
SAND

Data contained in this report reflect a full quality control review and have met all applicable standards established by ENSR. ENSR quality assurance protocols are in accordance with EPA guidelines.

Should you have any questions, do not hesitate to contact me at (713) 520-9900.

BB/lis

Enclosures: Analytical Summary, Analytical Report, Chain of Custody, Sample Receipt Checklist, Quality Control Logs, Billing Summary

LAB NO. A4017
PROJECT 9500-058-260 FINA

ENSR Labs—Houston

Analytical Summary
04/25/90 14:21

Lab Number: A4017
Project: 9500-058-260
FINA

Lab ID *Field ID* *(Cont.)* *Test /Matrix*	1 MW-4A, 1-3' SOLID*	2 MW-4A, 6-7' SOLID*	3 15-A, 3.5-4.0' SAND*	4 15-A, 8-9' SOLID*	5 15-B, 1.5-2' CLAY*	6 15-B, 4-4.5' SAND*	7 10-A, 2.5-3.0' SOLID*	8 10-A, 8-8.5' SILT*
BENZ -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**
EB -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	470 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**
FORM -S- -KEM	0.125 MG/KG*	<0.100 MG/KG	--	--	--	--	--	--
(MDL)	*(0.100)**	*(0.100)**						
STYRN-S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**
TOL -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**
XYL -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG
(MDL)	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**	*(125)**

QAQC Approval: Da Davis Date: 4-25-90

Mgr. Approval: Brenda P. Brooks Date: 4/25/90

* Please see attached Analytical Report for remarks.

***** CONTINUED *****

ENSR

ENSR Labs-Houston

Analytical Summary
04/25/90 14:22

Lab Number: A4017
Project: 9500-058-260
FINA

Lab ID *Field ID* *(Cont.)* *Test /Matrix*	9 10-B, 3-3.5' SILT*	10 10-B, 8-8.5' CLAY	11 14-A, 3.5-4.0' SAND	12 14-A, 7.5-8.0' SILT*	13 TRIP BLANK LIQUID	14 EQUIPMENT BLANKS LIQUID
BENZ - - -HOU *(MDL)*	--	--	--	--	<1 UG/L *(1)*	<1 UG/L *(1)*
BENZ -S- -HOU *(MDL)*	140 UG/KG *(125)**	<125 UG/KG *(125)*	<125 UG/KG *(125)*	<125 UG/KG *(125)**	--	--
EB - - -HOU *(MDL)*	--	--	--	--	<1 UG/L *(1)*	<1 UG/L *(1)*
EB -S- -HOU *(MDL)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	<125 UG/KG *(125)*	<125 UG/KG *(125)**	--	--
STYRN- - -HOU *(MDL)*	--	--	--	--	<1 UG/L *(1)*	<1 UG/L *(1)*
STYRN-S- -HOU *(MDL)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	<125 UG/KG *(125)*	<125 UG/KG *(125)**	--	--
TOL - - -HOU *(MDL)*	--	--	--	--	<1 UG/L *(1)*	<1 UG/L *(1)*
TOL -S- -HOU *(MDL)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	<125 UG/KG *(125)*	<125 UG/KG *(125)**	--	--
XYL - - -HOU *(MDL)*	--	--	--	--	<1 UG/L *(1)*	<1 UG/L *(1)*

QAQC Approval: Dee Davis Date: 4-25-90

Mgr. Approval: Ronda P. Davis Date: 4/25/90

* Please see attached Analytical Report for remarks.

***** CONTINUED *****

ENSR

ENSR Labs-Houston

Analytical Summary
04/25/90 14:23

Lab Number: A4017
Project: 9500-058-260
FINA

Lab ID *Field ID* *(Cont.)* *Test /Matrix*	9 10-B, 3-3.5' SILT*	10 10-B, 8-8.5' CLAY	11 14-A, 3.5-4.0' SAND	12 14-A, 7.5-8.0' SILT*	13 TRIP BLANK LIQUID	14 EQUIPMENT BLANKS LIQUID
XYL -S- -HOU *(MDL)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	<125 UG/KG *(125)*	<125 UG/KG *(125)**	--	--

QAQC Approval: Dee Davis Date: 4-25-90

Mgr. Approval: Brenda F. Fowler Date: 4/25/90

* Please see attached Analytical Report for remarks.

