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January 27, 1988

O.I. Glass Container Division, S.T.S. 3600 Alameda Avenue Oakland, CA 94601

Attn: Mr. Robert Barber

Re: December Quarterly Ground-Water Sampling and Analysis

Owens Illinois Facility, Oakland, California

Exceltech Project No. 1467G

Dear Mr. Barber:

Please find enclosed the December Quarterly Ground-Water Sampling and Analysis report for the above referenced site. This report contains recent data together with past data.

If you have any questions, please call.

Sincerely, EXCELTECH, INC.

Stephen Costello Staff Geologist

SC/CMP/da enclosure Christopher M. Palmer, C.E.G. 1262 Manager, Geotechnical Services

DECEMBER QUARTERLY GROUND-WATER SAMPLING AND ANALYSIS

FOR

O.I. GLASS CONTAINER DIVISION, S.T.S. 3600 ALAMEDA AVENUE OAKLAND, CALIFORNIA

INTRODUCTION

Exceltech, Inc. has completed the December quarterly sampling program to ascertain the ground-water conditions beneath O.I. Glass Container facility located in Oakland, California (Figure 1). Ground-water sampling was performed on December 1 through December 3, 1987. The purpose of the quarterly sampling program is to monitor ground-water conditions beneath the above referenced site. This information is used to ascertain water quality as requested by Regional Water Quality Control Board (RWQCB), San Francisco Bay Region. The RWQCB is reviewing the site investigation report submitted February, 1987. The sample program objectives are:

- Plot the ground-water contour surface and inferred flow direction.
- Investigate for the presence of hydrocarbon contamination by; 1) checking floating product thickness and; 2) laboratory analyses for either total volatile hydrocarbons (TVH) and the compounds benzene, toluene and xylenes (BTX) or total extractable hydrocarbons (TEH), or both.
- Ascertain the extent and concentrations of the hydrocarbon plume locations and concentrations.
- · Compare current and past data.

Eighteen ground-water monitoring wells (MW-1 through MW-18) and one recovery well (R-1) exist in the project area as shown on Figure 1. Figure 1 also presents the ground-water surface at the site based on data collected on December 1, 1987. The recovery system utilizing one recovery well was taken out of service during remodeling at the plant and is not currently in operation. Analytical results of water samples collected in early December are summarized in Table 1 along with past results. Exceltech's in-house sampling procedures and laboratory procedures are attached in Appendices A and B, respectively. Laboratory reports with chain-of-custody are also attached in Appendix C.

DISCUSSION

Ground-Water Occurrence

Ground-water beneath the site is tidally influenced daily due to its proximity to the Alameda Channel and San Francisco Bay. Past observations of the ground-water surface revealed deflections which vary from 0.1 to 6.0 feet. The range of observed fluctuations is attributed to the changing range of daily tidal fluctuation. A ground-water elevation map for December 1, 1987 is attached (see Figure 1).

Ground-Water Sampling and Analysis

All monitoring wells except MW-1, 2, and 3 were sampled on this round. MW-2 and 3 were not sampled due to the presence of floating product. MW-1 was covered by glass stored in the area. Wells were sampled for presence of floating product, TVH with BTX, and/or TEH. Wells were preselected for individual analyses given the proximity to the known contaminants (i.e., TVH and TEH in the vicinity of the power and forming building, where gasoline and diesel fuels spilled, TEH near the southwestern corner of the site where No. 2 oil was the contaminant). The results are presented on Table 1. The analytical reports are attached.

Contaminant Plume Movement

The distribution of floating product appears to be similar to that of earlier observations, where floating oil occurs mostly in the southwestern corner of the site. Movement of oil appears to be controlled by tidal rise and fall of ground-water. Dissolved contaminants appear most prevalent in the southern portion of the site, similar to previous observations. However, up-gradient wells MW-4 and MW-14 continue to show increased dissolved TEH concentrations.

