WORKPLAN FOR SOIL AND GROUNDWATER REMEDIATION FOR THE CARNATION COMPANY FACILITY AT 1310 14TH STREET OAKLAND, CALIFORNIA

SUBMITTED TO:

THE ALAMEDA COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH

ON BEHALF OF:

NESTLE USA

PREPARED BY:

PARK ENVIRONMENTAL CORPORATION

FEBRUARY 10, 1993

B:5008J2.WP

Park
Environmental

February 22, 1993

Ms. Jennifer Eberle
Hazardous Materials Division
DEPARTMENT OF ENVIRONMENTAL HEALTH
80 Swan Way, Room 200
Oakland, CA 94601

5008-J2

3779

REFERENCE: **Remediation Workplan**
Carnation Company Facility
1310 14th Street
Oakland, California

Dear Ms. Eberle:

Please find the enclosed remediation workplan for the above referenced site. We will be contacting you to discuss the implementation of this plan.

If you have any questions or need additional information, please contact me at 916/784-7400.

Sincerely,

PARK ENVIRONMENTAL CORPORATION

Peter Frank
Project Geologist

PF:dng

cc: Mr. Walter Carey, Nestle USA, Inc.
Mr. Binayak Acharya, Nestle USA, Inc.

B:5008J2.WP

5100 E. Hunter Ave. Anaheim, CA 92807 TEL 714-777-1001 800-727-7275 FAX. 714-777-1262

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1.0 INTRODUCTION

Nestle USA, Inc., (Nestle) has retained **Park Environmental Corporation (Park)** to provide environmental services at its Carnation Company facility in Oakland, California. A site location map and plot plan are included as Figures 1 and 2 in Appendix A. Nestle has authorized **Park** to prepare this soil and groundwater remediation workplan, which addresses the removal of gasoline constituents from shallow subsurface soils and groundwater in the area surrounding the vehicle maintenance buildings at the site.

This workplan for remediation was requested by the Alameda County Department of Environmental Health (ACDEH), which is the lead environmental regulatory agency. This site is referenced by the ACDEH as 1310 14th Street. The concept of using vapor extraction as a remediation technique was conceptually approved by a ACDEH representative during a meeting on site on October 19, (1992.) ? not JE

The chosen remedial alternative for impacted soil and groundwater at the subject site is vapor extraction utilizing thermal oxidation.

2.0 BACKGROUND

2.1 Facility Description and History

The Carnation Dairy Facility (facility) occupies two square city blocks. The north and south portions of the facility are bounded by 16th and 14th street respectively. The former 15th street is abandoned and at one time was located through the facility. The western side of the property is bounded by Cypress Street and eastern side is bordered by Poplar Street (Figure 1 of Appendix A).

The area surrounding the facility is mostly industrial with several residential dwellings present. The site is generally flat, but has a slight slope to the west. The entire site has buildings or is paved with asphalt or concrete.

The area of environmental concern lies in the north western corner of the facility where an "L" shaped vehicle maintenance building is situated. The building has a warehouse area, a small office and vehicle service bays.

Historically, the facility was constructed by American Creamery in 1915. Carnation Company acquired the property in 1929 and subsequently made additions to the existing building structures between 1946 and 1973 for dairy product processing and distribution. The area of environmental concern contained underground fuel storage and waste oil storage tanks. All the tanks in this area have been removed (Harding Lawson Associates, September 1991). The facility has not been in operation since March, 1991.

2.2 Previous Work

Numerous investigative efforts and remedial actions at this facility have been documented with the ACDEH over the past several years. Investigative efforts have included the removal of the underground storage tanks, preliminary site characterizations, determinations of the lateral and vertical extent of impacted soils, the extent of impacted groundwater, off-site investigations, quarterly groundwater sampling and a preliminary assessment of the source of PCB contamination.

Remedial actions have included the bioremediation of approximately 60 cubic yards of soil that was excavated during the tank removal operations, the removal of approximately 5,000 gallons of free product (petroleum hydrocarbons in the form of gasoline and diesel fuel), the treatment of approximately 1.5 million gallons of groundwater utilizing carbon absorption and the attempt to do in-situ bioremediation of groundwater.

2.3 Geology and Hydrogeology

Previous investigations in this area and at the site, which included drilling and soil sampling, indicate that the facility is predominantly underlain by silt and sand. The silt and sand in this area are referred to as the Merrit Sands.

Groundwater measurements taken by **Park** on October 19, 1992 indicate that groundwater flow is to the north. The hydraulic gradient was calculated to be approximately 0.0016 or 0.16 feet per 100 feet. Groundwater in the area of the facility is approximately 10 feet below the respective ground surface. Several wells were identified as containing free product. Free product thickness ranged from a sheen to 2.80 feet. Free product was not identified in any of the off-site monitoring wells on October 19, 1992.

As part of the pre-remediation design phase, free product samples were collected from seven wells for basic typing of the product present. Results are provided on Table I and laboratory reports are presented as Appendix B.

TABLE I
FREE PRODUCT FINGERPRINT ANALYSES
CARNATION COMPANY FACILITY
OAKLAND, CALIFORNIA
SAMPLE DATE: OCTOBER 20, 1992

Well Number	Petroleum Hydrocarbon Type in Percent		
	Gasoline	Diesel	Motor Oil
MW-7	94.00	0.61	5.31
MW-24	77.20	20.90	1.90
PR-20	68.80	28.40	2.80
PR-26	95.60	0.80	3.60
PR-47	52.90	2.70	44.40
PR-50	98.40	0.40	1.20
PR-62	70.50	26.50	3.00

3.0 WORKPLAN

The purpose of this workplan is to address the proposed remediation of petroleum hydrocarbons present in shallow soils and groundwater beneath a portion of the subject site.

3.1 Scope of Work

The scope of work described in this workplan includes the following:

time schedule?

- Coordination with the ACDEH, California Regional Water Quality Control Board (RWQCB), and the Bay Area Air Quality Management District (BAAQMD);
- Permitting of a vapor extraction system;
- Installation of a vapor extraction system and piping network to utilize existing vadose zone vapor extraction and groundwater wells;
- Operation and maintenance of the vapor extraction system;
- Coordination with regulatory agencies and implementation of a confirmation study prior to site closure; and

- Preparation of quarterly reports and a final report documenting the vapor extraction program.

3.2 Site Safety Plan

A Site Safety Plan (SSP) has been developed for the subject site to address safety provisions needed during the described scope of work. Its purpose is to provide established procedures to protect all on-site personnel from physical hazards and from chemical hazards resulting from direct skin contact, inhalation, or ingestion of potentially hazardous materials that may be on-site, and to establish safe operation of the proposed remediation equipment. The SSP establishes personnel responsibilities, personal protective equipment standards, decontamination procedures, and emergency action plans. A copy of the SSP is included in Appendix C.

4.0 REMEDIATION

4.1 Introduction to Vapor Extraction

Vapor extraction is a viable remedial alternative for removing adsorbed and interstitial product from the vadose and capillary zones of the soil. The results of a vapor extraction treatability test at this site have indicated that vapor extraction is capable of recovering soil vapor with high petroleum hydrocarbon concentrations. The results of this treatability test support the application of vapor extraction as the most viable remediation alternative.

All soils contain a certain percentage of void spaces between the soil particles. Soil void spaces, defined as porosity of the soil, typically comprise 20 to 40 percent of a given volume of soil. Above the saturated zone, void spaces in the unsaturated zone are filled with water and air which is held in retention by capillarity.

Whenever a volatile organic compound (VOC) liquid is released into the vadose zone, the liquid has tendency to move downward and outward into the soil mass. In time the liquid plume of contamination will reach a state of equilibrium if no further releases occur. As the liquid contaminant plume reaches the equilibrium state, the soil void spaces ahead of the liquid contaminant plume will become saturated with contaminant in the air and water contained within the soil void spaces, creating a vapor phase contaminant plume in front of the liquid contaminant plume.

Vapor extraction systems are most applicable to the remediation of the higher volatile or lighter molecular weight constituents. Volatilization rates for contaminants are normally inversely proportional to the individual molecular weights. In other words, the lighter a substance, the more quickly it will volatilize and the greater its equilibrium vapor pressure.

The results of a vapor extraction treatability study have indicated that the radius of influence measured between existing wells may be on the order of 100 feet. In actuality, this number

reflects the path of least resistance for vapor flow and is not indicative of the vapor flow through the lithology containing the greatest portion of contaminants. The bulk of the contaminants are retained in the finer grained silts and sands which have higher capillary pressure and greater surface area. In effect, initial vapor extraction removes free product from the well bore and equilibrated soil vapors from the permeable coarse grained units, while continued vapor extraction allows volatilization of contaminants held in capillarity.

4.2 Equipment Configuration

The vapor extraction equipment includes a 600 standard cubic feet per minute (scfm) blower connected to a series of extraction wells via PVC piping. The vapor extraction system will utilize existing vapor extraction and groundwater wells installed during the assessment phases. All associated piping to these wells will be installed above grade. The vapors are then extracted from the soil where they are routed through a knockout pot to remove liquid and sediment prior to treatment with thermal oxidation. The vapor flow, vacuum, and lower explosive limit (LEL) of the extracted vapor is monitored continuously.

The vapor extraction system to be used at the site is a Thermal Oxidation unit. Thermal oxidation involves oxidizing the hydrocarbons to carbon dioxide and water. A thermal oxidation unit consists of a reinforced, insulated chamber with a bed of silica gravel. Located above and below the bed are vapor duct passages which allow the process vapor flow to be reversed through the bed. The vapor flow is controlled by an automatic valve mechanism which changes the direction of the vapor flow at regular intervals. When hydrocarbon laden process vapor containing abundant oxygen passes through the silica bed and approaches the heating elements, oxidation readily occurs as ignition temperature is reached.

The vapor extraction unit is equipped with safety devices to ensure safe operation of the equipment and safe conditions for the public. In the event of any malfunction the unit shuts off and no vapors containing petroleum hydrocarbons are released. Under no circumstances will untreated soil vapors be vented to the atmosphere. The treated vapors exiting the oxidizer canisters are monitored as per BAAQMD requirements to assure public safety from exposure or explosion. No combustible materials are utilized in the treatment process or stored on-site, minimizing risk of fire or explosion.

4.3 Permitting

Park will be filing for a permit from the BAAQMD for authorization to construct/permit to operate. The system will be constructed while the permitting is in progress.

4.4 Source Testing Plan

A source testing plan will be prepared following requirements of the BAAQMD. This source testing plan will be submitted to the BAAQMD for approval.

4.5 Operation and Maintenance of Vapor Extraction System

The vapor extraction system will be operated as specified by the manufacturer. The performance of the proposed treatment system will be monitored as per BAAQMD guidelines. Initially, the system will be monitored twice weekly for the first two weeks of operation to ensure satisfactory system performance. Site visits will be made weekly thereafter to monitor system performance, and to perform routine maintenance or system adjustments. Soil vapor samples will be collected in accordance with BAAQMD requirements.

4.6 Reporting

Process reports will be prepared by **Park** and submitted to the ACDEH on a quarterly basis. These reports will include: days of system operation, flow rate, vacuum pressure, pounds of product removed, cumulative pounds of product recovered, influent and effluent vapor concentrations, and laboratory reports.