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 10:25

FINA	Field ID: MW-4A, 1-3'	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	Lab ID: 1	Time Sampled: 910
Lab No.: A4017	Matrix: SOLID*	Date Received: 03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
FORM -S- -KEM FORMALDEHYDE NIOSH #3500	0.125 *1,2	MG/KG*	0.100	04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90

*1 *MATRIX CONT.: SANDY
*2 *WET WEIGHT BASIS

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 10:25

FINA	Field ID: MW-4A, 6-7'	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	Lab ID: 2	Time Sampled: 920
Lab No.: A4017	Matrix: SOLID*	Date Received: 03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
FORM -S- -KEM FORMALDEHYDE NIOSH #3500	<0.100 *1	MG/KG	0.100	04/05/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90

*1 *MATRIX CONT.: SANDY

ENSR

ENSR Labs—Houston

Analytical Report
04/26/90 10:25

FINA	Field ID: 15-A, 3.5-4.0'	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	Lab ID: 3	Time Sampled: 1000
Lab No.: A4017	Matrix: SAND*	Date Received: 03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90

*1 *MATRIX CONT.:SILTY SAND

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 10:26

FINA	Field ID: 15-A, 8-9'	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	Lab ID: 4	Time Sampled: 1005
Lab No.: A4017	Matrix: SOLID*	Date Received: 03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90

*1 *MATRIX CONT.: SANDY

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 10:26

FINA	**Field ID:** 15-B, 1.5-2'	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	**Lab ID:** 5	Time Sampled: 1015
Lab No.: A4017	**Matrix:** CLAY*	Date Received:03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90

*1 *MATRIX CONT.:SILTY CLAY

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 10:26

FINA	**Field ID:** 15-B, 4-4.5'	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	**Lab ID:** 6	Time Sampled: 1015
Lab No.: A4017	**Matrix:** SAND*	Date Received:03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	470 *1	UG/KG	125	04/02/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90

*1 *MATRIX CONT.:SILTY SAND

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 10:26

FINA	Field ID: 10-A, 2.5-3.0'	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	Lab ID: 7	Time Sampled: 1035
Lab No.: A4017	Matrix: SOLID*	Date Received:03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90

*1 *MATRIX CONT.:SANDY

ENSR

ENSR Labs—Houston

Analytical Report
04/26/90 10:26

FINA	**Field ID:** 10-A, 8-8.5'	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	**Lab ID:** 8	Time Sampled: 1035
Lab No.: A4017	**Matrix:** SILT*	Date Received:03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/03/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/03/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/03/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/03/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/03/90

*1 *MATRIX CONT.:SANDY SILT

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ENSR Labs-Houston

Analytical Report
04/26/90 10:26

FINA	**Field ID:** 10-B, 3-3.5'	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	Lab ID: 9	Time Sampled: 1100
Lab No.: A4017	Matrix: SILT*	Date Received:03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	140 *1	UG/KG	125	04/02/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90

*1 *MATRIX CONT.:SANDY SILT

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 10:26

FINA	Field ID: 10-B, 8-8.5'	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	Lab ID: 10	Time Sampled: 1100
Lab No.: A4017	Matrix: CLAY	Date Received:03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/02/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/02/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/02/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/02/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/02/90

ENSR Labs-Houston

Analytical Report
04/26/90 10:26

FINA	**Field ID:** 14-A, 3.5-4.0'	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	**Lab ID:** 11	Time Sampled: 1315
Lab No.: A4017	**Matrix:** SAND	Date Received: 03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/10/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/10/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/10/90
TOL -S- -HOU *TOLUENE ON SOLID* EPA SW-846: 8020, GC	<125	UG/KG	125	04/10/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/10/90

ENSR Labs-Houston

Analytical Report
04/26/90 10:26

FINA	Field ID: 14-A, 7.5-8.0'	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	Lab ID: 12	Time Sampled: 1315
Lab No.: A4017	Matrix: SILT*	Date Received: 03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/02/90

*1 *MATRIX CONT.:SANDY SILT

ENSR Labs-Houston

Analytical Report
04/26/90 10:27

FINA	**Field ID:** TRIP BLANK	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	**Lab ID:** 13	Time Sampled:
Lab No.: A4017	**Matrix:** LIQUID	Date Received:03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/02/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/02/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/02/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/02/90
XYL - - -HOU XYLENE . EPA SW-846: 8020, GC	<1	UG/L	1	04/02/90

ENSR

ENSR Labs-Houston

Analytical Report
04/26/90 10:27

FINA	**Field ID:** EQUIPMENT BLANKS	Date Sampled: 03/27/90
Proj. No.: 9500-058-260	**Lab ID:** 14	Time Sampled:
Lab No.: A4017	**Matrix:** LIQUID	Date Received:03/28/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/02/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/02/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/02/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/02/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/02/90

ENSR

Formerly ERT

SAMPLE DISPOSAL LETTER

ENSR Consulting
and Engineering
3000 Richmond Avenue
Houston, Texas 77098
(713) 520-9900
(713) 520-6802 (FAX)

DATE: 04/25/90

TO: John Schiffgens

FROM: Bo Blankfield, Laboratory Director

PROJ. NO.: 9500-058-260 LAB NO.: A4017 RECEIVED:03/28/90
FINA

It is the policy of ENSR Laboratories to dispose of unanalyzed portions of samples thirty days following submittal of the hard copy data package. Samples from lab number A4017 are due for disposal on May 28, 1990.

Please indicate your preference for disposal below and return this form to Lab Receiving personnel by May 14, 1990. No response will be interpreted as permission to return the samples on May 28, 1990.