CONCLUSIONS AND RECOMMENDATIONS

- Increased TEH concentrations in MW-4 and MW-14 may be due to an off-site source.
- 2. Damage to monitoring well MW-4 was observed and should be repaired to prevent future problems.
- 3. The product recovery system should be reactivated with an additional recovery well installed in the vicinity of MW-2.
- 4. Monitoring of floating product and dissolved constituents should continue on a quarterly basis, as requested by the RWQCB.

Required Action

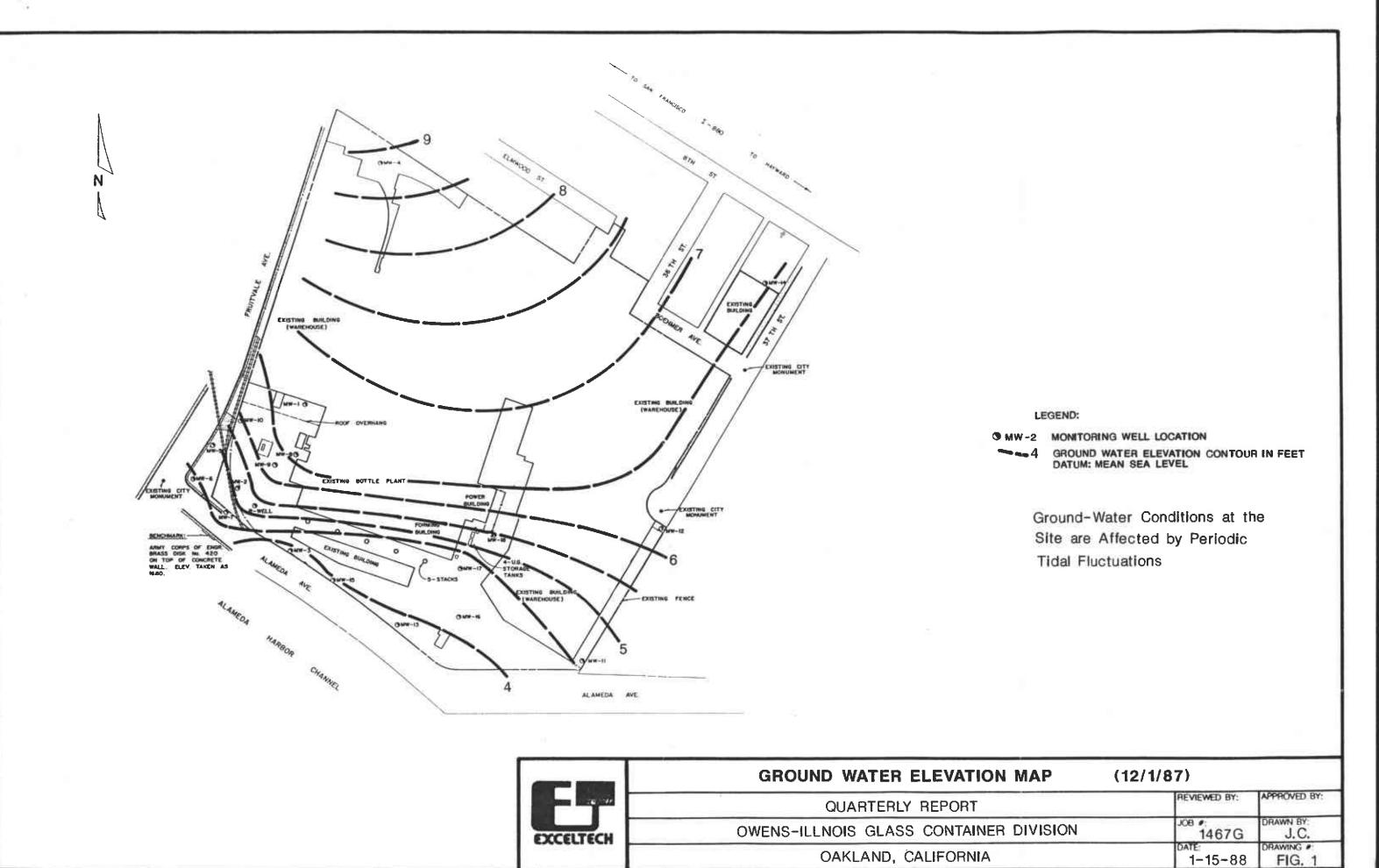
This report should be forwarded in a timely manner to the following agency:

California Regional Water Quality Control Board San Francisco Bay Region 1111 Jackson Street Oakland, California, 94607 Attn: Mr. Greg Zentner

LIMITATIONS

Exceltech makes no warranty, expressed or implied, except that our services have been performed in accordance with generally accepted, existing, engineering, geological, hydrogeological, health and safety principles and applicable regulations at the time and location of the study.

Exceltech includes in this report chemical analytical data from a state-certified laboratory. The analytical results are performed according to procedures suggested by the U.S. EPA and State of California. Exceltech is not responsible for laboratory errors in procedure or result reporting.



1-15-88

Owens Illinois
Exceltech Project No. 1467G

CHEMICAL ANALYTICAL RESULTS

WELL	DATE	TEH	TVH	BENZENE	TOLUENE	XYLENES	GROUND-WATER	PRODUCT
	· · · · · · · · · · · · · · · · · · ·	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	ELEVATION (ft.)	THICKNESS (ft
MW-1	4/9/87	NR	ND	ND	ND ND	ND	7.04	0.005
	9/16/87	***********	NOT SAMPLED		† <i></i>			
	12/1/87		NOT SAMPLED					
MW-2	4/9/87		NOT SAMPLED			****		3.85
	9/16/87		NOT SAMPLED					0.00
	12/1/87	*********	NOT SAMPLED				4.66*	8.49
MW-3	4/9/87	NR	370	ND	ND	ND	5.13	
	9/16/87		NOT SAMPLED	,	1 .	NO.	4.22*	•
	12/1/87		NOT SAMPLED				t :	0.04
	(2,1,0,1		NOT SAIVII EED		l		3.15*	0.25
MW-4	4/9/87	NR	ND	ND	NO	ND	9.32	-
	9/16/87	66	1.3	ND	ND	ND	7,52	
	12/1/87	100	ND	ND	ND	8.9	8.97	-
MW-5	4/9/87	NR	54	ND	ND	ND	4,17	
	9/16/87	96,000	NR NR	NR	NR.	NR.	4.42	* *
	12/1/87	2,000	NR	NR.	NR.	NR.	4.82	Film**
							-	
MW-6	4/9/87		NOT SAMPLED				4.20	0.59
	9/16/87	400,000	NR	NR	NR	NR	4.08	Film**
	12/1/87	30,000	NR.	NR	NR.	NR .	4.44	Film**
MW-7	4/9/87		NOT SAMPLED				3.63	Film
•	9/16/87	790,000	NR	NR	NR	NR	3.47	Film**
	12/1/87	5,500	NR	NR	NR	NR	4.52	Film
MW-8	4/9/87	NR	7.0	ND.	,_			
IAI AA -Q	9/16/87	INT	73 NOT SAMPLED	ND	NO	ND	6.22	Film
				LD.	T		5.86	
	12/1/87		NR.	NR	NR	NR	6.68	-

Owens Illinois Exceltech Project No. 1467G

CHEMICAL ANALYTICAL RESULTS (CONT.)