4.7 Suspected PCB Impacted Area

Previous investigations at the site suggested PCB contamination in the subsurface. Currently, **Park** is reviewing and evaluating all the PCB documentation from the prior consultants. We will be presenting to the ACDEH, either a plan to conduct additional sampling or provide options to address any PCB's that may be present in the subsurface.

when ?

5.0 WORK SCHEDULE

Installation of the remediation system will commence immediately upon receiving approval of this workplan. It is anticipated that the system will be operational within several weeks of receiving all required permits.

?

define specify

6.0 REMARKS/SIGNATURES

This workplan represents **Park's** professional opinions. These opinions are based on currently available data and were arrived at in accordance with normally accepted practices.

This workplan was prepared by:

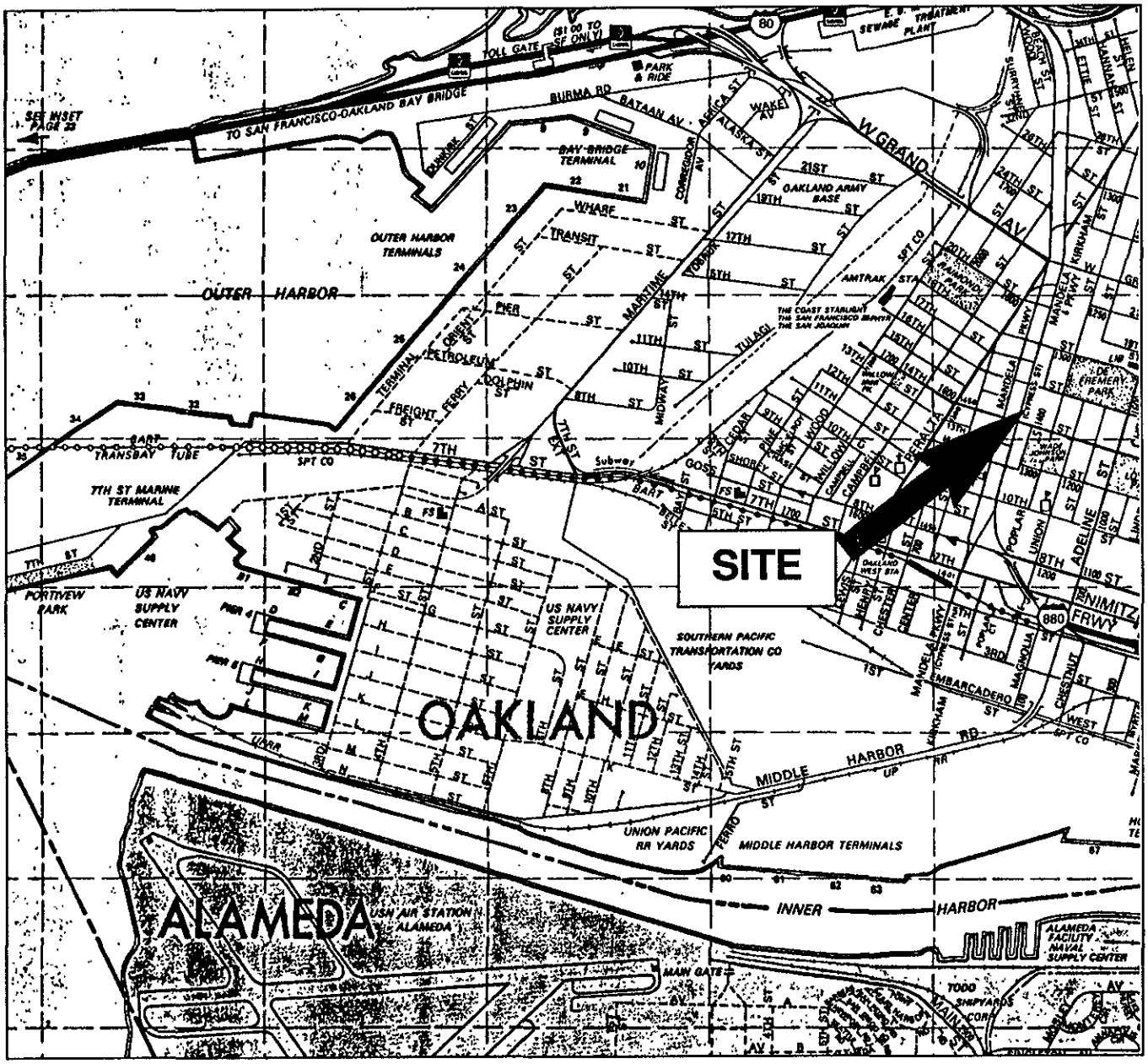
Peter Frank
Project Geologist

seal?

This workplan was reviewed for technical content by:

Richard Zipp, R.G., C.E.G.
Principal Hydrogeologist

PF:dng



REFERENCE 1992, ALEMEDA COUNTY, THOMAS GUIDE MAP, PAGE 7

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W E
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SCALE: 1 INCH
EQUALS 2,200 FEET

SITE LOCATION MAP
CARNATION COMPANY
1310 14TH STREET
OAKLAND, CALIFORNIA
PROJECT # 1137

FIGURE 1

Park Environmental
Leaving A Clean Environment.

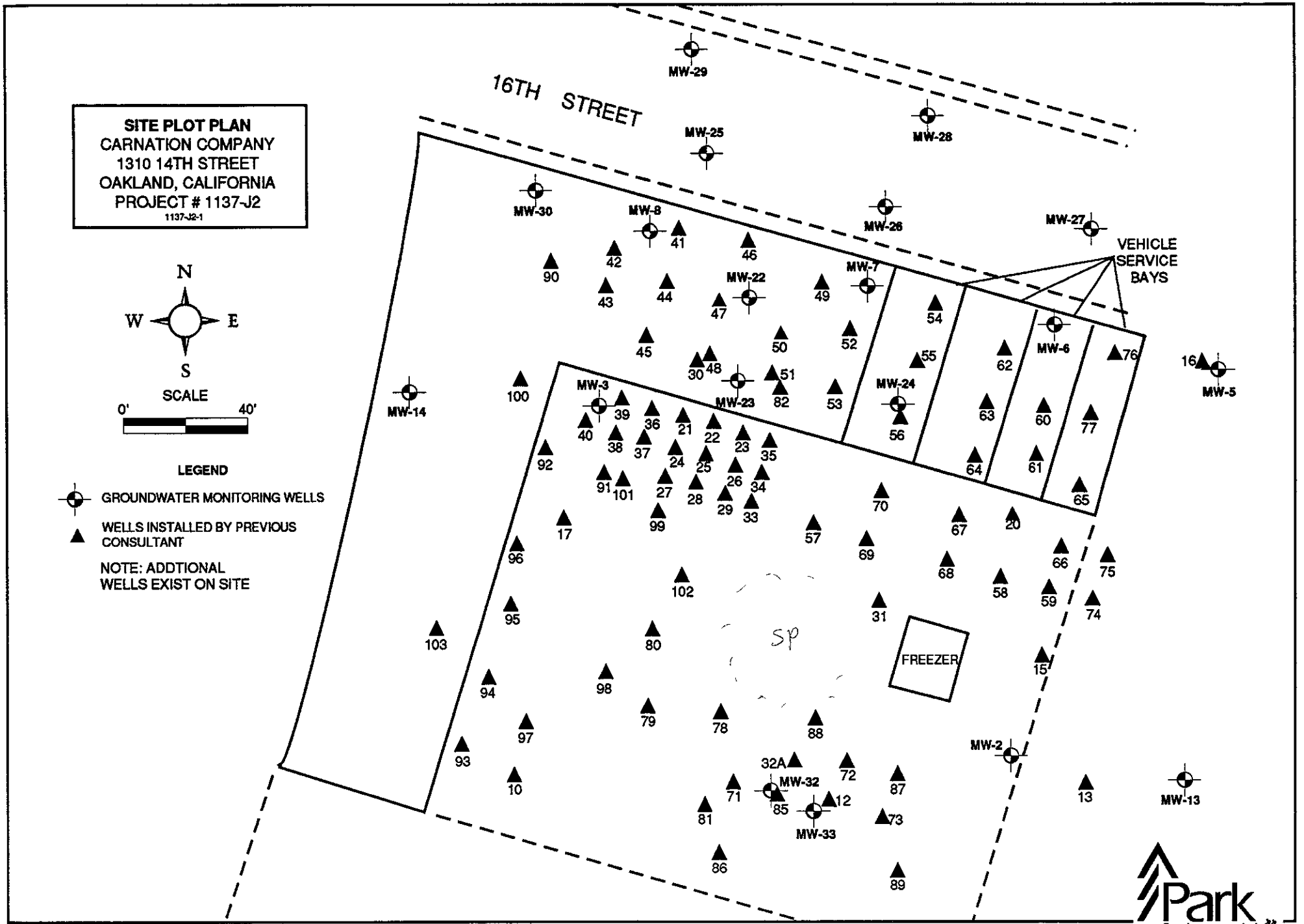

FIGURE 2

Park Environmental
Leaving A Clean Environment

SIERRA
LABORATORIES

Date: October 27,1992

Park Environmental Corporation
2140 Professional Drive, Suite 130
Roseville, California 95661
Attention: Mr. Peter Frank

Client Project Number:	1137-J1
Client Project Name:	N/A
Date Sampled:	October-20-92
Date Samples Received:	October-20-92
Sierra Project Number:	SP-339-92

Enclosed with this letter is the report on the chemo-physical analysis of samples from the project references shown above.

The samples were received by Sierra in a chilled state, intact, and with the chain of custody record attached.

Note that N.D. means not detected at the appropriate reporting limit. The reporting limit is adjusted to reflect the dilution factor of the sample. The reporting limit is expressed in such cases in parentheses to the right of reported value. The detection limit for values without such a designation appears to the right of or at the bottom of the same page.

