A Report Prepared for

Exxon Company, USA
P.O. Box 4032
Concord, California 94524

sep 1991

SITE SAFETY PLAN
EXXON STATION #7-0104
1725 PARK STREET
ALAMEDA, CALIFORNIA

HLA Job No. 04167,392.02

by

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Senior Geologist

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September 4, 1991

ORIGINAL SHSP

- ALL APPROVALS, REVISIONS AND PERSONNEL SIGNATURES MUST BE MADE TO THIS ORIGINAL.
- SEND A FULLY EXECUTED COPY TO THE DHSO WHEN PROJECT IS COMPLETED (CLOSED)
- RETAIN THIS MASTER IN CLOSED JOB FILE.

DHSO Signature James Watters Date 9/11/91

Harding Lawson Associates (HLA)
SITE SAFETY PLAN

This Site Safety Plan is specifically prepared for:

Project Location Exxon Alameda, 1725 Park Street, Alameda, California

Job Number 04167.392.02

ALL PERSONNEL PARTICIPATING IN THE FIELD MUST BE TRAINED IN THE GENERAL AND SPECIFIC HAZARDS UNIQUE TO THE JOB AND, IF APPLICABLE, MEET RECOMMENDED MEDICAL EXAMINATION REQUIREMENTS. ALL SITE PERSONNEL AND VISITORS SHALL FOLLOW THE GUIDELINES, RULES, AND PROCEDURES CONTAINED IN THIS SAFETY PLAN. THE PROJECT MANAGER OR SITE SAFETY OFFICER MAY IMPOSE ANY OTHER PROCEDURES OR PROHIBITIONS THAT THEY BELIEVE ARE NECESSARY FOR SAFE OPERATIONS.

THIS PLAN IS PREPARED TO INFORM ALL FIELD PERSONNEL, INCLUDING HLA CONTRACTORS AND HLA SUBCONTRACTORS, OF THE POTENTIAL HAZARDS ON THE SITE. HOWEVER, EACH CONTRACTOR OR SUBCONTRACTOR MUST ASSUME DIRECT RESPONSIBILITY FOR HIS OWN EMPLOYEES' HEALTH AND SAFETY.

TABLE OF CONTENTS

I. INTRODUCTION

A. SITE LOCATION: Exxon Station #7-0104, 1725 Park Street, Alameda, CA

B. PLAN PREPARED: S Michelle Watson — 9/4/91
S. Michelle Watson — Date

C. PLAN APPROVED: S Michelle Watson — 9/4/91
Project Manager — Date
S. Michelle Watson

James Slattery — 9/4/91
DHSO — Date
James Slattery

D. PLAN REVISED: _____ — _____
Name — Date

E. REVISION APPROVED: _____ — _____
Project Manager — Date

_____ — _____
DHSO — Date

F. THE POSSIBLE HAZARDS ON THIS JOB ARE EXPECTED TO BE:

Gasoline contaminated soil and groundwater, mechanical, electrical

G. REQUIRED PERSONAL PROTECTIVE ITEMS AND EQUIPMENT FOR THIS PROJECT:

Level D or Level C depending on the results of air monitoring

II. PERSONS RESPONSIBLE AND INVOLVED

A. PROJECT MANAGER S. Michelle Watson

Health and Safety Responsibilities Responsible for ensuring all project tasks and personnel comply with applicable regulations as defined in this site safety plan.

B. SITE SUPERVISOR

Health and Safety Responsibilities Responsible for ensuring all provisions of the site safety plan are fully implemented as project tasks are performed.

C. SITE SAFETY OFFICER Chris Corpuz

Health and Safety Responsibilities Assist project manager/site supervisor in the selection of proper controls to minimize hazard exposure to personnel, work site, and adjacent sites.

D. OTHERS

Health and Safety Responsibilities

E. SUBCONTRACTORS Drillers; Treatment System Installation Sub.

Health and Safety Responsibilities All Subcontractors will be responsible for their own worker training and medical monitoring and for maintaining the safety procedures as outlined in this site safety plan.

III. FACILITY BACKGROUND

A. FACILITY BACKGROUND AND DESCRIPTION: The site is an active gasoline service station and convenience store.

B. SITE HISTORY (USE OF SITE, ORIGIN OF CONTAMINATION): Contamination discovered during station remodeling in 1986.

C. HAZARDOUS INCIDENCE HISTORY (HISTORY OF INJURIES, EXPOSURE, CHEMICAL SPILLS, COMPLAINTS, ETC.): High dissolved concentrations of gasoline constituents are known to exist in soil and groundwater at the site.

D. PURPOSE OF ACTIVITY/OBJECTIVE OF HLA's WORK (CHARACTERIZATION, REMEDIAL ACTIONS, EXCAVATION, TRENCHING; INCLUDE LOCATION WITH RESPECT TO AREAS OF KNOWN OR SUSPECTED CONTAMINATION): HLA will be installing extraction wells and a treatment system at the site.

E. SITE STATUS (ACTIVE, INACTIVE, UNKNOWN): Active

F. SURROUNDINGS (LOCATION WITH RESPECT TO CITY, ROADS, RESIDENCES, BUSINESSES, NATURAL FEATURES, GRADIENTS, TANKS, ETC.): Site is located on the corner of Park and Eagle Streets and is surrounded by residential and commercial facilities.

G. SITE MAP (ATTACHED MAP AT END OF THIS PLAN SHOWING SALIENT FEATURES, INCLUDING LOCATION OF HLA'S WORK AND LOCATION OF CONTAMINATED AREAS).