( )A. ENSR's preferred policy for disposal is to return all remaining samples, including samples not authorized for analysis to the originating site at our expense. This option will be exercised unless this letter is returned with instructions indicating otherwise.

( )B. ENSR will dispose of unused samples, including samples not analyzed, by drumming and transporting by a federally licensed hazardous waste transportation firm at a cost of $5.00/sample. Samples known to be excessively contaminated may be disposed of at a cost of $10.00/sample.

( )C. ENSR will hold your sample at a cost of $15.00/sample per quarter for refrigerated storage or $5.00/sample per quarter for ambient storage. The project will be billed in advance each quarter based upon the number of samples in storage at the beginning of the quarter. The minimum storage fee per project will be $50.00 to cover administrative costs.

Should you have any questions, do not hesitate to contact me at (713) 520-9900.

SIGNATURE: _____

TITLE: _____ DATE: ___/___/___

LAB USE ONLY: DISPOSAL METHOD, DATE, AUTHORIZATION: _____

BB/lis

LAB NO. A4017
PROJECT 9500-058-260 FINA

ENSR LABORATORIES ©

CONSULTING AND ENGINEERING

2925 RICHMOND AVENUE HOUSTON, TX 77098 (713) 520-1495

Analysis Request and Chain of Custody Record

Project no.: 9500-058-260

Client/Project Name: FINA

Project Location: CALUMET CITY, IL.

Lab ID No	Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Container (Size/Mat'l)	Sample Type (Liquid Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
1	MW4A 1'to3'	3-27-90 0910			120 ml SOIL	SANDY	4°C	BTEX, STYRENE	
↓	MW4A 1'to3'	3-27-90 0910			120 ml (AMB) SOIL	SANDY	4°C	FORMALDEHYDE	
2	MW4A 6'to7'	3-27-90 0920			120 ml SOIL	SANDY	4°C	BTEX, STYRENE	
↓	MW4A 6'to7'	3-27-90 0920			120 ml SOIL (AMB)	SANDY	4°C	FORMALDEHYDE	
3	15-A 3.5to4.0	3-27-90 1000			120 ml SOIL	SILTY SAND	4°C	BTEX, STYRENE	
4	15-A 8to9	3-27-90 1005			120 ml SOIL	SANDY	4°C	BTEX, STYRENE	
5	15-B 1.5to2	3-27-90 1015			120 ml SOIL	SILTY CLAY	4°C	BTEX, STYRENE	
6	15-B 4to4.5	3-27-90 1015			120 ml SOIL	SILTY SAND	4°C	BTEX, STYRENE * Petroleum odor	
7	10-A 2.5-3.0	3-27-90 1035			120 ml SOIL	SANDY	4°C	BTEX, STYRENE	
8	10-A 8-8.5	3-27-90 1035			120 ml SOIL	SANDY SILT	4°C	BTEX, STYRENE	

Samplers: (Signature)	Relinquished by: (Signature)	Date: 3-27-90 Time: 0800	Received by: (Signature)	Date: 3-27-90 Time: 1540	COC Seal No.
Tony Dapper	Tony Dapper		Tony Dapper		34285
Affiliation	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	
ENSR C&E					
	Relinquished by: (Signature)	Date: Time:	Received by Laboratory: (Signature) Alma Lowe	Date: 3-28-90 Time: 1105	Intact:

REMARKS:

Data Results To:
1.
2.

Laboratory No.: A4017

ENSR LABORATORIES ©

CONSULTING AND ENGINEERING

2925 RICHMOND AVENUE HOUSTON, TX 77098 (713) 520-1495

Analysis Request and Chain of Custody Record

Project no.: 9500-058-260

Client/Project Name: FINA

Project Location: CALUMET CITY, IL

Lab ID No	Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Container (Size/Mat'l)	Sample Type (Liquid Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
9	10-B 3 to 3.5	3-27-90 1100			120ml SOIL	SANDY SILT	4°C	BTEX, STYRENE	
10	10-B 8 to 8.5	3-27-90 1100			120ml SOIL	CLAY	4°C	BTEX, STYRENE	
11	14-A 3.5 to 4.0	3-27-90 1315			120ml SOIL	SAND	4°C	BTEX, STYRENE	
12	14-A 7.5 to 8.0	3-27-90 1315			120ml SOIL	SANDY SILT	4°C	BTEX, STYRENE	
13		3-27-90			40 ml VIALS		4°C	(2) TRIP BLANKS	
14		3-27-90			40 ml VIALS		4°C	(2) EQUIPMENT BLANKS	

Samplers: (Signature)

Affiliation

Relinquished by: (Signature) Tony Dapper — Date: 3-27-90 Time: 0800

Received by: (Signature) Tony Dapper — Date: 3-27-90 Time: 1540

COC Seal No.: 34285

Relinquished by: (Signature) — Date: Time:

Received by: (Signature) — Date: Time:

Relinquished by: (Signature) — Date: Time:

Received by Laboratory: (Signature) [illegible] — Date: 3-28-90 Time: 1105

Intact: Yes

REMARKS:

Data Results To:
1.
2.