Reviewed

Approved

1525 ENDEAVOR PLACE
SUITE D
ANAHEIM, CA 92801

TEL: 714.758.9988
FAX: 714.758.9692

Park Environmental Corporation	Sierra Client No.	10000-92	Date Sampled:	10/20/92
2140 Professional Drive, Suite 130	Sierra Project No.	SP-339-92	Date Received:	10/20/92
Roseville, California 95661	Client Project No.	1137-J1	Date Prepared:	10/26/92
	Client Project:		Date Analyzed:	10/26/92
	N/A			

Sample Preparation: Solvent Extraction

Sample Analysis: ASTM D2887 (Simulated Distillation/Fuel Fingerprint) Report Date: 10/27/92

Client Sample I.D.: PR-26
Sample Type: Liquid (Free Product)
Units: mg/kg

Petroleum Hydrocarbon Identification:
Gasoline - 95.60%
Diesel - 0.80%
Motor Oil - 3.60%

Total Petroleum Hydrocarbons: 940000

Hydrocarbon Range	TPH per Hydrocarbon Range	Method Detection Limit per Hydrocarbon Range
HC <C6	ND	1
C6<= HC <C7	223111	1
C7<= HC <C8	196667	1
C8<= HC <C9	152885	1
C9<= HC <C10	136618	1
C10<= HC <C11	111307	1
C11<= HC <C12	53817	1
C12<= HC <C14	21033	1
C14<= HC <C16	3222	1
C16<= HC <C18	2406	1
C18<= HC <C20	1418	1
C20<= HC <C24	480	1
C24<= HC <C28	20439	1
C28<= HC <C32	10444	1
C32<= HC	2543	1

	TPH mg/kg
Method Detection Limit:	15

Park Environmental Corporation	Sierra Client No.	10000-92	Date Sampled:	.10/20/92
2140 Professional Drive, Suite 130	Sierra Project No.	SP-339-92	Date Received:	.10/20/92
Roseville, California 95661	Client Project No.	1137-J1	Date Prepared:	.10/26/92
	Client Project:		Date Analyzed:	.10/26/92
	N/A			

Sample Preparation: Solvent Extraction

Sample Analysis: ASTM D2887 (Simulated Distillation/Fuel Fingerprint) Report Date: .10/27/92

Client Sample I.D.: MW-24
Sample Type: Liquid (Free Product)
Units: mg/kg

Petroleum Hydrocarbon Identification:
Gasoline - 77.20%
Diesel - 20.90%
Motor Oil - 1.90%

Total Petroleum Hydrocarbons: 950000

Hydrocarbon Range	TPH per Hydrocarbon Range	Method Detection Limit per Hydrocarbon Range
HC <C6	ND	1
C6<= HC <C7	192854	1
C7<= HC <C8	214354	1
C8<= HC <C9	162008	1
C9<= HC <C10	132168	1
C10<= HC <C11	101946	1
C11<= HC <C12	45323	1
C12<= HC <C14	28574	1
C14<= HC <C16	15048	1
C16<= HC <C18	20272	1
C18<= HC <C20	18453	1
C20<= HC <C24	16499	1
C24<= HC <C28	4165	1
C28<= HC <C32	ND	1
C32<= HC	ND	1

	TPH mg/kg
Method Detection Limit:	15

Park Environmental Corporation	Sierra Client No.	10000-92	Date Sampled:	10/20/92
2140 Professional Drive, Suite 130	Sierra Project No.	SP-339-92	Date Received:	10/20/92
Roseville, California 95661	Client Project No.	1137-J1	Date Prepared:	10/26/92
	Client Project:		Date Analyzed:	10/26/92
	N/A			

Sample Preparation: Solvent Extraction

Sample Analysis: ASTM D2887 (Simulated Distillation/Fuel Fingerprint) Report Date: 10/27/92

Client Sample I.D.: PR-20
Sample Type: Liquid (Free Product)
Units: mg/kg

Petroleum Hydrocarbon Identification:
Gasoline - 68.80%
Diesel - 28.40%
Motor Oil - 2.80%

Total Petroleum Hydrocarbons: 880000

Hydrocarbon Range	TPH per Hydrocarbon Range	Method Detection Limit per Hydrocarbon Range
HC <C6	ND	1
C6<= HC <C7	157268	1
C7<= HC <C8	262267	1
C8<= HC <C9	125277	1
C9<= HC <C10	92115	1
C10<= HC <C11	80073	1
C11<= HC <C12	47766	1
C12<= HC <C14	29955	1
C14<= HC <C16	14916	1
C16<= HC <C18	21641	1
C18<= HC <C20	18384	1
C20<= HC <C24	23047	1
C24<= HC <C28	9248	1
C28<= HC <C32	ND	1
C32<= HC	ND	1

	TPH mg/kg
Method Detection Limit:	15

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	Client Project:		Date Analyzed: .10/26/92
	N/A		

Sample Preparation: Solvent Extraction

Sample Analysis: ASTM D2887 (Simulated Distillation/Fuel Fingerprint) Report Date: .10/27/92

Client Sample I.D.: PR-62
Sample Type: Liquid (Free Product)
Units: mg/kg

Petroleum Hydrocarbon Identification:
Gasoline - 70.50%
Diesel - 26.50%
Motor Oil - 3.00%

Total Petroleum Hydrocarbons: 1000000

Hydrocarbon Range	TPH per Hydrocarbon Range	Method Detection Limit per Hydrocarbon Range
HC <C6	ND	1
C6<= HC <C7	239558	1
C7<= HC <C8	237309	1
C8<= HC <C9	144418	1
C9<= HC <C10	125063	1
C10<= HC <C11	108509	1
C11<= HC <C12	52164	1
C12<= HC <C14	24722	1
C14<= HC <C16	8131	1
C16<= HC <C18	9729	1
C18<= HC <C20	9939	1
C20<= HC <C24	11988	1
C24<= HC <C28	28123	1
C28<= HC <C32	11749	1
C32<= HC	ND	1

	TPH mg/kg
Method Detection Limit:	15

Park Environmental Corporation	Sierra Client No.	10000-92	Date Sampled:	.10/20/92
2140 Professional Drive, Suite 130	Sierra Project No.	SP-339-92	Date Received:	.10/20/92
Roseville, California 95661	Client Project No.	1137-J1	Date Prepared:	.10/26/92
	Client Project:		Date Analyzed:	.10/26/92
	N/A			
Sample Preparation: Solvent Extraction				
Sample Analysis: ASTM D2887 (Simulated Distillation/Fuel Fingerprint)			Report Date:	.10/27/92

Client Sample I.D.: MW-7
Sample Type: Liquid (Free Product)
Units: mg/kg

Petroleum Hydrocarbon Identification:
Gasoline - 94.00%
Diesel - 0.61%
Motor Oil - 5.31%

Total Petroleum Hydrocarbons: 1200000

Hydrocarbon Range	TPH per Hydrocarbon Range	Method Detection Limit per Hydrocarbon Range
HC <C6	ND	1
C6<= HC <C7	223290	1
C7<= HC <C8	283523	1
C8<= HC <C9	172084	1
C9<= HC <C10	149380	1
C10<= HC <C11	109472	1
C11<= HC <C12	63539	1
C12<= HC <C14	23634	1
C14<= HC <C16	3174	1
C16<= HC <C18	3486	1
C18<= HC <C20	4102	1
C20<= HC <C24	15274	1
C24<= HC <C28	82486	1
C28<= HC <C32	37981	1
C32<= HC	19896	1
	TPH mg/kg	

Method Detection Limit: 15

Park Environmental Corporation
2140 Professional Drive, Suite 130
Roseville, California 95661

Sierra Client No.	10000-92	Date Sampled:	10/20/92
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Client Project No.	1137-J1	Date Prepared:	10/26/92
Client Project:		Date Analyzed:	10/26/92
N/A			

Sample Preparation: Solvent Extraction

Sample Analysis: ASTM D2887 (Simulated Distillation/Fuel Fingerprint) Report Date: 10/27/92

Client Sample I.D.: PR-50
Sample Type: Liquid (Free Product)
Units: mg/kg

Petroleum Hydrocarbon Identification:

Gasoline -	98.40%
Diesel -	0.40%
Motor Oil -	1.20%

Total Petroleum Hydrocarbons: 960000

Hydrocarbon Range	TPH per Hydrocarbon Range	Method Detection Limit per Hydrocarbon Range
HC <C6	ND	1
C6<= HC <C7	139844	1
C7<= HC <C8	245384	1
C8<= HC <C9	145852	1
C9<= HC <C10	152467	1
C10<= HC <C11	122162	1
C11<= HC <C12	48351	1
C12<= HC <C14	18195	1
C14<= HC <C16	2463	1
C16<= HC <C18	1067	1
C18<= HC <C20	929	1
C20<= HC <C24	6159	1
C24<= HC <C28	46679	1
C28<= HC <C32	24356	1
C32<= HC	10726	1

	TPH mg/kg
Method Detection Limit:	15

Park Environmental Corporation	Sierra Client No.	10000-92	Date Sampled:	.10/20/92
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Roseville, California 95661	Client Project No.	1137-J1	Date Prepared:	.10/26/92
	Client Project:		Date Analyzed:	.10/26/92
	N/A			
Sample Preparation: Solvent Extraction				
Sample Analysis: ASTM D2887 (Simulated Distillation/Fuel Fingerprint)			Report Date:	.10/27/92

Client Sample I.D.: PR-47
Sample Type: Liquid (Free Product)
Units: mg/kg

Petroleum Hydrocarbon Identification:
Gasoline - 52.90%
Diesel - 2.70%
Motor Oil - 44.40%

Total Petroleum Hydrocarbons: 1200000

Hydrocarbon Range	TPH per Hydrocarbon Range	Method Detection Limit per Hydrocarbon Range
HC <C6	ND	1
C6<= HC <C7	121758	1
C7<= HC <C8	179240	1
C8<= HC <C9	105512	1
C9<= HC <C10	101650	1
C10<= HC <C11	92581	1
C11<= HC <C12	52374	1
C12<= HC <C14	24116	1
C14<= HC <C16	4617	1
C16<= HC <C18	6020	1
C18<= HC <C20	14074	1
C20<= HC <C24	109365	1
C24<= HC <C28	295096	1
C28<= HC <C32	92881	1
C32<= HC	50349	1
	TPH mg/kg	

Method Detection Limit: 15

Park Environmental Corporation
2140 Professional Drive, Suite 130
Roseville, California 95661

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Client Project No.	1137-J1	Date Prepared:	.10/26/92
Client Project:		Date Analyzed:	.10/26/92
N/A			

Sample Preparation: Solvent Extraction
Sample Analysis: ASTM D2887 (Simulated Distillation/Fuel Fingerprint) Report Date: .10/27/92

Matrix/Spike Duplicate Report

Sample Type: Liquid

	TPH-Diesel	(Range)
Matrix Spike Recovery (%)	119	(50-150)
Matrix Spike Duplicate Recovery (%)	108	(50-150)
Relative Per-cent Difference	10	(0-30)

Quality Control Reference Number: G001-102692(l)2887-1-071-072

Park Environmental Corporation
2140 Professional Drive, Suite 130
Roseville, California 95661

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Client Project:		Date Analyzed:	10/26/92
N/A			
		Report Date:	10/27/92

Surrogate Summary Report

Client Sample I.D.	Analysis Type	Per-cent Recovery S1	(Range)
PR 26	ASTM D2887 (SIMDIS/Fuel Fingerprint)	85	(50-150)
MW 24	ASTM D2887 (SIMDIS/Fuel Fingerprint)	115	(50-150)
PR 20	ASTM D2887 (SIMDIS/Fuel Fingerprint)	86	(50-150)
PR 62	ASTM D2887 (SIMDIS/Fuel Fingerprint)	84	(50-150)
MW-7	ASTM D2887 (SIMDIS/Fuel Fingerprint)	104	(50-150)
PR-50	ASTM D2887 (SIMDIS/Fuel Fingerprint)	84	(50-150)
PR-47	ASTM D2887 (SIMDIS/Fuel Fingerprint)	104	(50-150)

Park Environmental Corporation
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Roseville, California 95661

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Client Project No.	1137-J1	Date Prepared:	10/26/92
Client Project:		Date Analyzed:	10/26/92
N/A			
		Report Date:	10/27/92

Laboratory Control Sample Report

Parameter	Analysis Type	Per-cent Recovery	
		%	Range
Diesel	ASTM D2887 (SIMDIS/Fuel Fingerprint)	119	(50-150)
	Quality Control Reference Number:	G001-102692(L)2887-1-073	