H. CLIMATE

AVERAGE WIND SPEED AND DIRECTION: 15 mph west

	July	October	January	April
MEAN HIGH TEMPERATURE			56	
MEAN LOW TEMPERATURE			38	

IV. IDENTIFIED CHEMICAL CONTAMINANTS

A. IDENTIFIED CHEMICAL CONTAMINANTS KNOWN TO BE PRESENT

List chemical contaminants that have been identified, their concentration, and the environmental media in which they are present. Hazardous property information for selected chemicals appears in the appendix. Review this information for all chemicals listed below. If chemicals are not listed in the appendix, you must enter the hazardous property information in the appendix in the spaces provided.

Chemical	Environmental Media (Enter Code)	Measured Concentration Minimum	Maximum
TPH - Gasoline	Soil	ND	2,600 mg/kg
Benzene	Soil	ND	6,900 µg/kg
Toluene	Soil	ND	32,000 µg/kg
Ethylbenzene	Soil	ND	32,000 µg/kg
Xylenes	Soil	ND	150,000 µg/kg
TPH - Gasoline	GW	1.7	180 mg/l
Benzene	GW	9	12,000 µg/kg
Toluene	GW	2.9	55,000 µg/kg
Ethylbenzene	GW	ND	5,600 µg/kg
Xylenes	GW	27	28,000 µg/kg

B. SUSPECTED CHEMICAL CONTAMINANTS ON SITE

List chemical contaminants that are suspected to be present.

Chemical	Environmental Media
Known contaminants listed above	

Code for environmental media:

Sl	Sludge
GW	Groundwater
SW	Surface water
LW	Liquid waste
So	Soil
A	Air
Other -	Specify

C. CHEMICAL CONTAMINANTS CHARACTERIZATION

Has the site been adequately characterized to the best of your knowledge?

Yes __X__ No _____

If yes, list applicable references or previous reports/studies.

HLA, 1990. *Phase III Evaluation of Petroleum Hydrocarbons, Exxon Station #7-0104, 1725 Park Street, Alameda, California.* May 1.

V. GENERAL WORK PRACTICES

- No one will be permitted to engage in work operations alone.

- Smoking, eating, drinking, chewing gum or tobacco will not be permitted within the work zones.

- Personnel should keep track of weather conditions and wind direction to the extent they could affect potential exposure.

- Personnel should be alert to any abnormal behavior on the part of other workers that might indicate distress, disorientation, or other ill effects.

- Personnel should never ignore symptoms which could indicate potential exposure to chemical contaminants. These should be immediately reported to their supervisor or the Site Safety Officer.

- Others (specific to tasks, i.e., trenching safety, drill rig safety, site entry, etc.)

VI. SITE CONTROL/WORK ZONES

A. DESCRIBE LOCATION OF EXCLUSION ZONE, HOT LINE, CONTAMINATION REDUCTION ZONE, AND DECONTAMINATION AREA AND SUPPORT ZONE. SHOW LOCATIONS ON SITE PLAN.

Zones will change with work area. Exclusion zone will be delineated with flagging.

B. DEFINE THE SITE CONTROL/SECURITY MEASURES (I.E., FENCING, LOCKED GATES, KEYS, SECURITY GUARDS, FLAGGING, ETC.

Site control will be maintained with barricades and flagging.

C. DESCRIBE SAFETY PLAN LOCATIONS.

The site safety plan will be provided to onsite personnel including, but not limited to, the project manager, subcontractors, and client. The HLA representative onsite will maintain a safety plan at the site at all times.

VII. SITE RESOURCES

SITE RESOURCES LOCATIONS

Toilet facilities: Onsite

Drinking water supply: Bottled and onsite

Telephone: Onsite/mobile phone

Radio: N/A

Other: N/A

VIII. HAZARD ANALYSES

List all activities in the Job Activity Column and assign a number to each activity (example: 1. Ground Water Sampling)

Identify how each category of hazard exists at each activity.

Activity Number	Job Task	Mechanical	Electrical	Chemical	Temperature	Acoustical	Radioactive	02 Deficiency-Confined Space	Biohazard
1.	Drilling and Well Installation	Rig Equip., materials handling	Overhead and/or buried power lines	Contaminated soil and groundwater	Heat stress	Rig noise	NE	NE	NE
2.	Equipment Decontamination	Heavy materials handling	Steam cleaner	Contaminated soil and groundwater	Heat stress	Compressor noise	NE	NE	NE
3.	Well Sampling and Development	Pumping equipment	NE	Contaminated soil and groundwater	Heat stress	Pump noise	NE	NE	NE
4.	Treatment System Installation	Heavy equipment	Wiring of control panel/pumps	NE	Heat stress	NE	NE	NE	NE

IX. HAZARD MITIGATION

Identify procedures to mitigate all hazards listed in Section VI by placing the task number next to the appropriate mitigating measure. Listing of standard procedures is not inclusive. A specific procedure must be entered to mitigate each hazard identified in Section VI.

Activity List Number	A. Mechanical Hazards
All	Do not stand near backhoe buckets and earthmoving equipment.
All	Verify that all equipment is in good condition.
All	Do not stand or walk under elevated loads or ladders.
All	Do not stand near unguarded excavation and trenches.
NE	Do not enter excavation or trenches over 5 feet deep that are not properly guarded, shored, or sloped.
All	Consult DHSO if other mechanical hazards exist.

	B. Electrical Hazards
1	Locate and mark buried utilities before drilling.
	Utilities located by: USA on
All	Maintain at least 10-foot clearance from overhead power lines.
All	Contact utility company for minimum clearance from high voltage power lines.
All	If unavoidably close to buried or overhead power lines, have power turned off, with circuit breaker locked and tagged.
All	Properly ground all electrical equipment.
All	Avoid standing in water when operating electrical equipment.
All	If equipment must be connected by splicing wires, make sure all connections are properly taped.
All	Be familiar with specific operating instructions for each piece of equipment.