Laboratory No.: A4017

ENSR LABORATORIES ®
SAMPLE RECEIPT CHECKLIST

CLIENT Fina PROJECT NO. 9500-058-260 LAB NO. A4017

1. X shipped — NOTES: Federal Express #2503918675
   ____ hand-delivered
2. X COC present on receipt — NOTES:
   ____ no COC
3. X COC tape on shipping container — NOTES: Tape Intact
   ____ no COC tape
4. ____ samples broken/leaking on receipt — NOTES:
   X samples intact on receipt
   ____ other, see notes
5. ____ ambient on receipt — NOTES:
   X chilled on receipt
6. ____ samples preserved correctly — NOTES:
   ____ improper preservatives
   X N/A, no recommended preservatives
   ____ other, see notes
7. X received within holding times — NOTES:
   ____ not received within holding times
   ____ N/A, no recommended holding time
   ____ other, see notes
8. ____ COC tapes on samples — NOTES:
   X no COC tapes
9. ____ discrepancies between COC and sample labels — NOTES:
   X no discrepancies noted
   ____ N/A, no COC received
   ____ other, see notes

Additional comments:

Samples inspected and logged in by: Thelma Lowe Date/Time: 3/28/90 1105

ENSR CONSULTING AND ENGINEERING-HOUSTON LABORATORY
QUALITY CONTROL LOG-MATRIX SPIKE
SW 846: 8020; BTEX ANALYSES

N LABORATORY NO: A4017

MATRIX SPIKE RECOVERIES SAMPLE: 4

ANALYTE	SPIKE (UG/L)	SAMPLE (UG/L)	CONC MS	% REC	CONC MSD	% REC	RPD	QC LIMITS % REC	RPD
BENZENE	20	0	24	122	26	132	-8	39-150	15
TOLUENE	20	0	25	125	26	131	-5	46-148	15
ETHYLBENZENE	20	0	21	107	22	112	-5	32-160	15
TOTAL XYLENES	20	0	21	104	22	110	-5	35-150	15

COMMENTS:

4-10-90
ANALYST SIGNATURE DATE

4/11/90
QAQC COORDINATOR DATE

ENSR CONSULTING AND ENGINEERING-HOUSTON LABORATORY
QUALITY CONTROL LOG
SW 846: 8020; BTEX ANALYSIS

LABORATORY NO: A4017

LAB ID	SPIKED AMT(UG)	CALC AMT(UG)	PERCENT RECOVERY (75-125%)
CC040290	30	29.56	99
MB040290	30	30.09	100
4	30	35.86	120
4MS	30	32.48	108
4MSD	30	31.00	103
1	30	36.67	122
2	30	36.53	122
3	30	32.97	110
5	30	33.12	110
6	30	45.41	151
7	30	32.07	107
8	30.0	28.90	96
9	30.0	41.73	139
10	30.0	32.50	108
11	30.0	36.44	121
12	30.0	39.27	131
13	30.0	25.84	86
14	30.0	26.98	90
CC040490	30.0	30.30	101
MB040490	30.0	31.63	105
CC041099	30.0	27.24	91
MB041090E1	30.0	33.62	112

BLANK ANALYSIS DATE: 4/02/90

NO BTEX DETECTED AT STATED METHOD DETECTION LIMITS

COMMENTS:

A.C. Berman 4-11-90

ANALYST SIGNATURE DATE

Brenda R. Fasile 4/11/90

QAQC COORDINATOR DATE

Summary of QA/QC Results

Date received: 28-MAR-1990 Customer: ENSR Laboratories Job name: M90-03.155

		Samples						
Keystone ID		155-001	155-002	155-004	155-005	155-006	155-015	155-016
Sampling Point		QA_QC	QA_QC	QA_QC	QA_QC	QA_QC	QA_QC	QA_QC
Customer ID		LAB BLANK	LAB CONTROL SAMPLE	A4003-1 DUP	A4003-1 MS	A4003-1 MSD	A4004-3 MS	A4004-3 MSD
Parameters	Units							
%Solids at 103°C	%	NR	NR	72.8	NR	NR	NR	NR
Formaldehyde	mg/L	0.025	109 % Rec.	NR	78.8 % Rec.	95.9 % Rec.	92.8 % Rec.	92.8 % Rec.