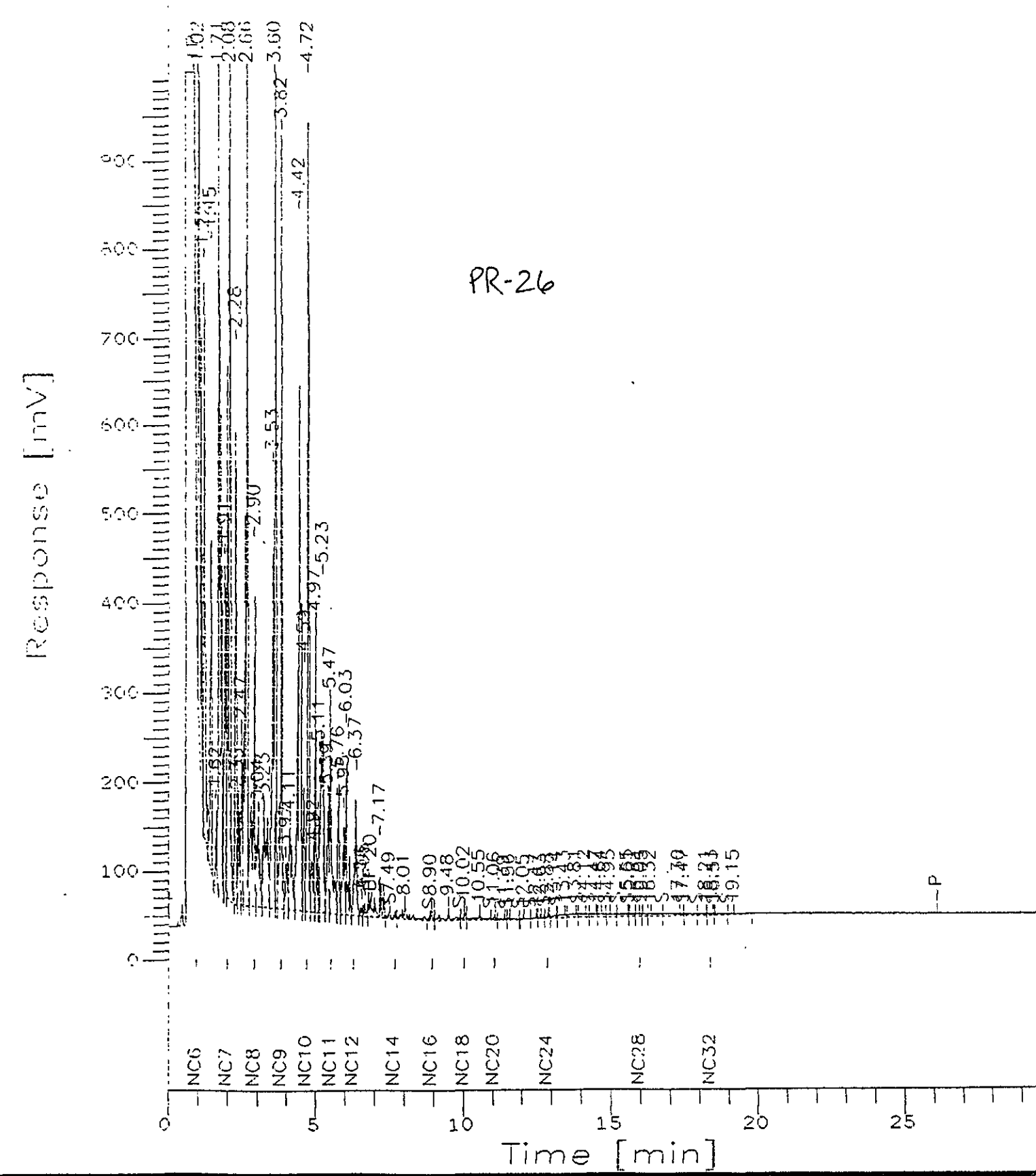
Chromatogram

Sample Name :
FileName : c:\2957-1\g1bf046.raw
Method : G1295708.ins
Start Time : 0.00 min End Time : 29.99 min
Scale Factor: 0 Plot Offset: 0 mV

Sample #: 40
Date : 10/26/92 04:07 PM
Time of Injection: 10/26/92 04:03 PM
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000 mV

Page 1 of 1

PR-26

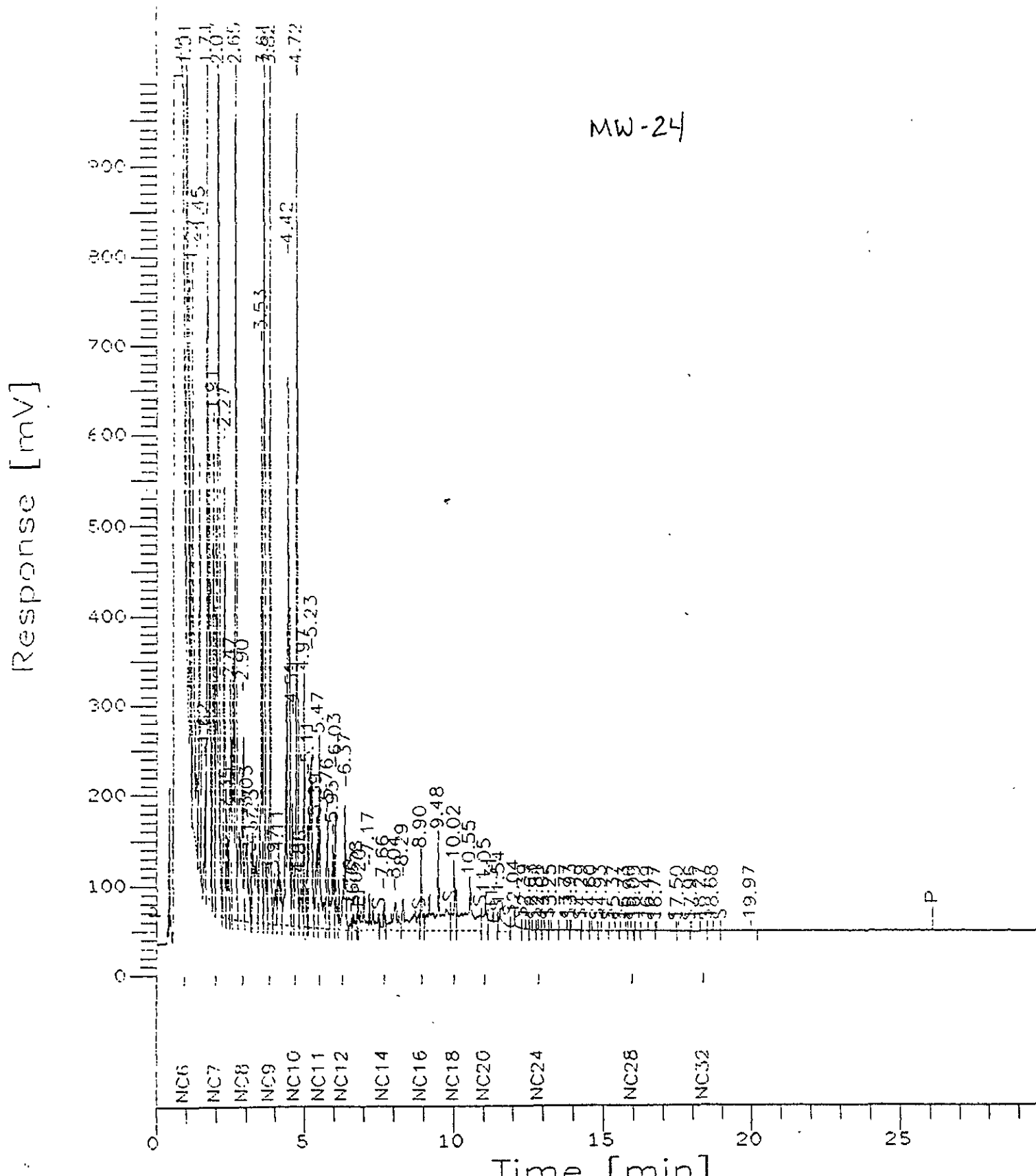


Chromatogram

Sample Name :
FileName : c:\2887-1\gibf048.raw
Method : G1299702E.ins
Start Time : 0.00 min End Time : 29.99 min
Scale Factor: 0 Plot Offset: 0 mV

Sample #: 42 Page 1 of 1
Date : 10/26/92 05:04 PM
Time of Injection: 10/27/92 09:24 PM
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000 mV

MW-24

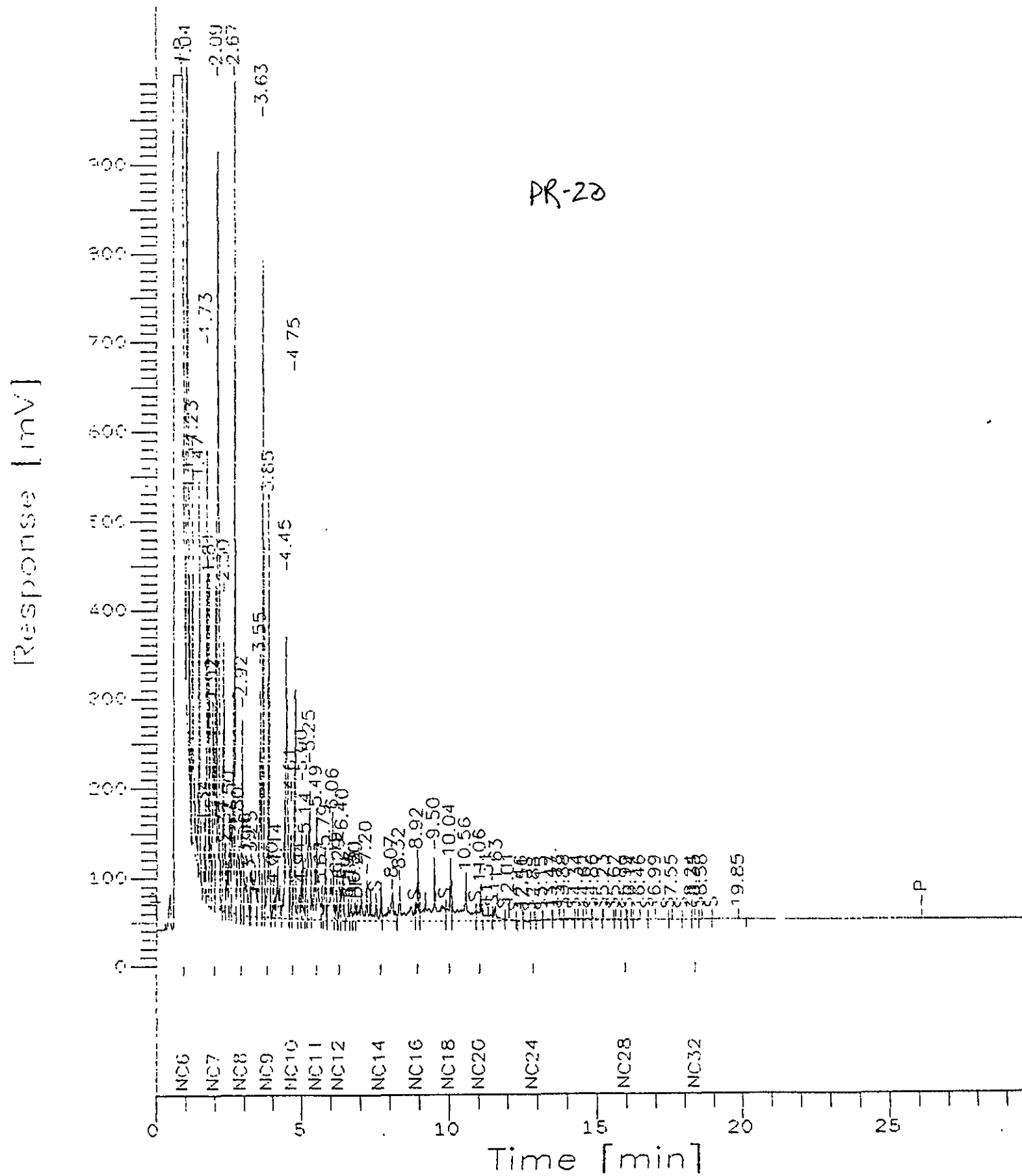


Chromatogram

Sample Name :
FileName : c:\2887-1\gibf041.raw
Method : G1288702.ims
Start Time : 0.00 min End Time : 29.99 min
Scale Factor: 0 Plot Offset: 0 mV