	C. Chemical Hazards
1, 2, 3	Use personal protective equipment indicated in Section 18.
1, 2, 3	Conduct direct reading air monitoring to evaluate respiratory and explosion hazards (list instrument, action level, monitoring location, and action to be taken in Section 19).
1, 2, 3	Consult DHSO for personal air monitoring.

NE = NOT EXPECTED

D. Temperature Hazards

1. Heat Stress

All	When temperature exceeds 70°F, take frequent breaks in shaded area. Unzip or remove coveralls during breaks. Have cool water or electrolyte replenishment solution available. Drink small amounts frequently to avoid dehydration. Count the pulse rate for 30 seconds as early as possible in the rest period. If the pulse rate exceeds 110 beats per minute at the beginning of the rest period, shorten the work cycle by one-third.

E. Acoustical Hazards

All	Use earplugs or earmuffs when noise level prevents conversation in normal voice at distance of 3 feet.

F. O_2 Deficiency - Confined Space Hazards - Not Expected

G. Radiation Hazards - Not Expected

H. Biohazards - Not Expected

NE = NOT EXPECTED

X. AIR MONITORING

Air monitoring should be conducted with instruments selected to measure contaminants that employees may be exposed to. Measurements should be taken within the breathing zones of workers. If action levels are reached for a 1-minute reading, appropriate action must occur.

A. GASES AND VAPORS

Instrument & Date of Calibration	Calibration Gas Standard	Frequency/ Duration of Air Monitoring	Action Level (a)(b) Above Background (Breathing Zone)	Action
OVA	Methane	Continuous	1 ppm for 1 minute duration	Introduce engineering controls (i.e., blower fans) (Level D)*
OVA	Methane	Continuous	5 ppm for 1 minute	Don respirator (Level C)
OVA	Methane	Continuous	50 ppm for 2 minutes	Leave area (Level C)
				Upgrade to Level B
				Upgrade to Level A

(a) Action Levels for "known contaminants" should be based upon the contaminants Permissible Exposure Level (PEL) or Threshold Limit Values (TLVs).

(b) Action levels for unknown contaminants are based upon the following:

HNu or OVA Measurements in Breathing Zone
Reading for 1 minute

Background	Level D
>0-5 ppm above background	Level C
5-500 ppm above background	Level B
500-1000 ppm above background	Level A

Comments: * If 1 ppm for 1 minute duration on OVA, use Draeger tube to sample for benzene. If benzene >0.5 ppm, don 1/2 mask respirator with organic vapor cartridges. If no benzene is detected, don 1/2 mask respirator when OVA indicates 5 ppm for 1 minute. If benzene is detected, maximum use concentration for 1/2 mask is 10 ppm benzene, full face is 50 ppm benzene, >50 ppm upgrade to Level B.

B. EXPLOSION HAZARD

Instrument & Date of Calibration	Action Level Above Background (Ambient Air)	Frequency/Duration of Air Monitoring	Action
Combustible gas indicator	Greater than 20% LEL	_____	Leave area
_____	_____	_____	_____
_____	_____	_____	_____

C. OXYGEN DEFICIENCY

Instrument & Date of Calibration	Action Level (Ambient Air)	Frequency/Duration of Air Monitoring	Action
O_2 meter	Less than 19.5% O_2 More than 23% O_2	_____	Do not enter
_____	_____	_____	_____
_____	_____	_____	_____

D. OTHER INSTRUMENTS

Instrument & Date of Calibration	Action Level (Breathing Zone/ Ambient Air)	Duration/Frequency of Air Monitoring	Action
Date			
Draeger pump/tubes Benzene	0.5 ppm	_____	Don half face
	_____	_____	respirator.

XI. REQUIRED PERSONAL PROTECTIVE AND RELATED SAFETY EQUIPMENT

Place the activity number from Section VI next to each item of personal protective equipment required for that task. All personal safety equipment must meet ANSI standards or equivalent.

LEVEL: ____ A ____ B _X_ C _X_ D

Comments: Level of PPE will be modified based on air monitoring results.

Head

All	Hardhat				

Eye/Face

1,2,3	Safety Glasses	____	Faceshield
____	Chemical Goggles		

Hand

1,2,3	Neoprene	____	Nitrile	____	PVC
____	Viton	____	Underglove	____	Other = ____

Body

____	Full Encapsulating Suit: ____
____	Two Piece Rainsuit, Material = ____
____	One Piece Splash Suit, Material = ____
1, 2, 3	Hooded Tyvek Suit
____	Hooded Tyvek/Saranax Suit
____	Hooded Tyvek/Polyethylene Suit
____	Cloth Coveralls
____	High Visibility Vest
____	Other ____

Lung

____	SCBA (open circuit, pressure demand): ____
____	Full Face Respirator, cartridge = ____
____	Supplied Air, Airline
1, 2, 3	Half Mask Respirator, cartridge = Organic vapor, high efficiency filter
____	Other ____

Ear

1, 2, 3, 4	Earplug, type = Foam or molded ear inserts
____	Earmuff, type = ____

Foot

1, 2, 3, 4	Steel-toed Boots, type = Neoprene or work boots with overbooties
____	Disposable Overboots, type = ____

Other Safety Equipment

1, 2, 3	Ventilation blower/fan		
All	Traffic cones	_____	Lifeline harness
All	Barrier tape	_____	Radiation Dosimeter
_____	Blast alarm		
_____	Ground fault circuit interrupter		

Comments: _____

XII. DECONTAMINATION PROCEDURES

A. EQUIPMENT (SAMPLING, CONSTRUCTION, ETC.) DECONTAMINATION (SOLVENTS USED, EQUIPMENT USED, METHOD OF DISPOSAL). ATTACH SITE DECONTAMINATION MAP AS NECESSARY.