ENSR

Formerly ERT

DATE: 05/08/90

TO: John Schiffgens

FROM: Bo Blankfield, Laboratory Director

PROJ. NO.: 9500-058-340 LAB NO.: A4101

ENSR Consulting
and Engineering
3000 Richmond Avenue
Houston, Texas 77098
(713) 520-9900
(713) 520-6802 (FAX)

Attached are reports of chemical analyses of samples received April 13, 1990. These analyses are:

Count	Test Code	Test Name	Test Method	Sampled	Matrix
3	BENZ - - -HOU	BENZENE	EPA SW-846: 8020, GC	04/12/90	WATER
6	BENZ -S- -HOU	BENZENE ON SOLID	EPA SW-846: 8020, GC	04/12/90	CLAY*
					CLAY
					SAND*
					SAND
3	EB - - -HOU	ETHYL BENZENE	EPA SW-846: 8020, GC	04/12/90	WATER
6	EB -S- -HOU	ETHYL BENZENE ON SOLID	EPA SW-846: 8020, GC	04/12/90	CLAY*
					CLAY
					SAND*
					SAND
1	FORM - - -KEM	FORMALDEHYDE	NIOSH #3500	04/12/90	WATER
3	STYRN- - -HOU	STYRENE	EPA SW-846: 8020, GC	04/12/90	WATER
6	STYRN-S- -HOU	STYRENE ON SOLID	EPA SW-846: 8020, GC	04/12/90	CLAY*
					CLAY
					SAND*
					SAND
3	TOL - - -HOU	TOLUENE	EPA SW-846: 8020, GC	04/12/90	WATER
6	TOL -S- -HOU	TOLUENE ON SOLID	EPA SW-846: 8020, GC	04/12/90	CLAY*
					CLAY
					SAND*
					SAND
3	XYL - - -HOU	XYLENE	EPA SW-846: 8020, GC	04/12/90	WATER
6	XYL -S- -HOU	XYLENE ON SOLID	EPA SW-846: 8020, GC	04/12/90	CLAY*
					CLAY
					SAND*
					SAND

Data contained in this report reflect a full quality control review and have met all applicable standards established by ENSR. ENSR quality assurance protocols are in accordance with EPA guidelines.

Should you have any questions, do not hesitate to contact me at (713) 520-9900.

LAB NO. A4101 CONT.

BB/lis

Enclosures: Analytical Summary, Analytical Report, Chain of Custody, Sample Receipt Checklist, Quality Control Logs, Billing Summary

LAB NO. A4101
PROJECT 9500-058-340 FINA

ENSR

Formerly ERT

SAMPLE DISPOSAL LETTER

ENSR Consulting
and Engineering
3000 Richmond Avenue
Houston, Texas 77098
(713) 520-9900
(713) 520-6802 (FAX)

DATE: 05/08/90

TO: John Schiffgens

FROM: Bo Blankfield, Laboratory Director

PROJ. NO.: 9500-058-340 LAB NO.: A4101 RECEIVED:04/13/90
FINA

It is the policy of ENSR Laboratories to dispose of unanalyzed portions of samples thirty days following submittal of the hard copy data package. Samples from lab number A4101 are due for disposal on June 12, 1990.

Please indicate your preference for disposal below and return this form to Lab Receiving personnel by May 29, 1990. No response will be interpreted as permission to return the samples on June 12, 1990.

( )A. ENSR's preferred policy for disposal is to return all remaining samples, including samples not authorized for analysis to the originating site at our expense. This option will be exercised unless this letter is returned with instructions indicating otherwise.

( )B. ENSR will dispose of unused samples, including samples not analyzed, by drumming and transporting by a federally licensed hazardous waste transportation firm at a cost of $5.00/sample. Samples known to be excessively contaminated may be disposed of at a cost of $10.00/sample.

( )C. ENSR will hold your sample at a cost of $15.00/sample per quarter for refrigerated storage or $5.00/sample per quarter for ambient storage. The project will be billed in advance each quarter based upon the number of samples in storage at the beginning of the quarter. The minimum storage fee per project will be $50.00 to cover administrative costs.

Should you have any questions, do not hesitate to contact me at (713) 520-9900.

SIGNATURE: _____

TITLE: _____ DATE: ___/___/___

LAB USE ONLY: DISPOSAL METHOD, DATE, AUTHORIZATION: _____

BB/lis

LAB NO. A4101
PROJECT 9500-058-340 FINA

ENSR Labs—Houston

Analytical Summary
05/08/90 11:33

Lab Number: A4101
Project: 9500-058-340
FINA

Lab ID *Field ID* *(Cont.)* *Test /Matrix*	1 12A/1.5-2.0' CLAY*	2 12A/5-6' CLAY	3 11A/2.5-3.0' SAND*	4 11A/4.5-5.0' SAND	5 11B/2.5-3.0' SAND*	6 11B/4.5-5.0' SAND	7 MW3 OLD WATER	8 T.B. WATER
BENZ - - -HOU *(MDL)*	--	--	--	--	--	--	<1 UG/L *(1)*	<1 UG/L *(1)*
BENZ -S- -HOU *(MDL)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	--	--
EB - - -HOU *(MDL)*	--	--	--	--	--	--	<1 UG/L *(1)*	<1 UG/L *(1)*
EB -S- -HOU *(MDL)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	--	--
FORM - - -KEM *(MDL)*	--	--	--	--	--	--	0.439 MG/L *()*	--
STYRN- - -HOU *(MDL)*	--	--	--	--	--	--	<1 UG/L *(1)*	<1 UG/L *(1)*
STYRN-S- -HOU *(MDL)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	--	--
TOL - - -HOU *(MDL)*	--	--	--	--	--	--	<1 UG/L *(1)*	<1 UG/L *(1)*
TOL -S- -HOU *(MDL)*	440 UG/KG *(125)**	<125 UG/KG *(125)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	<125 UG/KG *(125)**	<125 UG/KG *(125)*	--	--

QAQC Approval: Joan M. Hoese Date: 5/8/90

Mgr. Approval: [signature] Date: 5-8-90

* Please see attached Analytical Report for remarks.