WELL	DATE	TEH	TVH	BENZENE	TOLUENE	XYLENES	GROUND-WATER	PRODUCT
		(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	ELEVATION (ft.)	THICKNESS (ft.)
	1 1							
MW-9	4/9/87		NOT SAMPLED		+		·- 	
	9/16/87	1,300	NR	NR	NR	NR	1	
i	12/1/87	18,000	NR	NR	NR ·	NR		
							1	
MW-10	4/9/87		300	ND	ND	ND	5.67	FILM
ļ	9/16/87	3,800	NR	NR	NR	NR	4.77	FILM**
	12/1/87	590	NR I	NR	NR	NR	5.88	FILM**
								j
MW-11	4/9/87	NR	VD	ND	ND	ND	4.97	
	9/16/87	NR	NO	ND	ND	ND	4.03	
	12/1/87	NR	ND	0.8	ND	10	4.55	
	ļ							
MW-12	4/9/87	NR	ND	ND	ND	ND	7.00	
	9/16/87	NR	ND	ND	ND	ND	6.03	
	12/1/87	NR	ND	ND	ND	13	6.24	-
	}							
MW-13	4/9/87	NR	ND	ND	סא	10	3.19	
	9/16/87	NR	ND	ND	ND	ND	3.00	
	12/1/87	NR	ND	1.6	ND	12	3.77	-
	1							
MW-14	4/9/87	NR	ND	ND	NO	. ND	7.61	
	9/16/87	56	1.7	ND	ND	ND	6.00	
	12/1/87	66	ND	1.2	4.0	10	6.52	
MW-15	4/9/87	NR	ND	NĎ	ND	ND	3.28	-
	9/16/87	ND	8.4	ND	ND	ND	3.39	
	12/1/87	NR	ND	3.3	0.84	14	3.91	<u>.</u>
					:			
MW-16	4/9/87	NR	ND	ND	ND	ND	4.01	
	9/16/87	64	ND	ND	ND	ND	3.41	
	12/1/87	150	120	1.0	0.37	9.1	4.25	_
				;				
	1						1	
								<u> </u>

Owens Illinois Exceltech Project No. 1467G

CHEMICAL ANALYTICAL RESULTS (CONT.)

WELL	DATE	TEH (ppb)	TVH (ppb)	BENZENE (ppb)	TOLUENE (ppb)	XYLENES (ppb)	GROUND-WATER ELEVATION (ft.)	PRODUCT THICKNESS (ft.)
MW-17	4/9/87 9/16/87 12/1/87	NR 680 1,300	ND 44 540	ND ND 7.8	ND ND 2.4	ND 0.55 28	4.22 3.58 4.30	0.005 Film Film
MW-18	4/9/87 9/16/87 12/1/87	NR 480 18	20 20 20	ND ND ND	9 9 9	ND ND 6.6	4.98 4.52 4.70	

TEH TVH Total Extractable Hydrocarbons

Total Volatile Hydrocarbons

ppb

Parts Per Billion

Connected For Product

product entered upon purging

APPENDIX A SAMPLE PROTOCOL

APPENDIX A

Sampling of monitoring wells is performed by Exceltech technicians. Field sampling procedures are as follows:

- 1. Measurement of liquid surface elevation and depth of monitoring well.
- 2. Field check for presence of floating product.
- 3. If measurement of floating product is <1/4 inch, a groundwater sample is taken.
- 4. Prior to sampling a minimum of four well casings volumes of water is removed.
- 5. During purging, water is monitored for temperature, pH, and specific conductance.
- 6. Samples for analysis are placed in EPA-approved containers.
- 7. Samples are immediately put in a chilled cooler for transportation to a state-certified analytical laboratory.
- 8. Appropriate documentation accompanies the sample at all times.

SAMPLING PROCEDURES

Equipment Cleaning - All water samples are placed in precleaned laboratory supplied glassware. Sample bottles and caps remain sealed until actual usage at the site. Before use at the site, all equipment which comes in contact with the well or groundwater is thoroughly cleaned with trisodium phosphate and rinsed with deionized or distilled water. This procedure is followed between each well sampled, and wells are sampled in approximate order of increasing contamination. A pump blank is collected prior to all sampling. Pump blanks are analyzed periodically to ensure proper cleaning.

<u>Water Level Measurements</u> - Prior to checking for floating product, purging of the well, and sampling, the depth to water is measured in each well using a sealed sounding tape or a scaled electric sounder. Water levels are recorded in the field log book to the nearest 0.01 foot.

Floating Product Thickness - A field check for floating product is made with a clear acrylic or teflon bailer. Thickness of floating product is measured to the nearest 1/32 of an inch. Any observed film as-well-as odor and color of the water is recorded. If a teflon cord is used, the cord is cleaned. If a nylon or cotton cord is used, a new cord is used in each well.