Augers will be steam cleaned prior to transport to the site and between borings. Soil sampling equipment will be washed in Labtone soap and rinsed between samples.

B. PERSONNEL DECONTAMINATION (SOLVENTS USED, METHOD OF SOLVENT DISPOSAL; INCLUDE DECONTAMINATION METHOD OF PPE AND DISPOSAL OF PPE). ATTACH DECONTAMINATION MAP AS NECESSARY.

PPE removed and disposed at end of shift. Reuseable protective clothing will be decontaminated onsite. Disposable protective clothing and spent respirator cartridges will be drummed onsite. Respirators will be decontaminated nightly. Hands will be washed with soap and water at all breaks.

C. INVESTIGATION-DERIVED MATERIAL DISPOSAL

1. Drill cuttings/well water: Contained in labeled 55-gallon drums and disposed properly based on analytical results.

2. Decontamination solutions: Contained in labeled 55-gallon drums and disposed properly based on analytical results.

3. Other: _____

XIII. DOCUMENTATION

HLA PERSONNEL TRAINING AND MEDICAL RECORDS ARE MAINTAINED AT HLA - NOVATO OFFICE. RECORDS WILL BE MAINTAINED ON SITE AS NECESSARY.

A. PROJECT PERSONNEL LIST AND SAFETY PLAN DISTRIBUTION RECORD

1. HLA Employees

All project staff must sign, indicating they have read and understand the Site Safety Plan. A copy of this Site Safety Plan must be made available for their review and readily available at the job site.

Employee Name/Job Title	Date Distributed	Signature

2. Contractors, Subcontractors

A copy of this safety plan shall be provided to contractors and subcontractors who may be affected by activities covered under the scope of this Site Safety Plan. All contractors and subcontractors must comply with applicable OSHA, EPA, and local government rules and regulations.

Firm Name	Contact Person	Date Distributed

B. HEALTH AND SAFETY MEETING - ALL PERSONNEL PARTICIPATING IN THE PROJECT MUST RECEIVE INITIAL HEALTH AND SAFETY ORIENTATION. THEREAFTER, A BRIEF TAILGATE SAFETY MEETING IS REQUIRED AS DEEMED NECESSARY BY THE SITE SAFETY OFFICER (OR AT LEAST ONCE EVERY 10 WORKING DAYS).

Date	Topics	Name of Attendee	Firm Name	Employee Initials

C. VISITOR - IT IS HLA's POLICY THAT VISITORS MUST FURNISH HIS/HER OWN PERSONAL PROTECTIVE EQUIPMENT. ALL VISITORS ARE REQUIRED TO SIGN THE VISITOR LOG AND COMPLY WITH THE SAFETY PLAN REQUIREMENTS. IF THE VISITOR REPRESENTS A REGULATORY AGENCY CONCERNED WITH SITE HEALTH AND SAFETY ISSUES, THE SITE SAFETY OFFICER SHALL ALSO IMMEDIATELY NOTIFY DHSO.

VISITOR LOG

Name of Visitor	Firm Name	Date of Visit	Signature

XIV. CONTINGENCY/EMERGENCY INFORMATION

A. REQUIRED EMERGENCY EQUIPMENT LOCATION

Safety shower/eyewash: In HLA vehicle
First aid kit: In HLA vehicle
Fire extinguisher: In HLA vehicle
Other: _____

B. EMERGENCY TELEPHONE NUMBERS

Ambulance:	911	
Police:	911	
Fire department:	911	
Hospital:		
Client contact:	Bill Wang 415/246-8768	
Poison Control Center:	(800) 233-3360	
in San Francisco:	(415) 821-8324	
CHEMTREC:	(800) 424-9300	
Project Manager (M. Watson)	Office 899-7366	Home 707/795-7392
DHSO (James Slattery)	Office 899-7337	Home 415/897-1516

C. * STANDARD PROCEDURES FOR REPORTING EMERGENCIES:

When calling for assistance in an emergency situation, the following information should be provided:

1. Name of person making call
2. Telephone number at location of person making call
3. Name of person(s) exposed or injured
4. Nature of emergency
5. Actions already taken

Recipient of call should hang up first--not the caller.

D. EMERGENCY ROUTES: ATTACH MAP SHOWING ROUTE TO NEAREST HOSPITAL. DESCRIBE NARRATIVELY THE ROUTE TO THE HOSPITAL. HAS HOSPITAL BEEN CONTACTED TO DETERMINE IF THEY WILL HANDLE A CHEMICAL EXPOSURE?

From site go northeast on Park over the tidal canal. Turn left (west) onto 14th Street. Oakland Hospital on right after 3 blocks.

E. CONTINGENCY PLANS AS APPROPRIATE: DESCRIBE CONTINGENCY PLANS FOR EMERGENCIES SUCH AS: FIRES, EMERGENCY CARE, INJURY, PPE, OR OTHER EQUIPMENT FAILURE. INCLUDE EMERGENCY SIGNALS AND EVACUATION ROUTES. IF FORMAL CONTINGENCY PLAN DOCUMENT HAS BEEN PREPARED, ATTACH A COPY.

Fire: Call 911. Small fires can be extinguished with a fire extinguisher by HLA or subcontractor personnel. Evacuate site if fire is out of control.
Chemical Exposure: Remove individual from area, upwind if possible. Wash the skin with water if skin contact has occurred. Wash eyes with emergency eyewash for 15 minutes if contamination has come in contact with eyes.