***** CONTINUED *****

ENSR

ENSR Labs-Houston

Analytical Summary
05/08/90 11:34

Lab Number: A4101
Project: 9500-058-340
FINA

Lab ID *Field ID* *(Cont.)* *Test /Matrix*	1 12A/1.5-2.0' CLAY*	2 12A/5-6' CLAY	3 11A/2.5-3.0' SAND*	4 11A/4.5-5.0' SAND	5 11B/2.5-3.0' SAND*	6 11B/4.5-5.0' SAND	7 MW3 OLD WATER	8 T.B. WATER
XYL - - -HOU	--	--	--	--	--	--	<1 UG/L	<1 UG/L
(MDL)							*(1)*	*(1)*
XYL -S- -HOU	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	<125 UG/KG	--	--
(MDL)	*(125)**	*(125)*	*(125)**	*(125)*	*(125)**	*(125)*		

QAQC Approval: Joann L. Hood Date: 5/8/90

Mgr. Approval: [illegible] Date: 5-8-90

* Please see attached Analytical Report for remarks.

***** CONTINUED *****

ENSR

ENSR Labs-Houston

Analytical Summary
05/08/90 11:34

Lab Number: A4101 *Project:* 9500-058-340 FINA	
Lab ID *Field ID* *Test /Matrix*	9 F.B. WATER
BENZ - - -HOU *(MDL)*	<1 UG/L *(1)*
EB - - -HOU *(MDL)*	<1 UG/L *(1)*
STYRN- - -HOU *(MDL)*	<1 UG/L *(1)*
TOL - - -HOU *(MDL)*	1.1 UG/L *(1)*
XYL - - -HOU *(MDL)*	<1 UG/L *(1)*

QAQC Approval: Joann M. Hood Date: 5/8/90

Mgr. Approval: [illegible] Date: 5-8-90

ENSR

ENSR Labs-Houston

Analytical Report
05/08/90 11:35

FINA	**Field ID:** 12A/1.5-2.0'	Date Sampled: 04/12/90
Proj. No.: 9500-058-340	**Lab ID:** 1	Time Sampled: 1000
Lab No.: A4101	**Matrix:** CLAY* (GRAB)	Date Received:04/13/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90
EB -S- -HOU *ETHYL BENZENE ON SOLID* EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	440 *1	UG/KG	125	04/20/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90

*1 *MATRIX CONT.:SILTY

ENSR

ENSR Labs-Houston

Analytical Report
05/08/90 11:35

FINA	**Field ID:** 12A/5-6'	Date Sampled: 04/12/90
Proj. No.: 9500-058-340	**Lab ID:** 2	Time Sampled: 1000
Lab No.: A4101	**Matrix:** CLAY (GRAB)	Date Received:04/13/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90

ENSR Labs-Houston

Analytical Report
05/08/90 11:35

FINA	*Field ID:* 11A/2.5-3.0'	*Date Sampled:* 04/12/90
Proj. No.: 9500-058-340	Lab ID: 3	Time Sampled: 1045
Lab No.: A4101	Matrix: SAND* (GRAB)	Date Received: 04/13/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90

*1 *MATRIX CONT.:SILTY

ENSR Labs—Houston

Analytical Report
05/08/90 11:35

FINA	**Field ID:** 11A/4.5-5.0'	Date Sampled: 04/12/90
Proj. No.: 9500-058-340	**Lab ID:** 4	Time Sampled: 1045
Lab No.: A4101	**Matrix:** SAND (GRAB)	Date Received: 04/13/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90

ENSR Labs-Houston

Analytical Report
05/08/90 11:35

FINA	Field ID: 11B/2.5-3.0'	Date Sampled: 04/12/90
Proj. No.: 9500-058-340	Lab ID: 5	Time Sampled: 1130
Lab No.: A4101	Matrix: SAND* (GRAB)	Date Received: 04/13/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125 *1	UG/KG	125	04/20/90

*1 *MATRIX CONT.:SILTY

ENSR

ENSR Labs-Houston

Analytical Report
05/08/90 11:35

FINA	Field ID: 11B/4.5-5.0'	Date Sampled: 04/12/90
Proj. No.: 9500-058-340	Lab ID: 6	Time Sampled: 1130
Lab No.: A4101	Matrix: SAND (GRAB)	Date Received: 04/13/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ -S- -HOU BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90
EB -S- -HOU ETHYL BENZENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90
STYRN-S- -HOU STYRENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90
TOL -S- -HOU TOLUENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90
XYL -S- -HOU XYLENE ON SOLID EPA SW-846: 8020, GC	<125	UG/KG	125	04/20/90