Sample #: 35 Page 1 of 1
Date : 10/26/92 03:12 PM
Time of Injection: 10/23/92 04:40 PM
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000 mV

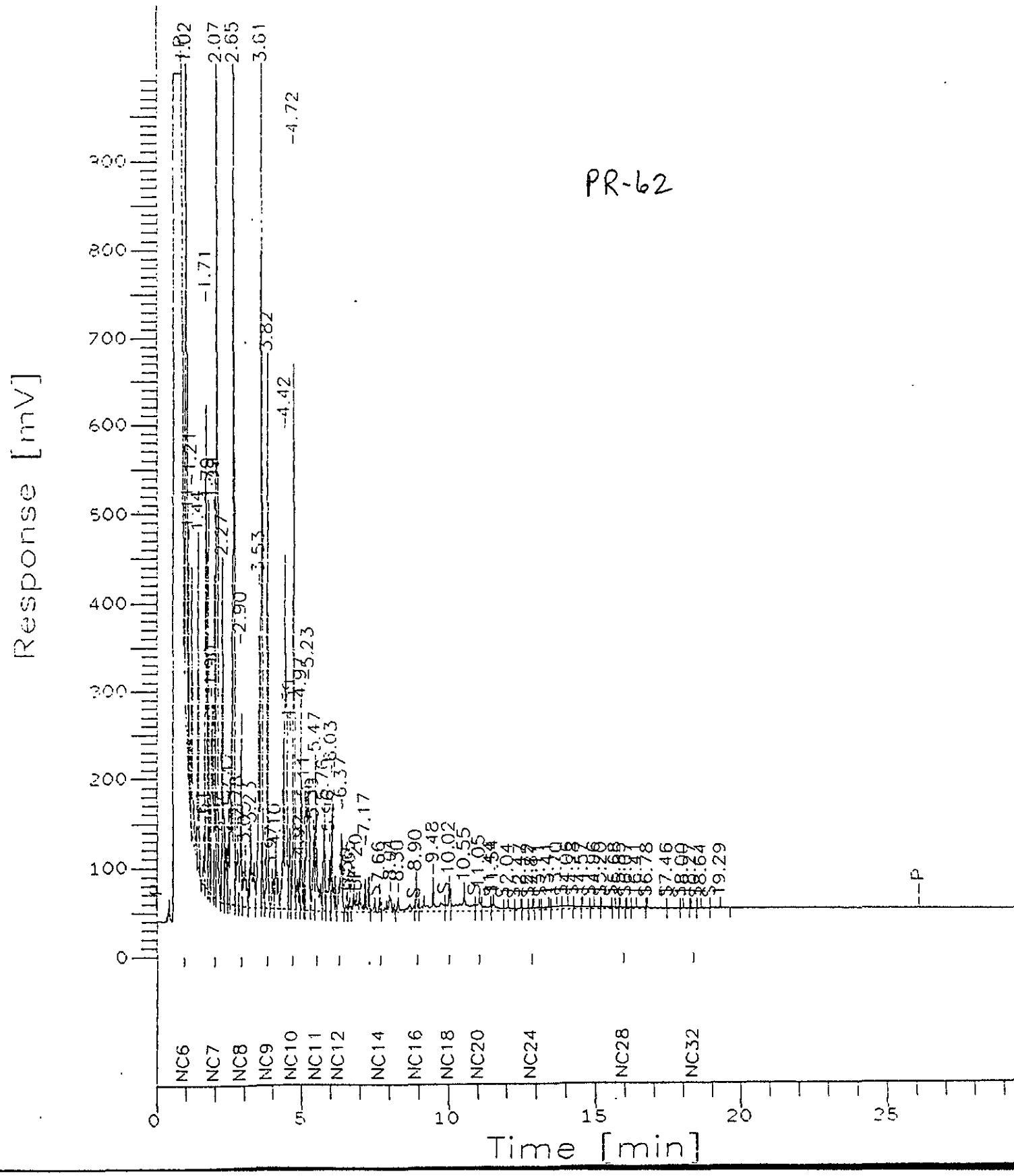
PR-28



Sample Name :
FileName : c:\2687-1\g1bf045.raw
Method : G1286?08.ins
Start Time : 0.00 min End Time : 29.99 min
Scale Factor: 0 Plot Offset: 0 mV

Sample #: 39 Page 1 of 1
Date : 10/26/92 05:02 PM
Time of Injection: 10/23/92 07:23 PM
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000 mV

PR-62

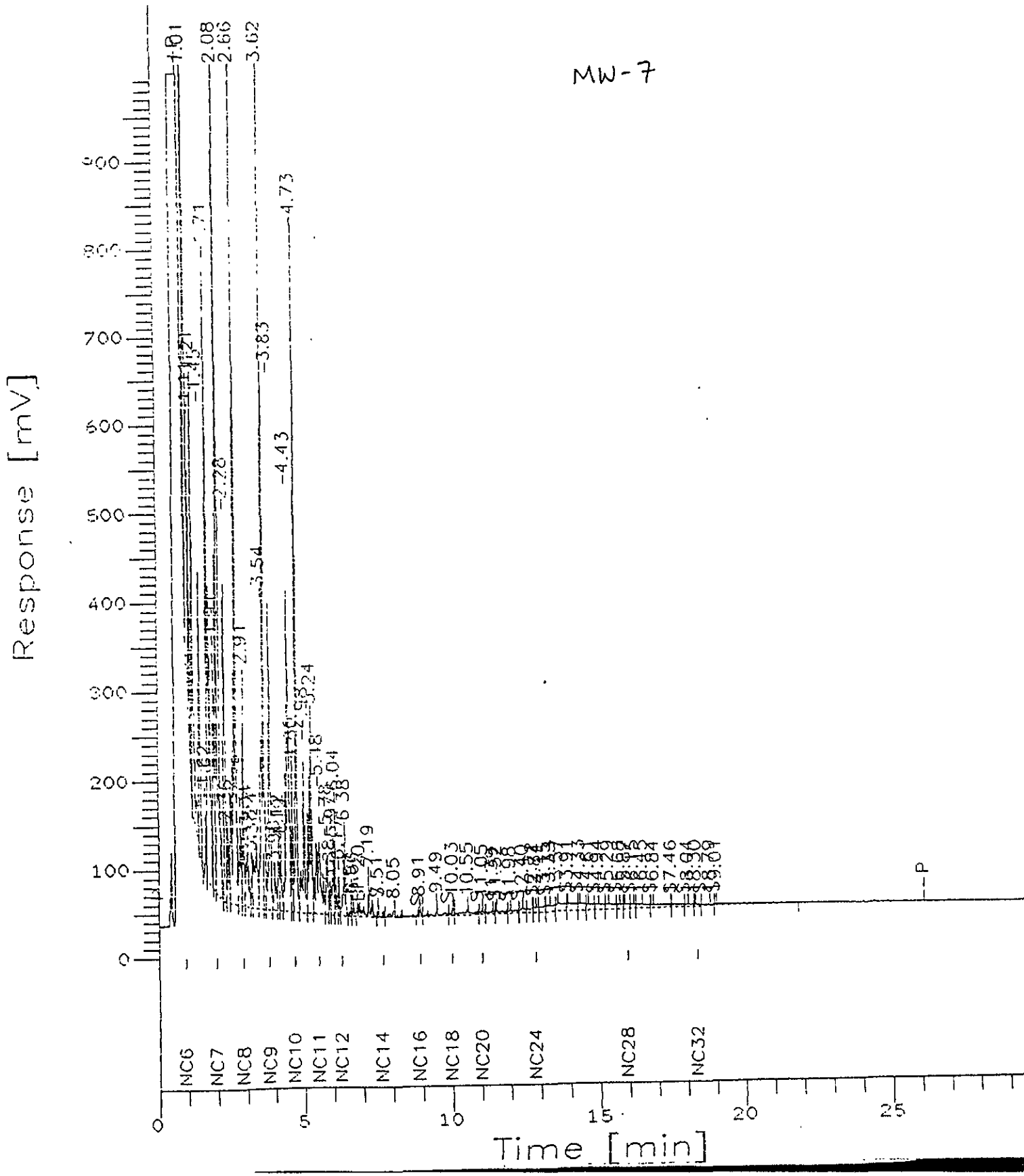


Chromatogram

Sample Name :
FileName : c:\2687-1\g1bf037.raw
Method : G1288703.ins
Start Time : 0.00 min End Time : 29.99 min
Scale Factor: 0 Plot Offset: 0 mV

Sample #: 31
Date : 10/26/92 03:11 PM
Time of Injection: 10/23/92 02:43 PM
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000 mV