Transport victim to hospital; see attached map; or call 911. If calling hospital, ambulance, or poison control center, inform them that victim has been exposed to gasoline. If any of the above events occur, HLA will immediately notify appropriate personnel and perform assistance, as necessary. DO NOT transport people with neck or back injuries in company vehicles.

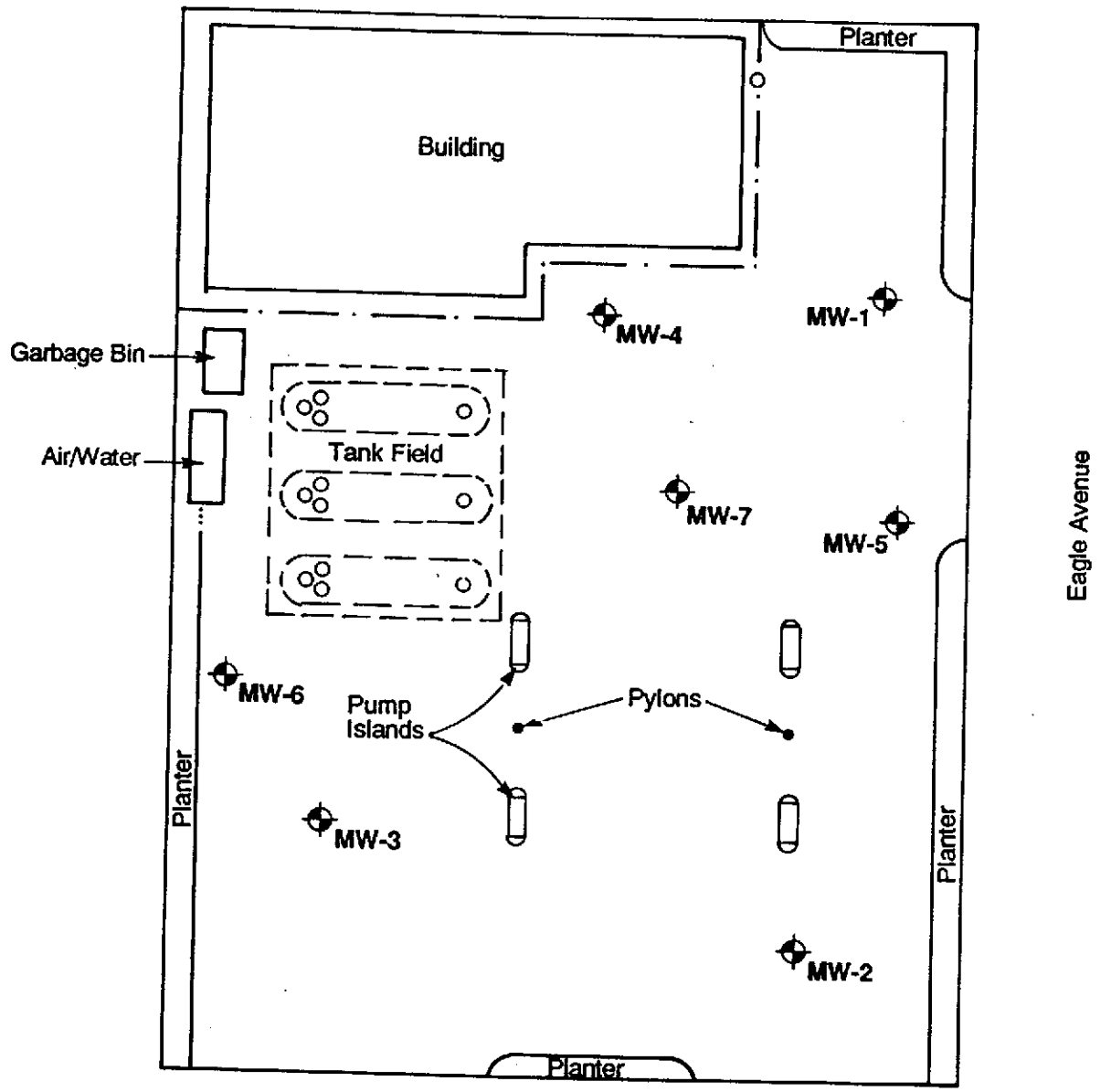
POST AT JOB SITE (AS APPROPRIATE)

Plate 1

SITE MAP

(INDICATE SALIENT FEATURES, LOCATION OF WORK, CONTAMINATED AREAS, EXCLUSION ZONE, HOT LINE, CONTAMINATION REDUCTION ZONE, DECONTAMINATION AREA, AND SUPPORT ZONE)