ENSR Labs-Houston

Analytical Report
05/08/90 11:35

FINA	**Field ID:** MW3 OLD	Date Sampled: 04/12/90
Proj. No.: 9500-058-340	**Lab ID:** 7	Time Sampled: 1220
Lab No.: A4101	**Matrix:** WATER (GRAB)	Date Received: 04/13/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/20/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/20/90
FORM - - -KEM FORMALDEHYDE NIOSH #3500	0.439	MG/L		04/18/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/20/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/20/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/20/90

ENSR Labs-Houston

Analytical Report
05/08/90 11:35

FINA	Field ID: T.B.	Date Sampled: 04/12/90
Proj. No.: 9500-058-340	Lab ID: 8	Time Sampled:
Lab No.: A4101	Matrix: WATER (GRAB)	Date Received:04/13/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/20/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/20/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/20/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	<1	UG/L	1	04/20/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/20/90

ENSR Labs-Houston

Analytical Report
05/08/90 11:35

FINA	**Field ID:** F.B.	Date Sampled: 04/12/90
Proj. No.: 9500-058-340	**Lab ID:** 9	Time Sampled:
Lab No.: A4101	**Matrix:** WATER (GRAB)	Date Received: 04/13/90

Parameter (Test Code) (Test Name) (Test Method)	Concen-tration	Units	Method Detection Limit	Date/Time Analysis Performed
BENZ - - -HOU BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/25/90
EB - - -HOU ETHYL BENZENE EPA SW-846: 8020, GC	<1	UG/L	1	04/25/90
STYRN- - -HOU STYRENE EPA SW-846: 8020, GC	<1	UG/L	1	04/25/90
TOL - - -HOU TOLUENE EPA SW-846: 8020, GC	1.1	UG/L	1	04/25/90
XYL - - -HOU XYLENE EPA SW-846: 8020, GC	<1	UG/L	1	04/25/90

ENSR LABORATORIES ©

CONSULTING AND ENGINEERING
2925 RICHMOND AVENUE HOUSTON, TX 77098 (713) 520-1495

Analysis Request and Chain of Custody Record

Project no. 9500-058-340

Client/Project Name FINA

Project Location CALUMET CITY, IL

Lab ID No	Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Container (Size/Mat'l)	Sample Type (Liquid Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
1	12A 1.5-2.0	4-12-90 1000	✓	(1)	120 ml SOIL	Silty CLAY	4°C	BTEX, Styrene	
2	12A 5-6	4-12-90 1000	✓	(1)	120 ml SOIL	CLAY	4°C	BTEX, Styrene	
3	11A 2.5-3.0	4-12-90 1045	✓	(1)	120 ml SOIL	Silty SAND	4°C	BTEX, Styrene	
4	11A 4.5-5.0	4-12-90 1045	✓	(1)	120 ml SOIL	SAND	4°C	BTEX, Styrene	
5	11B 2.5-3.0	4-12-90 1130	✓	(1)	120 ml SOIL	Silty SAND	4°C	BTEX, Styrene	
6	11B 4.5-5.0	4-12-90 1130	✓	(1)	120 ml SOIL	SAND	4°C	BTEX, Styrene	
7	MW3 OLD	4-12-90 1220	✓	(2)	40 ml WATER	WATER	4°C	BTEX, Styrene	
7	MW8 TRD 3-OLD	4-12-90 1220	✓	(1)	250 ml AMB	WATER	4°C	FORMALDEHYDE	
8	T.B.	4-12-90	✓	(2)	40 ml		4°C	TRIP BLANK	
9	F.B	4-12-90	✓	(2)	40 ml	Dis. H_2O	4°C	Field Blank	

Samplers: (Signature) Tony Dappen

Affiliation

Relinquished by: (Signature) Tony Dappen — Date: 4-12-90 Time: 0800

Received by: (Signature) Tony Dappen — Date: 4-12-90 Time: 0800

Relinquished by: (Signature) — Date: Time:

Received by: (Signature) — Date: Time:

Relinquished by: (Signature) — Date: Time:

Received by Laboratory: (Signature) [illegible] — Date: 4-13-90 Time: 0935

COC Seal No. 34240

Intact: ✓

REMARKS:

Data Results To:
1.
2.