MW-7

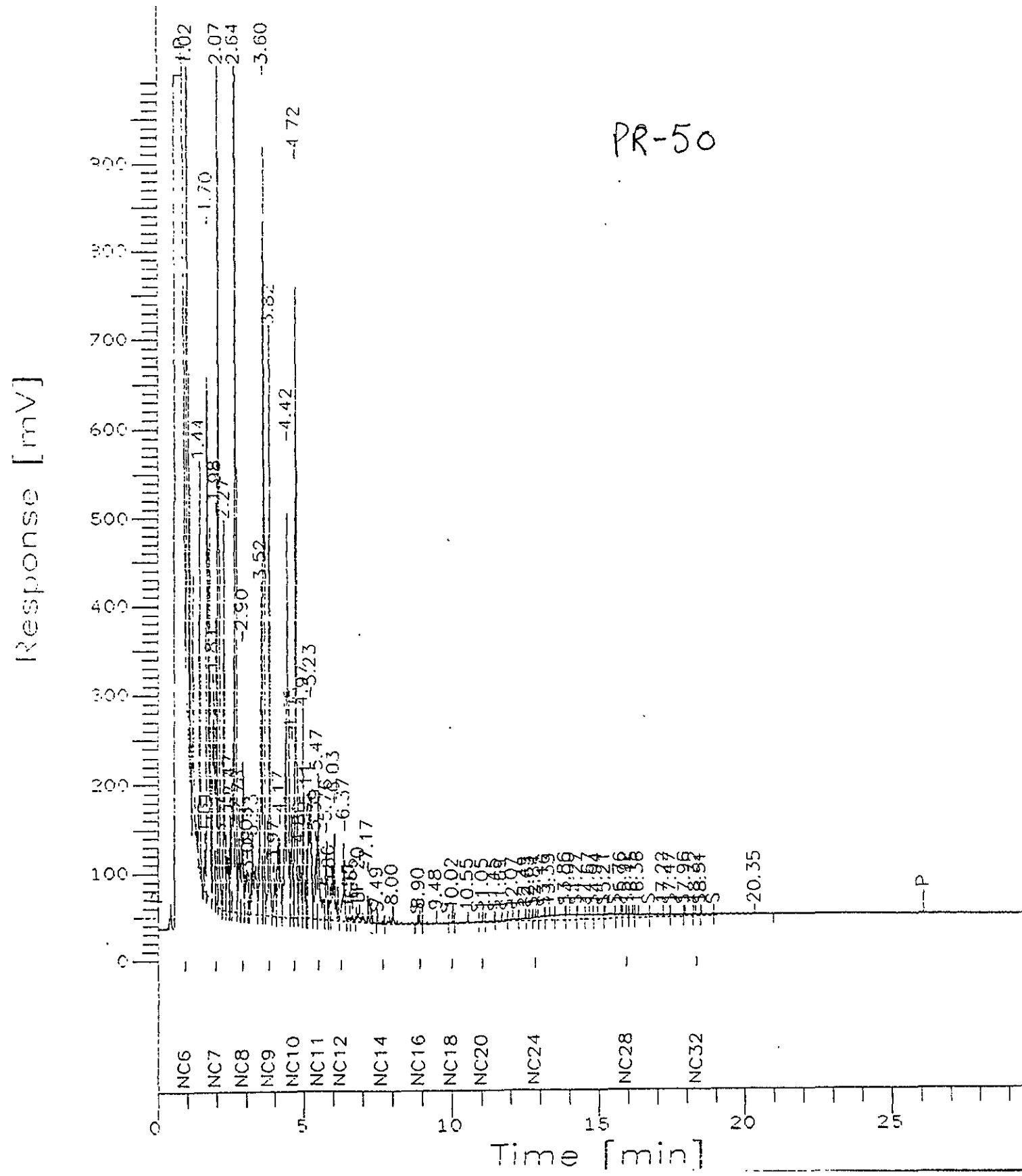


Chromatogram

Sample Name :
FileName : c:\2667-1\g1bf047.raw
Method : G1266703.ins
Start Time : 0.00 min End Time : 29.99 min
Scale Factor: 0 Plot Offset: 0 mV

Sample #: 41 Page 1 of 1
Date : 10/26/92 05:03 PM
Time of Injection: 10/23/92 08:44 PM
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000 mV

PR-50

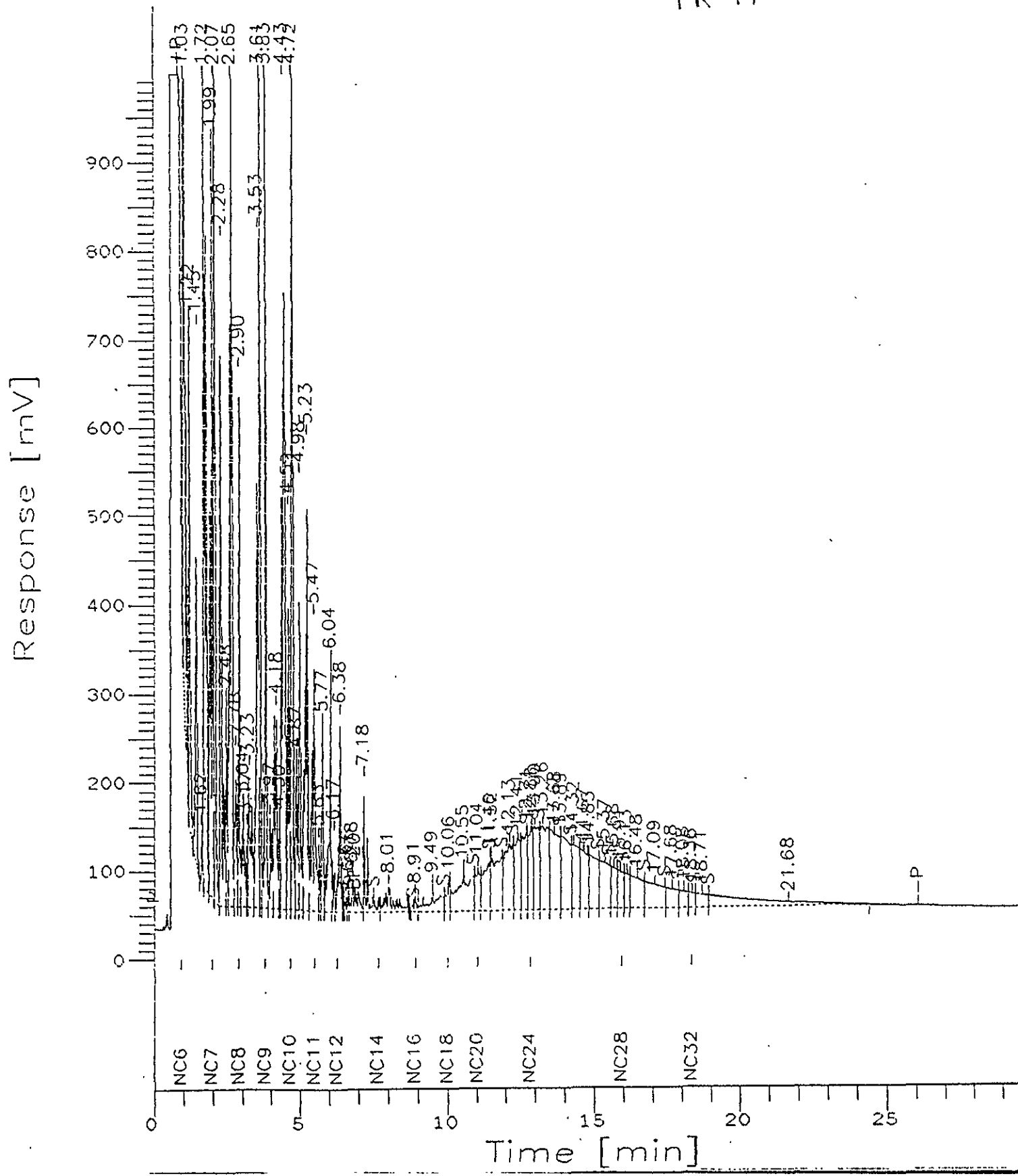


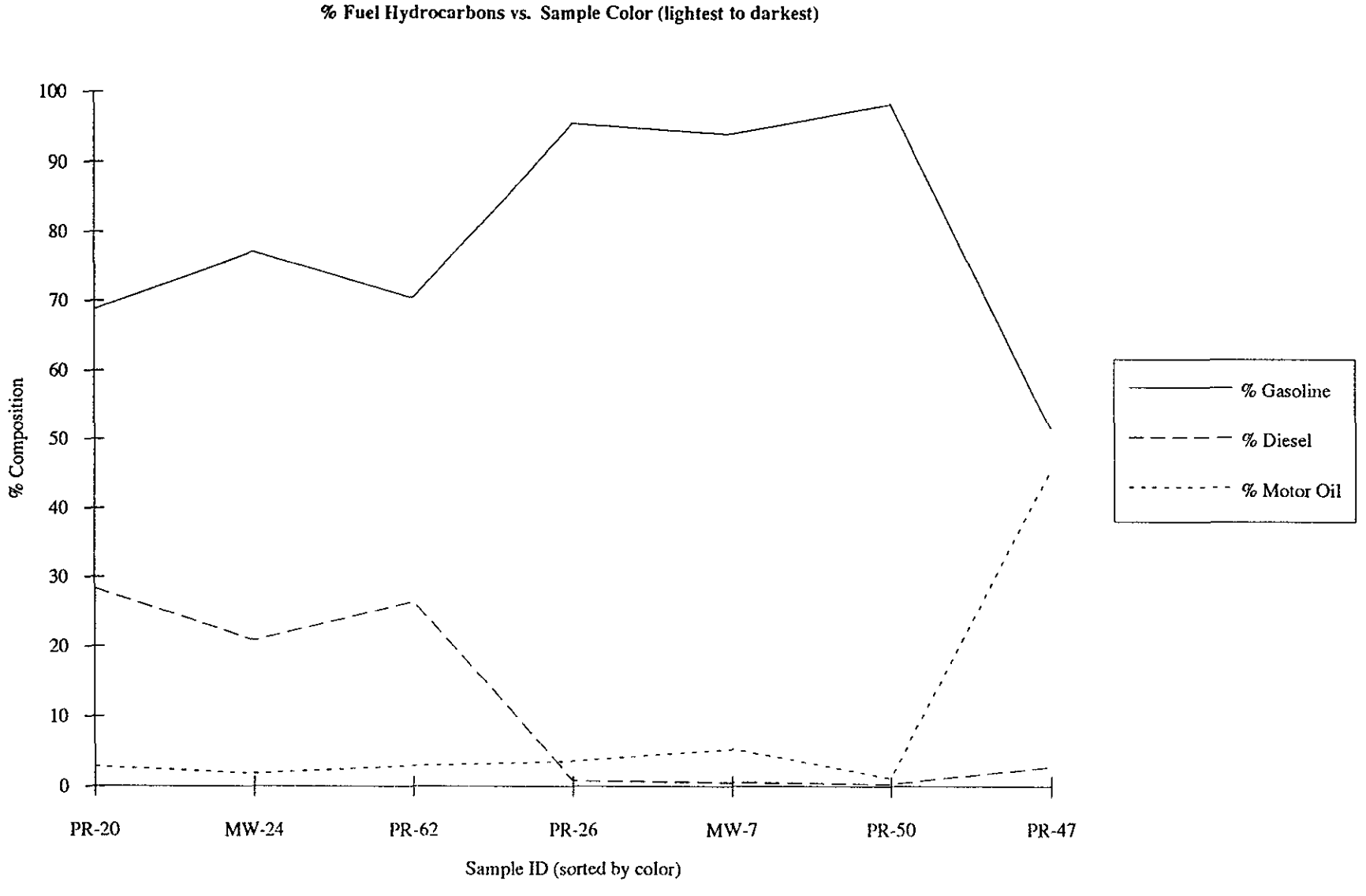
Chromatogram

Sample Name :
FileName : c:\2887-1\g1bf036.raw
Method : G1286708.ins
Start Time : 0.00 min End Time : 29.99 min
Scale Factor: 0 Plot Offset: 0 mV