17388



EXPLANATION

⊕ Monitoring Well Location

N

0 20 40

APPROXIMATE SCALE IN FEET

Harding Lawson Associates
Engineering and Environmental Services

Site Plan
Site Safety Plan
Exxon Station #7-0104
Alameda, California

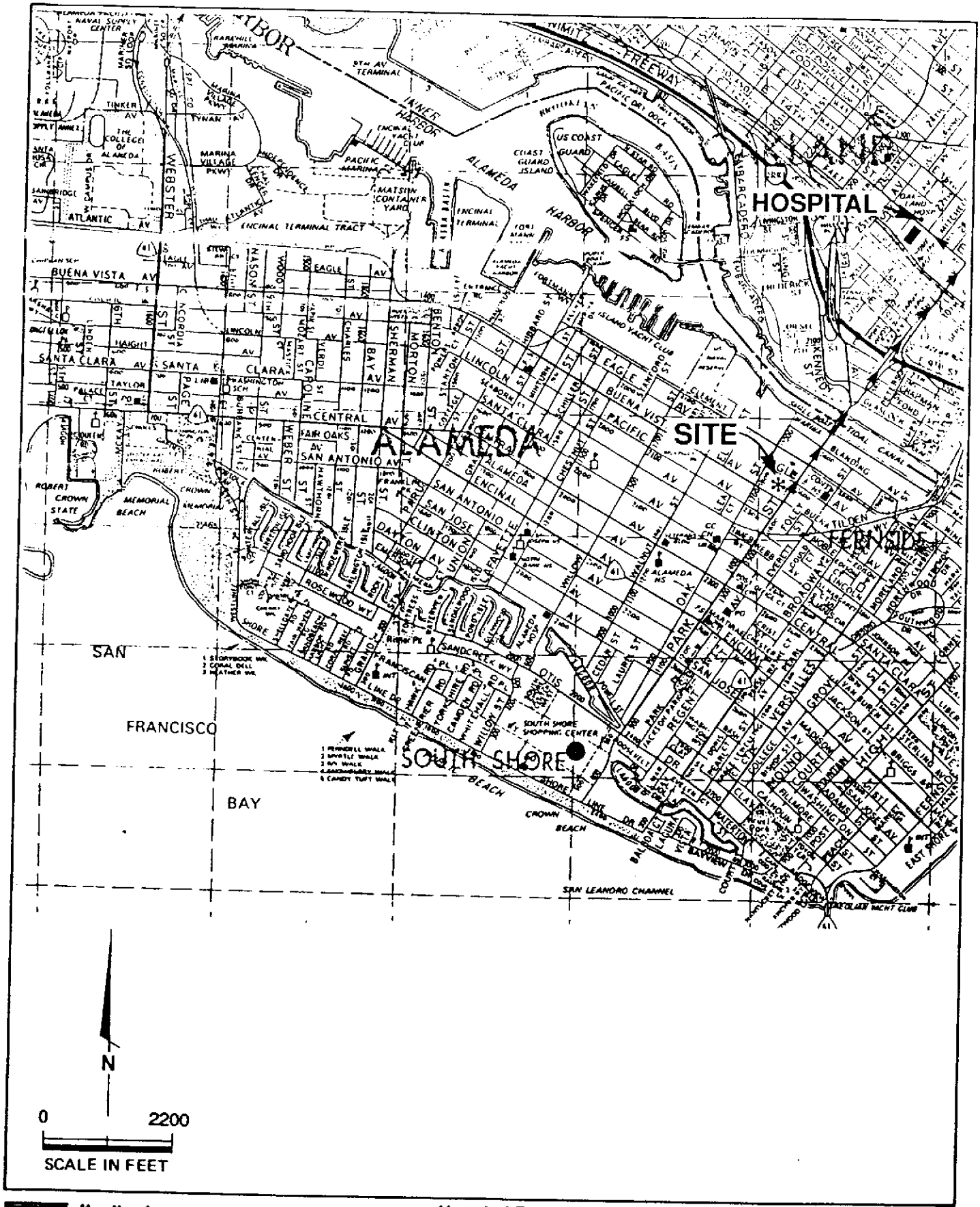
PLATE **1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
CVD	4167,392.02	[illegible]	9/91		

Plate 2

SITE MAP AND HOSPITAL ROUTE

17387



Harding Lawson Associates
Engineering and Environmental Services

Hospital Route
Site Safety Plan
Exxon Station #7-0104
Alameda, California

PLATE **2**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
CVD	4167,392.02		9/91		

Appendix A

HAZARDOUS PROPERTY INFORMATION

This appendix contains hazardous property information for selected compounds. Place a check mark next to each compound identified in Section IV, and review the hazardous property information for those compounds. If you have identified compounds in Section IV that are not listed in the appendix, you must list the compounds and enter the appropriate information.

(INCLUDE COPIES OF MATERIAL SAFETY DATA SHEETS FOR SELECTED COMPOUNDS IN ADDITION TO COMPLETION OF APPENDIX 1.)

HAZARDOUS PROPERTY INFORMATION

Check if present	Material	Water Solubility[a]	Specific Gravity	Vapor Density	Flash Point F	Vapor Pressure[e]	LEL UEL	LD_{50} mg/kg	TLV-TWA[g]	IDLN Level	Odor Threshold or Warning Concentration	Hazard[j] Property	Dermal[k] Toxicity	Acute[l] Exposure Symptoms
VOLATILE ORGANIC PRIORITY POLLUTANTS														
	Acrolein	22%	0.8410	1.9	-15	214 mm	2.8% 31%	46	0.1 ppm	5 ppm	0.1-16.6 (0.21-0.5)	BCED	BJ	ABDFGHIKLMNO PQR
	Acrylyenitrile	7.1%	0.8060	1.8	30	83 mm	3% 17%	82	2 ppm	4,000 ppm	19-100	BCEGO	DIG	FGIKLMNOR
X	Benzene	820 ppm	0.8765	2.8	12	75 mm	0.339% 7/1%	3800	11 ppm	2,000 ppm	4.68	BCGO	CIG	BCDFHIKLMNOQ R
	Bromomethane	0.1 g	1.732	3.3	none	1.88 atm	13.5%c 14.5%		5 ppmh	2,000 ppm	no odor	CD		BCDEIJKLMNOQ R
	Bromodichloromethane	Insoluble	1.980	--	none	n/a	non flam	916	none established	none specified		CGO		BIMN
	Bromoform	0.01g	2.887	--	none	5 mm	non flam	1147	0.5 ppm	n/a	530	CED		BCDKLM
	Carbon Tetrachloride	0.08%	1.5967	5.3	none	91 mm	non flam	2800	5 ppmh	300 ppm	21.4-200	CD	JGH	ABCFGHKMO
	Chlorobenzene	0.01 g	1.1058	3.9	84	8.8 mm	1.3% 9.6%	2910	75 ppm	2,400 ppm	0.21-60	BCD	CIF	BCFIKLMNOPQR
	Chloroethane	0.6 g	0.8978	2.2	-58	1.36 atm	3.8% 15.4%		1000 ppm	20,000 ppm		BCD		BFHIKMNP
	2-Chloroethylvinyl Ether	Insoluble	1.0475	3.7	80	30 mm	--	250	none established	none specified		BCD		NIM
	Chloroform	0.8 g	1.4832	4.12	none	160 mm	non flam	800	10 ppmh	1,000 ppm	50-307 fatigue (>4096)	CD		BCDGIKLMN
	Chloromethane	0.74%	0.9159	1.8	32	50 atm	7.6% 19%		50 ppmh	10,000 ppm	10-100 no odor (500-1000)	BCD	DHF	ABCDEFGIJKLO QR
	Dibromochloromethane	Insoluble	2.451	--	--	--	--	848	none established	none specified		BCD		BFHIMNPQ
	1,1-Dichloroethane (DCA)	0.1 g	1.1757	8.4	22	182 mm	6% 16%	725	100 ppm	4,000 ppm	5 ppm	BCD		AGHIMNO