Water Sampling Procedures

Immediately prior to sampling of the groundwater, four well-casing volumes of water are removed. Water is removed by either bailer or submersible nitrogen-driven bladder pump. During the purging operation, purged water is monitored for temperature, pH and specific conductance. After the wells are purged and the temperature, pH, and specific conductance of the water stabilize, a water sample is collected. Samples for volatile organic and gasoline analyses are placed in EPA-approved 40-ml containers with teflon-septa caps. Sample bottles are completely filled with water with no observed air bubbles present within the bottle. Samples for acid, base and neutral organics, pesticides and heavy metals analysis are placed in appropriate laboratory prepared containers. Water sample containers are labeled with the appropriate sample number, location, project name and number, time, and date of collection. All samples are placed in an iced cooler and transported to a state-certified analytical laboratory.

Chain-of-custody forms are logged and signed and accompany the samples to the laboratory. One travel blank accompanies the samples and is held by the lab for possible analysis.

All sample containers issued by the laboratory are properly prepared by the laboratory for the requested analysis.

- Total Volatile Hydrocarbons and/or benzene, toluene and xylenes 2
 40-milliliter bottles
- Total Lead 1 500-milliliter bottle
- Ethylene Dibromide 1 500-milliliter bottle
- Metals 1 500-milliliter bottle
- Pesticides/Herbicides 2 2-liter bottles
- Acid Base Neutral Organics 2 1-liter bottles
- Halogenated Volatile Organics 2 40-milliliter bottles
- Aromatic Volatile Organics 2 40-milliliter bottles (preserved)
- Total Phenolics 1 1-liter bottle (preserved)

APPENDIX B LABORATORY PROCEDURES

APPENDIX B

Selection of the Laboratory

The laboratories selected to perform the analytical work are certified by the California State Department of Health Services as being qualified to perform the selected analyses. The selected laboratories are reviewed by Exceltech, Inc. to ensure that an adequate quality control program is in place.

Chain-of-Custody Control

- The following procedures are used during sampling and analytical activities to provide chain-of-custody control during transfer of samples from collection through delivery to the laboratories. Record keeping activities used to achieve chain-of-custody control are:
 - Contact made by sampling organization with facility supervisor and laboratory prior to sampling to alert them of dates of sampling and sample delivery.
 - Well location map with well identification number prominently displayed.
 - Field log book for documenting sampling activities in the field.

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Laboratory Procedures
Latest Revision: January 4, 1988

· Labels for identifying individual samples.

Chain-of-custody record for documenting transfer and possession of

samples.

Laboratory analysis request sheet for documenting analyses to be

performed.

Sample Containers

Sample containers vary with each type of analytical parameter. Selected

container types and materials are non-reactive with the sample and the

particular analytical parameter being tested. Appropriate containers for

volatile organics are glass bottles of at least 40 milliliters in size fitted

with teflon-faced silicon septa. Sample containers are properly cleaned and

sterilized by the certified laboratory according to the EPA protocol for the

individual analysis.

Sample Preservation and Shipment

Various preservatives are used by the certified laboratory to retard changes

in samples. Sample shipment from Exceltech to laboratories performing the

selected analyses routinely occurs within 24 hours of sample collection.

EXCELTECH, INC.

Laboratory Procedures

Latest Revision: January 4, 1988

Analytical Procedures

The analysis of groundwater samples is conducted in accordance with accepted quantitative analytical procedures. The following four publications are considered the primary references for groundwater sample analysis, and the contracts with the laboratories analyzing the samples stipulate that the methods set out in these publications be used. Please note that procedures used are periodically updated by federal and state agencies, and the certified laboratories amend analysis as required by the update.

- Standard Methods for the Examination of Water and Wastewater, 16th
 Ed., American Public Health Association, et al., 1985.
- Methods for Chemical Analysis of Water and Wastes, U.S. EPA, 600/4-79-020, March 1979.
- Test Methods for Evaluation of Solid Waste: Physical/Chemical Methods, U.S. EPA SW-846, 1982.
- Methods for Organic Chemical Analysis of Municipal and Industrial
 Wastewater, EPA, 600/4-82-057, 1982.
- Practical Guide for Groundwater Sampling, EPA, 600/2-85/104,
 September 1985.