Laboratory No. A4101

ENSR LABORATORIES ®
SAMPLE RECEIPT CHECKLIST

CLIENT FINA PROJECT NO. 9500-058-340 LAB NO. A4101

1. X shipped — NOTES: Federal Express # 5913487274
   ____ hand-delivered
2. X COC present on receipt — NOTES:
   ____ no COC
3. X COC tape on shipping container — NOTES: Tape Intact #34240
   ____ no COC tape
4. ____ samples broken/leaking on receipt — NOTES: Intact
   X samples intact on receipt
   ____ other, see notes
5. ____ ambient on receipt — NOTES:
   X chilled on receipt
6. ____ samples preserved correctly — NOTES:
   ____ improper preservatives
   X N/A, no recommended preservatives
   ____ other, see notes
7. X received within holding times — NOTES:
   ____ not received within holding times
   ____ N/A, no recommended holding time
   ____ other, see notes
8. ____ COC tapes on samples — NOTES:
   X no COC tapes
9. ____ discrepancies between COC and sample labels — NOTES:
   X no discrepancies noted
   ____ N/A, no COC received
   ____ other, see notes

Additional comments:
Analyze Trip Blank & Field Blank for BETX & Styrene due to 8x containers submitted

Samples inspected and logged in by: Thelma Howe Date/Time: 4-13-90/0930

ENSR CONSULTING AND ENGINEERING-HOUSTON LABORATORY
QUALITY CONTROL LOG-MATRIX SPIKE
SW 846: 8020; BTEX ANALYSES

LABORATORY NO: A4101

MATRIX SPIKE RECOVERIES SAMPLE: 5

ANALYTE	SPIKE (UG/L)	SAMPLE (UG/L)	CONC MS	% REC	CONC MSD	% REC	RPD	QC LIMITS % REC
BENZENE	20	0	20	102	23	117	-13	39-150
TOLUENE	20	0	20	101	21	105	-5	46-148
ETHYLBENZENE	20	0	19	97	22	108	-10	32-160
TOTAL XYLENES	20	0	18	92	20	98	-6	35-150

COMMENTS:

A C Berman 4-26-90
ANALYST SIGNATURE DATE

Brenda F. Davis 5/2/90
QAQC COORDINATOR DATE

ENSR CONSULTING AND ENGINEERING-HOUSTON LABORATORY
QUALITY CONTROL LOG
SW 846: 8020; BTEX ANALYSIS

LABORATORY NO: A4101

LAB ID	SPIKED AMT(UG)	CALC AMT(UG)	PERCENT RECOVERY (75-125%)
CC042090	30	33.05	110
MB042090	30	27.14	90
5	30	31.41	105
5MS	30	30.26	101
5MSD	30	31.57	105
1	30	30.92	103
2	30	32.18	107
3	30	33.56	112
4	30	32.40	108
6	30	32.38	108
7	30	29.11	97
8	30.0	31.41	105
9	30.0	33.05	110
CC042590E1	30.0	30.27	101
MB042590	30.0	33.53	112

BLANK ANALYSIS DATE: 4/20/90

NO BTEX DETECTED AT STATED METHOD DETECTION LIMITS

COMMENTS:

4-26-90
ANALYST SIGNATURE

Brenda P. Basile 5/2/90
QAQC COORDINATOR

Summary of Analytical Results

Date received: 11-APR-1990 Customer: ENSR Laboratories Job name: M90-04.46

		Samples		
Keystone ID		46-003	46-004	46-005
Date Sampled		4-APR-1990	4-APR-1990	12-APR-1990
Customer ID		A4061-6	A4061-7	A4101-7
Parameters	Units			
Formaldehyde	mg/Kg	2.32	1.49	NR
Formaldehyde	mg/L	NR	NR	0.439
%Solids at 103°C	%	93.7	96.1	NR

Analyzed by: J.T.
Date analyzed: April 18, 1990

Fina Oil and Chemical Company
P.O. Box 2159
Dallas, Texas 75221
(214) 750-2400

April 1, 1993

Mr. Matt Mastronardi
B & V Waste, Science, & Technology Corporation
101 North Wacker
Suite 1100
Chicago, Illinois 60606

Re: Fina Oil & Chemical Company
Former Calumet City Polystyrene Plant
Site Investigation Reports

Dear Mr. Mastronardi:

As a follow-up to our recent telephone conversation, enclosed please find three reports prepared for Fina describing soil and groundwater conditions at the former Calumet City, Illinois polystyrene manufacturing plant. Those reports include:

- Report on Soil & Groundwater Sampling at the former Rohm & Haas Site, May, 1990;
- Report on Soil & Groundwater Sampling of Tract "A" Property, May, 1990: and
- Report on Soil & Groundwater Sampling at Various Other Plant Locations, June, 1990.

Also included for your review is an additional report prepared for Fina entitled Risk Assessment for Fina Oil and Chemical/Cosden Chemical Facility, Calumet City, Illinois. This risk assessment describes results of an evaluation of potential health effects of chemical constituents in the soil and groundwater at the facility. Site locations evaluated for this assessment include the former polystyrene blowdown area, styrene monomer storage area, and areas near manholes where chemical compounds may have been present. The assessment evaluates site data generated from several previous sampling and analysis activities, including a June,

1989 report describing remediation activities at the former styrene blowdown area. A copy of the June, 1989 report is included as Appendix A in the Risk Assessment document. All reports were prepared by ENSR Consulting and Engineering for Fina at the company's request.

I hope this information is helpful to you. If you have any questions or wish to discuss specific aspects of these reports prior to our April 15 meeting, please call.

Very truly yours,

James C. Mahon
Environmental Coordinator

FYI
SWA
WAG
SIZM