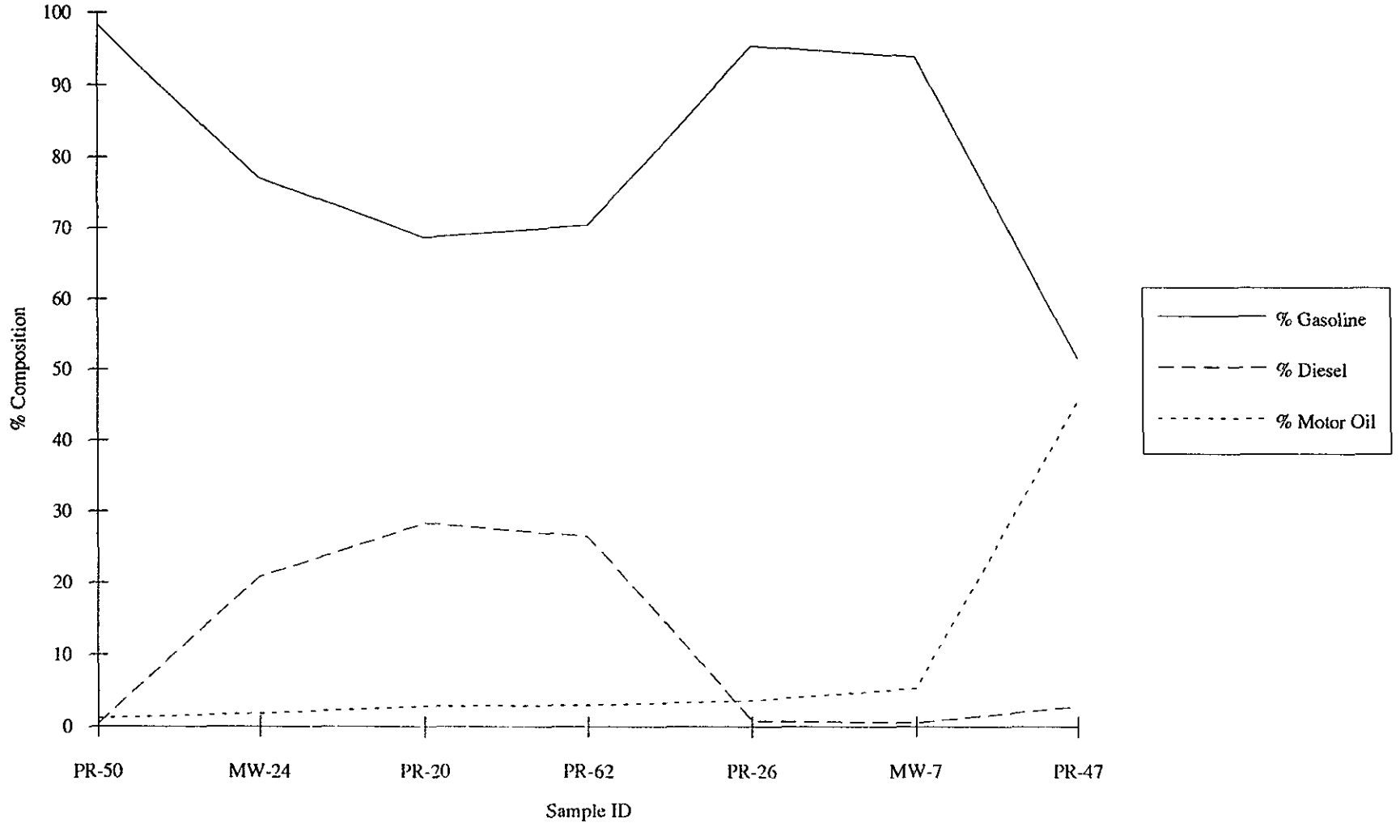
Sample #: 30
Date : 10/26/92 03:11 PM
Time of Injection: 10/23/92 02:02 PM
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000 mV

PR-47

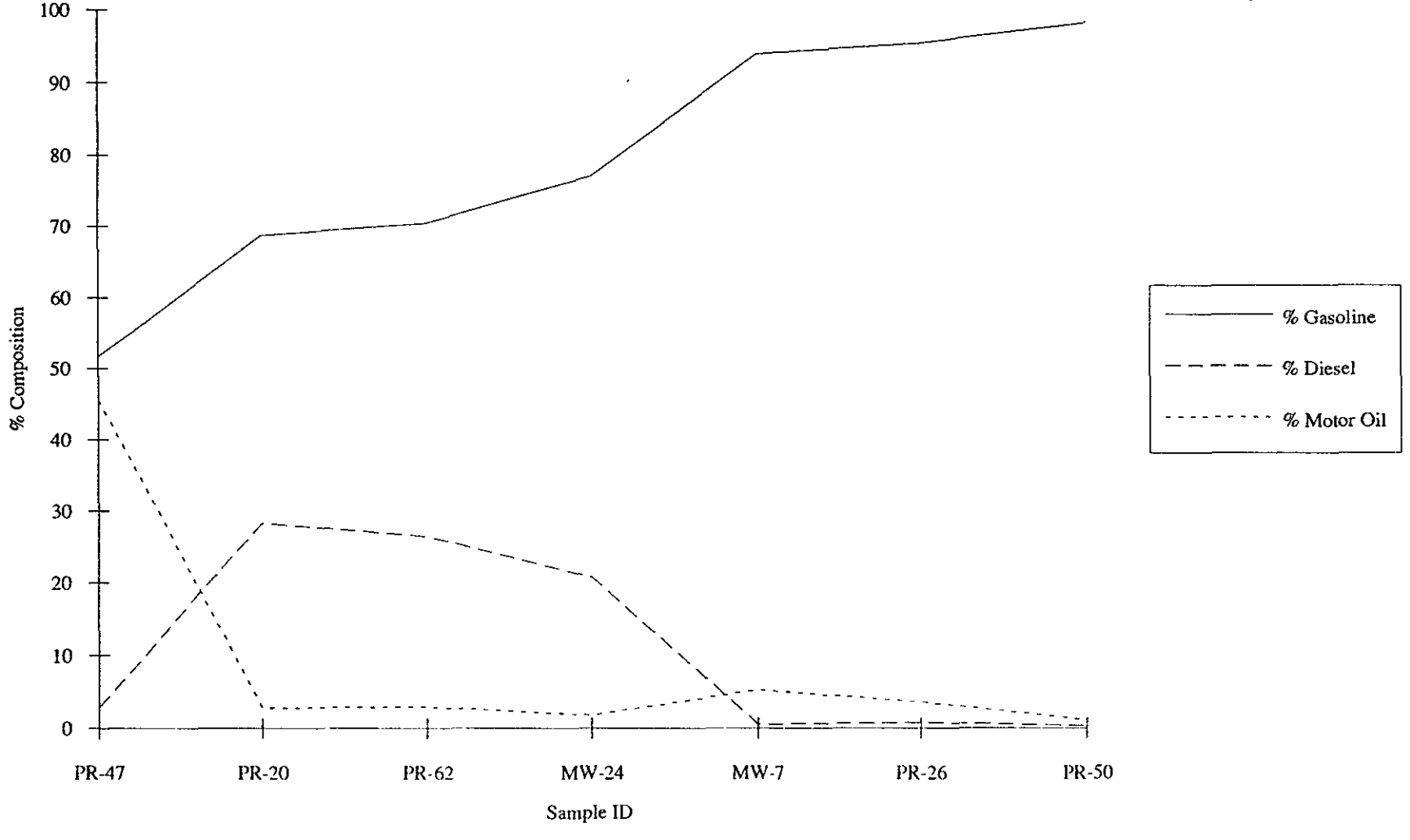



% Fuel Hydrocarbons vs. Sample Color (lightest to darkest)
100
90
80
70
60
50
40
30
20
10
0
% Composition
PR-20
MW-24
PR-62
PR-26
MW-7
PR-50
PR-47
Sample ID (sorted by color)
% Gasoline
% Diesel
% Motor Oil

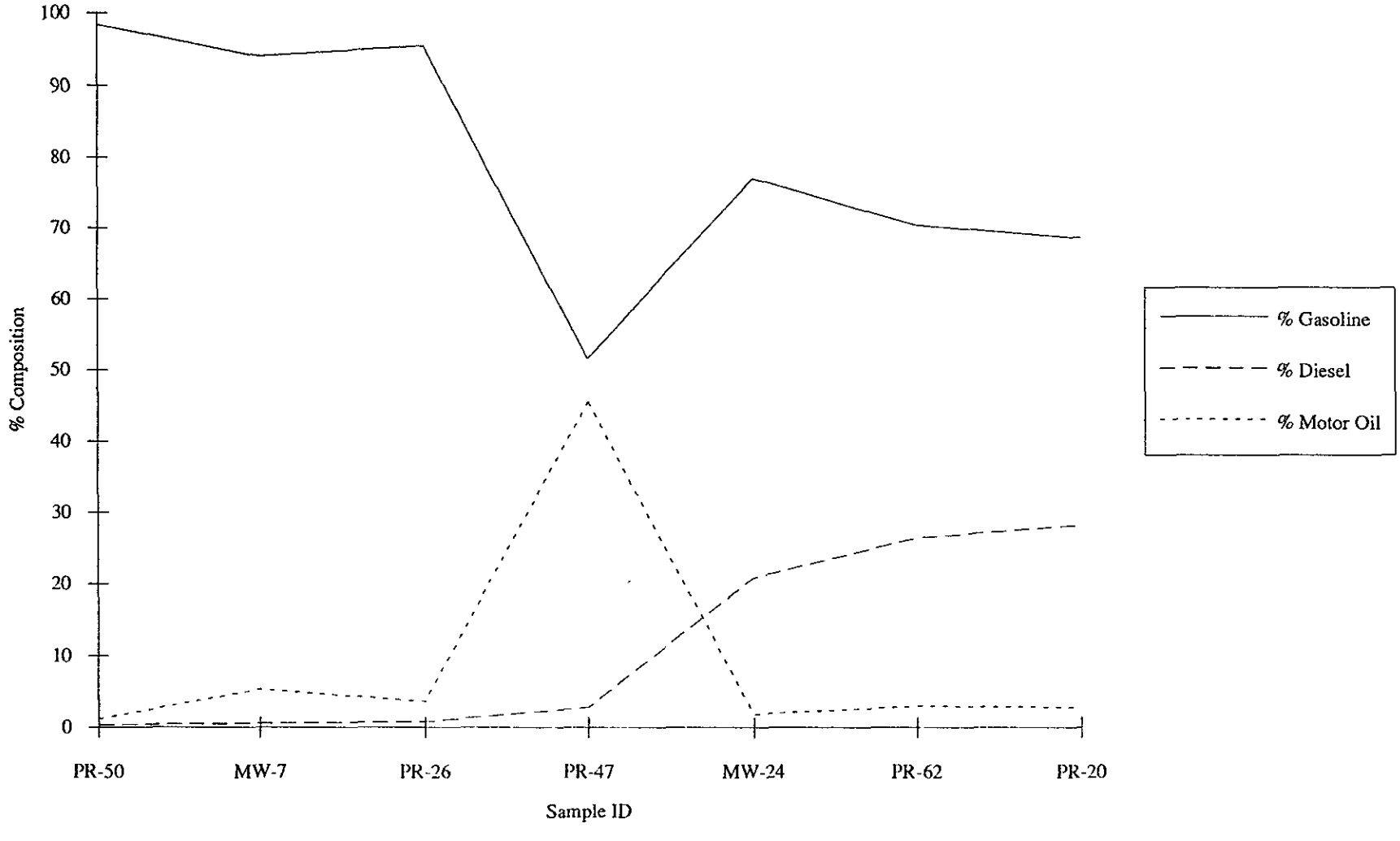
% Fuel Hydrocarbons vs. Sample ID (Sorted by increasing oil concentration)