EXCELTECH, INC.
Laboratory Procedures
Latest Revision: January 4, 1988

Analytical Methods

The analytical methods used by the selected laboratories are those required by the type of analysis (fuels, metals, etc.). These methods are those currently approved by the State Regional Water Quality Control Board.

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Laboratory Procedures
Latest Revision: January 4, 1988

APPENDIX C LABORATORY REPORTS

Date Sampled: 12/01/87
Date Received: 12/04/87
Date Reported: 12/28/87

Project: #1467G, Owens-

Illinois

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTX DISTINCTION

Sample Number 7120311

Sample Description

Water, MW-4

	Detection <u>Limit</u> ppb	Sample Results ppb
Low to Medium Boiling Point Hydrocarbons	50	< 50
Benzene	0.5	< 0.5
Toluene	0.5	< 0.5
Xylenes	0.5	8.9

Method of Analysis: EPA 5030/602/8015

SEQUOIA ANALYTICAL LABORATORY



Date Sampled: 12/01/87
Date Received: 12/04/87
Date Reported: 12/28/87

Project: #1467G, Owens-

Illinois

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTX DISTINCTION

Sample Number

7120323

Sample Description

Water, MW-11

	Detection Limit ppb	Sample Results ppb
Low to Medium Boiling Point Hydrocarbons	50	< 50
Benzene	0.5	0.80
Toluene	0.5	< 0.5
_, Xylenes	0.5	10

Method of Analysis: EPA 5030/602/8015

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton

Laboratory Director



Date Sampled: 12/01/87 Date Received: 12/04/87 Date Reported: 12/28/87

Project: #1467G, Owens-

Illinois

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTX DISTINCTION

Sample Number

7120322

Sample Description

Water, MW-12

	Detection <u>Limit</u> ppb	Sample <u>Results</u> ppb
Low to Medium Boiling Point Hydrocarbons	50	< 50
Benzene	0.5	< 0.5
Toluene	0.5	< 0.5
Xylenes	0.5	13

Method of Analysis: EPA 5030/602/8015

SEQUOIA ANALYTICAL LABORATORY

Date Received: 12/01/87
Date Reported: 12/04/87
Date Reported: 12/28/87

Project: #1467G, Owens-

Illinois

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTX DISTINCTION

Sample Number 7120324

Sample Description

Water, MW-13

		Detection Limit ppb	Sample <u>Results</u> ppb
Low to Medium Boiling Point Hydrocarbons		50	< 50
Benzene		0.5	1.6
Toluene	.arģ %	0.5	< 0.5
Xylenes		0.5	12

Method of Analysis: EPA 5030/602/8015

SEQUOIA ANALYTICAL LABORATORY

Date Sampled: 12/01/87 Date Received: 12/04/87 Date Reported: 12/28/87

Project: #1467G, Owens-

Illinois

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTX DISTINCTION

Sample Number

7120325

Sample Description

Water, MW-15

	Detection Limit ppb	Sample Results ppb
Low to Medium Boiling Point Hydrocarbons	50	< 50
Benzene	0.5	3.3
Toluene	0.5	0.84
Xylenes	0.5	14

Method of Analysis: EPA 5030/602/8015

SEQUOIA ANALYTICAL LABORATORY



Date Sampled: 12/01/87
Date Received: 12/04/87
Date Reported: 12/28/87

Project: #1467G, Owens-

Illinois

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTX DISTINCTION

Sample Number

7120313

Sample Description

Water, MW-16

	Detection Limit ppb	Sample Results ppb
Low to Medium Boiling Point Hydrocarbons	50	120
Benzene	0.5	1.0
Toluene	0.5	0.37
Xylenes	0.5	9.1