HAZARDOUS PROPERTY INFORMATION

Check if present	Material	Water Solubility[a]	Specific Gravity	Vapor Density	Flash Point F	Vapor Pressure[e]	LEL UEL	LD_{50} mg/kg	TLV-TWA[g]	IDLN Level	Odor Threshold or Warning Concentration	Hazard[j] Property	Dermal[k] Toxicity	Acute[l] Exposure Symptoms
	1,2-Dichloroethane	0.8%	1.2554	3.4	55	87 mm	6.2% 16%	670	10 ppmh	1,000 ppm	6 ppm	BCDG		BCFGOLMNQ
	1,1-Dichloroethylene (DCE)	2250 mg/l @77of	--	3.4	3	591 mm	7.3% 16.0%	200	5 ppmh	none specified		BCD		BIMN
	Trans-1,2-Dichloroethylene	Slightly soluble	1.2565	--	36	400 mm	9.7% 12.8%		none established	none specified	.0043 mg/l	BCD		ABFILOQ
	1,2 Dichloropropane	0.26%	1.583	3.9	60	40 mm	3.4% 14.5%	1900	75 ppm	2,000 ppm	50	BCD		ABGHIKMNO
	Cis-1,3-Dichloropropane	Insoluble	1.2	3.8	83	28 mm	5% 14.5%		1 ppmh	none specified		BCD		ABGIKLMNP
	Trans-1,3-Dichloropropane	Insoluble	1.2	3.8	83	28 mm	5% 14.5%		1 ppmh	none specified		BCD		ABGIKLMNP
X	Ethylbenzene	0.015 g	0.867	3.7	59	7.1 mm	1.0% 6.7%	3500	100 ppm	2,000 ppm		BCD	CIF	ABFHIKLMNPQR
	Methylene Chloride	Slightly soluble	1.335	2.9	none	350 mm	12%c unavailable	167	100 ppmh	5,000 ppm	25-320 (200)	CED	CIF	BCIKLMNPR
	1,1,2,2-Tetrachloroethane	0.19%	1.5953	5.8	none	5 mm	non flam		1 ppmh	150 ppm	3-5	CD		ABCFHIKLMNOQ
	Tetrachloroethylene	0.15 g/ml	1.6227	5.8	none	15.8 mm	non flam	8850	50 ppmh	500 ppm	4.68%-50 (160-690)	CD		ACFHIKLMNP
	1,1,1-Trichloroethane (TCA)	0.7 g	1.3390	4.6	none	100 mm	8.0%c 10.5%	10300	350 ppm	1,000 ppm	20-400 (500-1000)	BCED		ABEFHIKLNOP
	1,1,2-Trichloroethane	0.45	1.4397	4.6	none	19 mm	6%c 15.5%	1140	10 ppm	500 ppm	-0-	C		DEFGHIKMNOP Q
	Trichloroethylene (TCE)	0.1%	1.4642	4.5	90d	58 mm	12.5% 90%	4920	50 ppmh	1,000 ppm	21.4-400	BC		BFKLNOPQ
	Trichlorofluoromethane	0.11 g	1.494	--	none	0.91 atm	non flam		1000 ppm	10,000 ppm	135-209	CD		BFHKLQ

HAZARDOUS PROPERTY INFORMATION

Check if present	Material	Water Solubility[a]	Specific Gravity	Vapor Density	Flash Point F	Vapor Pressure[e]	LEL UEL	LD_{50} mg/kg	TLV-TWA[g]	IDLN Level	Odor Threshold or Warning Concentration	Hazard[j] Property	Dermal[k] Toxicity	Acute[l] Exposure Symptoms
X	Toluene	0.05 g	0.866	3.2	40	22 mm	1.3% 7.1%	5000	100 ppm	2,000 ppm	0.17-40 fatigue (300-400)	BC	BHE	DEFHIKLMNOPQ
	Vinyl Chloride	negligible	0.9100	2.24	-108	3.31 atm	3.6% 33%	500	1 ppm	none specified	260	BCEG	DJG	ABFHIKLMN
METALS														
	Arsenic	b	5.727	n/a	none	n/a	f		10 Âg/m^3	none specified		CEG	CJG	ACDGJMOQR
	Beryllium	b	1.85	n/a	none	n/a	f		2 Âg/m^3	none specified		C		IJMNR
	Cadmium	b	8.642	n/a	none	n/a	f	225	0.5 mg/m^3	40/mg^3		C		ABGHIKLMNQR
	Chromium	b	7.20	n/a	none	n/a	f		0.5 mg/m^{3}h	500/mg^3		C		FMNQ
	Copper	b	8.92	n/a	none	n/a	f		0.1 mg/m^3	none specified		C		FGIJMOQR
	Lead	b	11.3437	n/a	none	n/a	f		50 Âg/m^3	none specified		C		ACDFGKOQR
	Mercury	b	13.5939	7.0	none	0.0012 mm	f		50 Âg/m^{3}h	28 mg/m^3		C		AGLMNQ
	Nickel	b	8.9	n/a	none	n/a	f		1 mg/m^3	none specified		C		DGHLMNQ
	Silver	b	10.5	n/a	none	n/a	f		0.01mg/m^3	none specified		C		IN
	Thallium	b	11.85	n/a	none	n/a	f		0.01mg/m^3	20 mg/m^3		C	BG	ABGLNOQ
	Zinc	b	7.14	n/a	none	n/a	f		none established	none specified		C		DF