% Fuel Hydrocarbons vs. Sample ID (sorted by increasing gasoline concentration)



% Fuel Hydrocarbons vs. Sample ID (sorted by increasing diesel concentration)



SIERRA LABORATORIES
Sierra Laboratories, Inc.
1525 Endeavor Place
Suite D
Anaheim, CA 92801

714 - 758-9988
FAX: 714 - 758-9692

SF 33[illegible]2

CHAIN OF CUSTODY RECORD

Date: 10-20-92 Page 1 of 1

Client: PARK ENV CORP
Address: 2140 Professional Drive Suite 130 Roseville CA 95661
Client Tel. No.: 916 782 8980
Client Proj. Mgr.: P. Frank

Client Proj. Name:
Client Proj. No.: 1137 J1

For Client Use:
Turn around requested:
- ____ Immediate Attention
- ____ Rush 24-48 hours
- ____ Rush 72-96 hours
- ____ Mobile Lab
- X Normal

Analyses Requested

Client Sample No.	Date	Time	Sample Matrix: Liquid	Sample Matrix: Solid	Preservatives: Yes	Preservatives: No	Container: Type	No. of Containers	FUEL FINGERPRINT	Remarks
PR 26	10-20		X		X		Glass	2	X	
MW 24	↓		↓		↓		↓	↓	X	
PR 20									X	
PR 62									X	FREE PRODUCT
MW-7									X	
PR-50									X	
PR-47	↓		↓		↓		↓	↓	X	

Sampler's Signature: Peter Frank

Relinquished by	Date	Time	Received by	Date	Time
Peter Frank	10-20	115	Deborah Dmitz	10-20	133
Relinquished by:	Date	Time	Received at Laboratory by:	Date	Time

Received by: | Date | Time

14 Total No. of Containers

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analysis specified above under Sierra's Terms and Conditions, unless otherwise agreed upon in writing between Sierra and Client.

Total No. of Containers Recd.: 14

Special Instructions:

FOR LABORATORY USE ONLY — Condition samples received:
- ✓ Chilled
- ✓ Intact
- N/A Appropriate Preservatives
- ✓ Appropriate Sample Container
- ✓ Properly Labeled
- ____ Other

SITE SAFETY PLAN

INTRODUCTION

A Site Safety Plan (SSP) has been designed to address safety provisions needed during the site remediation. Its purpose is to provide established procedures to protect all on-site personnel from health hazards related to hazardous materials that may be encountered at the site and from hazards associated with the installation and operation of the vapor extraction treatment system. The SSP establishes personnel responsibilities, personal protective equipment standards, decontamination procedures, and emergency action plans. This SSP describes means for protecting all on-site personnel from deleterious contamination or personal injury while conducting on-site activities. As described below, we will strive to meet all requirements promulgated by the California Department of Health Services.

SITE BACKGROUND

The Carnation Dairy Facility (facility) occupies two square city blocks. The north and south portions of the facility are bounded by 16th and 14th street respectively. The former 15th street is abandoned and at one time was located through the facility. The western side of the property is bounded by Cypress Street and eastern side is bordered by Poplar Street (Figure 1 of Appendix A).

The area surrounding the facility is mostly industrial with several residential dwellings present. The site is generally flat, but has a slight slope to the west. The entire site has buildings or is paved with asphalt or concrete.

The area of environmental concern lies in the north western corner of the facility where an "L" shaped vehicle maintenance building is situated. The building has a warehouse area, a small office and vehicle service bays.

Historically, the facility was constructed by American Creamery in 1915. Carnation Company acquired the property in 1929 and subsequently made additions to the existing building structures between 1946 and 1973 for dairy product processing and distribution. The area of environmental concern contained underground fuel storage and waste oil storage tanks. All the tanks in this area have been removed (Harding Lawson Associates, September 1991). The facility has not been in operation since March, 1991.

SITE REMEDIATION

The site remediation will include the removal of free product from the groundwater surface and petroleum hydrocarbons from soil in the vadose and capillary zones. The remediation will utilize vapor extraction of hydrocarbon laden soil vapors, and vapor treatment in a thermal oxidation unit.

The vapor extraction unit is equipped with safety devices to ensure safe operation of the equipment and safe conditions for the public. In the event of malfunction of the thermal oxidizer, the unit will shut off electricity to the vapor extraction pumps and heating elements. Under no circumstances will untreated soil vapors be vented to the atmosphere. The treated vapors exiting the unit are monitored as per BAAQMD requirements to assure public safety from exposure or explosion. No combustible materials are utilized in the treatment process or stored on-site, minimizing risk of fire or explosion.

RESPONSIBILITIES OF KEY PERSONNEL

All personnel on-site will have assigned responsibilities. Mr. Peter Frank will serve as Project Manager/Geologist. Mr. Mark Eklund will serve as Construction Supervisor and Site Safety Officer (SSO). As SSO, Mr. Eklund will assure that all on-site personnel have received a copy of SSP. Mr. Eklund will also be responsible for keeping field notes, collecting and securing samples, and assuring sample integrity by adherence to Chain of Custody protocol. All personnel will be required to document their full understanding of the SSP before admission to the site. Compliance with SSP will be monitored at all times by the SSO. Provisions of this SSP are mandatory and all personnel associated with on-site activities will adhere strictly hereto. Appropriate personal protective equipment, listed below, will be available and utilized by all on-site personnel. Prior to beginning work, the SSO will conduct a training session to assure that all are aware of safe work practices. In the training session, personnel will be made aware of hazards at the site and will utilize Material Safety Data Sheets for information on compounds to be encountered. All on-site employees will take reasonable precautions to avoid unforeseen hazards. After documenting full understanding of the SSP, each on-site employee will be responsible for strict adherence to all points contained herein. Any deviation observed will be reported to the SSO and corrected. On-site employees are held responsible to perform only those tasks for which they believe are qualified.

JOB HAZARD ANALYSIS

Hazards likely to be encountered on-site include those commonly encountered when operating any mechanical equipment, such as the danger of falling objects or moving machinery. Simple precautions will reduce or eliminate risks associated with operating such equipment.

All on-site personnel are required to wear hard hats when in close proximity to construction equipment. Proper respiratory equipment will be worn if vapor contamination levels on-site exceed action levels as determined by using a Photo-Ionization Detector (PID). Furthermore, no on-site smoking, open flame, or sparks will be permitted to prevent accidental ignition.

RISK ASSESSMENT SUMMARY

Exposure to chemicals anticipated on-site include benzene, toluene, and xylene (BTEX). These chemicals represent a hazard because they are moderately hazardous and most are highly flammable. Threshold Limit Values (TLV's), Short Term Exposure Limits (STEL's), and Toxicity levels (LD50, oral-rat), all in mg/kg (ppm), are listed below:

Compound	TLV	STEL	Toxicity
Benzene	10	25	4894
Toluene	100	150	5000
Xylene	100	150	4300

EXPOSURE MONITORING PLAN

A Photo-Ionization Detector (PID) will be used to monitor vapor concentrations around the site. This monitoring will take place continuously in the breathing area of on-site workers (approximately 5-feet above ground surface). In the event that vapor concentrations are detected in the work zone, monitoring will be conducted at 30-minute intervals along the periphery of the work zone to assure safety to people outside of the designated work zone. Should concentrations exceed TLV's, protective measures will be taken. As no liquid chemicals will be stored or processed on-site, no measures will be required for the inadvertent release of liquid hazardous materials. Field measurements will be recorded and maintained on-site and available to HMMD or other local agencies.

PERSONAL PROTECTIVE EQUIPMENT

All personnel on-site will have access to respirators with organic vapor cartridges. Replacement cartridges will be available on-site as needed. Hard hats will be worn by all personnel on-site when in proximity of construction equipment.

WORK ZONES AND SECURITY MEASURES

Access to the working zone site will be restricted to authorized personnel. A set of cones, placards, or wide yellow tape, surrounding the site will define the perimeter during field operations. During remediation, all equipment will be secured behind a fully enclosed, locked, chain-link enclosure or building structure. Permanently affixed to this enclosure will be placards with emergency contacts, location of safety equipment, and Proposition 65 warning signs that

notify the public that chemicals known to the State of California to cause cancer are present on the site.

The Project Manager will be responsible for site security and will have authorization to shut down the system if required, and will notify the proper agency immediately.

It is not anticipated that any off-site risks will be encountered. In the event that additional precautions will be necessary, this plan will be updated to include such changes.

DECONTAMINATION MEASURES

Avoidance of contamination whenever possible is the best method for protection. All personnel will be advised to wash their hands, neck, and face with soap and water before taking a break or leaving the site. Respirators will be washed with soap and water following each day's use.

GENERAL SAFE WORK PRACTICES

Personal safety and hygiene should be of utmost consideration while on-site. To prevent ingestion of contaminants no person shall be allowed to eat, drink, or smoke on the site. The Site Safety Officer will designate an appropriate nearby area.

STANDARD OPERATING PROCEDURES

On-site personnel will be briefed daily in "tailgate" meetings as to the day's goals and equipment to be used. Anticipated contaminants and emergency procedures will be reviewed. Appropriate personal protective equipment will be put on and verified correct by SSO, including respirator fit.

TRAINING REQUIREMENTS

The SSO will conduct a pre-site training session which will include all points of MSDS forms, contaminant properties, warning signs, health hazard data, risks from exposure, and emergency first aid. All chemicals will be covered and the SSO will assure that everyone fully understands site hazards.

MEDICAL SURVEILLANCE PROGRAM

According to CFR 29, 1910.120, Paragraph (f), employees who wear respirators 30 days or more during one year or who have been exposed to hazardous substances or health hazards above established permissible exposure limits are required to be monitored medically. All site personnel will be required to have had a complete chemical physical within the past year.

RECORD-KEEPING

Documentation will be kept on all personnel exposed to contaminant hazards on the job site according to OSHA regulations. These will include documentation that employees have received training on the SSP, respiratory protection, MSDS forms, and all emergency procedures. These will be reviewed during the pre-site training meeting.

Exposure records on each job will be kept for 30 years to meet requirements. Included will be names and Social Security numbers of employees, medical evaluations, on-the-job logs from entry to exit, first aid administered, visits on-site by outside persons, and personal air monitoring records.

PERTINENT DATA

In the event of accident, injury, other emergency, or public nuisance, the following information is included:

Police, Fire, or Ambulance emergency: 911

Hospital:

Peralta Hospital
450 30th Street
Oakland, California
(510) 451-4900

PARK ENVIRONMENTAL CORPORATION Contacts:

Project Manager/Geologist: Mr. Peter Frank (916) 782-8980
Site Safety Officer: Mr. Mark Eklund (714) 777-1001
2140 Professional Drive, Suite 130
Roseville, California 95661

County of Alameda (DEH) Contact:

Ms. Jennifer Eberle (510) 271-4530

Bay Area Air Quality Management District (BAAQMD) Contact:

(415) 771-6000