Method of Analysis: EPA 5030/602/8015

SEQUOIA ANALYTICAL LABORATORY



2549 Middlefield Road

Exceltech 41638 Christy Street Fremont, CA 94538 Attn: Steve Costello

Date Sampled: 12/01/87 Date Received: 12/04/87 Date Reported: 12/28/87

Project: #1467G, Owens-

Illinois

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTX DISTINCTION

Sample Number

7120315

Sample Description

Water, MW-17

	DetectionLimitppb	Sample <u>Results</u> ppb
Low to Medium Boiling Point Hydrocarbons	50	540
Benzene	0.5	7.8
Toluene	0.5	2.4
Xylenes	0.5	28

Method of Analysis: EPA 5030/602/8015

SEQUOIA ANALYTICAL LABORATORY



Date Sampled: 12/01/87
Date Received: 12/04/87
Date Reported: 12/28/87

Project: #1467G, Owens-

Illinois

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTX DISTINCTION

Sample Number

7120314

Sample Description

Water, MW-18

	Detection Limit ppb	Sample Results ppb
Low to Medium Boiling Point Hydrocarbons	50	< 50
Benzene	0.5	< 0.5
Toluene	0.5	< 0.5
Xylenes	0.5	6.6

Method of Analysis: EPA 5030/602/8015

SEQUOIA ANALYTICAL LABORATORY

Date Sampled: 12/01-03/87
Date Received: 12/04/87
Date Reported: 12/28/87

Project: #1467G, Owens-

Illinois

TOTAL PETROLEUM HYDROCARBONS

Sample Number	Sample <pre>Description Water,</pre>	Detection Limit ppb	High Boiling <u>Point Hydrocarbons</u> ppb
7120317	мw-9	50	18,000
7120318	MW-10	50	590
7120319	MW-5	50	2,000
7120320	MW-6	50	30,000
7120321	MW-7	50	5,300

Method of Analysis: EPA 3510/8015

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton

Laboratory Director

Date Sampled: 12/01-03/87
Date Received: 12/04/87
Date Reported: 12/28/87

Project: #1467G, Owens-

Illinois

TOTAL PETROLEUM HYDROCARBONS

Sample Number	Sample <pre>Description Water,</pre>	Detection <u>Limit</u> ppb	High Boiling Point Hydrocarbons ppb
7120311	MW-4	50	100
7120312	MW-14	50	66
7120313	MW-16	50	150
7120314	MW-18	50	18
7120315	MW-17	50	1300
7120316	MW-8	50	630
		ank h	

Method of Analysis: EPA 3510/8015

SEQUOIA ANALYTICAL LABORATORY

CHAIN OF CUSTODY RECORD P.O # 7227 SEQUOIA LAR PROJECT NO PROJECT NAME TEST REQUESTED 14676 OWENS-ILLINOIS SAMPLERS (Signalure) BA 10-DAY Britt Von Maden STATION AND LOCATION CONTINUES TE DATE TIME DEIVE GRAI **FEMARES** MW-H 12/1/97 2:31 P PRESENTED YOA(2), AMBEL LITER (1) MW-14 3:170 $3 \times \times$ MW-12 12/1/87 4201P 2 × 4:43P MW-II 2 × MW-13 12/2/87 9:27A 2 MW-15 10:34A Ħ MW-16 112/2/87 11:24A PRESELVE VOA(2) AMBEL LITEL(1) MW-18 12:18P MW-17 12/2/87 1:178 MAY HAVE HIGH READING 3:190 AMBEL LITEL(1) MW-9 12/3/87 9:08A MW-10 10:234 MAY HAVE MU-5 12/3/87 11:16A HIGH READINGS 12:24P MW-7 12/3/87 1:420 RELINQUISHED BY DATE RELINQUISHED BY DATE TIME RECEIVED AT Butt Vo. Mader LECINQUISHED BY DATE PRÉCEIVED BY RELINQUISHED BY DATE RECEIVED BY LABORATORY HMARKS 41638 CHRISTY STREET REPORT TO STEVE CONTELLO FREWONT, CA 94531 (415) 659-0101 DISTRIBUTION EXCELTECH CONT LIC HEATH