HAZARDOUS PROPERTY INFORMATION

Check if present	Material	Water Solubility[a]	Specific Gravity	Vapor Density	Flash Point F	Vapor Pressure[e]	LEL UEL	LD_{50} mg/kg	TLV-TWA[g]	IDLN Level	Odor Threshold or Warning Concentration	Hazard[j] Property	Dermal[k] Toxicity	Acute[l] Exposure Symptoms
MISCELLANEOUS														
	Asbestos	Insoluble	2.5	n/a	none	n/a	non flam		0.2-2 fibers/cc	none specified		CG		MN
	Cyanides	58-72%		n/a	none	n/a	non flam		5 mg/m^3			CE		FKLMPQ
	PCB (generic)	slightly	--	n/a	none	n/a	non flam		1.0 Âg/m^3i	none specified		CG		CHLPQ
	Phenol	8.4%	1.0576	3.2	175	0.36 mm	1.8% 8.6%	414	5 ppm	100 ppm	0.47-5 (48)	C		ABCDGIKMNOQR
X	Xylene	0.00003%	0.8642	3.7	84	9 mm	1.1% 7%	5000	100 ppm	10,000 ppm	0.5-200 (200)	BCD		ABFHIKLMNPQ
	Acetone	soluble	0.8	2.0	-4	400 mm	2.6% 12.8%	9750	750 ppm	10,000 ppm	100	BCD	DI	H
	Chromic Acid	soluble	1.67-2.82	n/a	none	n/a	non flam		none established	none specified		ACEG		GIH
	Diesel Fuel	insoluble	0.81-0.90	--	130	--	0.6-1.3 6-7.5		none established	none specified	0.08	BC	ABC	IN
X	Gasoline	insoluble	0.72-0.76	3.4	-45	variable	1.4% 7.6%		300 ppm	none specified	0.005-10 x 0.25	CD	AB	IN
	Kerosene	insoluble	0.83-1.0	--	100-165	5	0.7% 5.0%		none established	none specified	1.0	BCD	AB	IN

HAZARDOUS PROPERTY INFORMATION
EXPLANATIONS AND FOOTNOTES

Water solubility is expressed in different terms in different references. Many references use the term "insoluble" for materials that will not readily mix with water, such as gasoline. However, most of these materials are water soluble at the part per million or part per billion level. Gasoline, for example, is insoluble in the gross sense, and will be found as a discreet layer on top of the groundwater. But certain gasoline constituents, such as benzene, toluene, and xylene will also be found in solution in the groundwater at the part per million of part per billion level.

a. Water solubility expressed as 0.2 g means 0.2 grams per 100 grams water at 20°C.

b. Solubility of metals depends on the compound in which they are present.

c. Several chlorinated hydrocarbons exhibit no flash point in conventional sense, but will burn in presence of high energy ignition source or will form explosive mixtures at temperatures above 200°F.

d. Practically non-flammable under standard conditions.

e. Expressed as mm Hg under standard conditions.

f. Explosive concentrations of airborne dust can occur in confined areas.

g. Values for Threshold Limit Value-Time Weighted Average (TLV-TWA) are OSHA Permissible Exposure Limits except where noted in h and i.

h. TLV-TWA adopted by the American Conference of Governmental Industrial Hygienists, which is lower than the OSHA PEL.

i. TLV-TWA recommended by the National Institute for Occupational Safety and Health (NIOSH). A TLV or PEL has not been adopted by ACGIH or OSHA.

j.

A	-	corrosive
B	-	flammable
C	-	toxic
D	-	volatile
E	-	reactive
F	-	radioactive
G	-	carcinogen
H	-	infectious

k. Dermal Toxicity data is summarized in the following three categories:

Skin Penetration

-	A	-	negligible penetration (solid-polar)
+	B	-	slight penetration (solid-nonpolar)
++	C	-	moderate penetration (liquid/solid-nonpolar)
+++	D	-	high penetration (gas/liquid-nonpolar)

Systemic Potency

E	-	slight hazard - LD_{50} = 500-15,000 mg/kg lethal dose for 70 kg man = 1 pint-1 quart
F	-	moderate hazard - LD_{50} = 50-500 mg/kg lethal dose for 70 kg man = 1 ounce-1 pint
G	-	extreme hazard - LD_{50} = 10-50 mg/kg lethal dose for 70 kg/man = drops to 20 ml

Local Potency

H	-	slight - reddening of skin
I	-	moderate - irritation/inflamation of skin
J	-	extreme - tissue destruction/necrosis

I. Acute Exposure Symptoms

A	-	abdominal pain
B	-	central nervous system depression
C	-	comatose
D	-	convulsions
E	-	confusion
F	-	dizziness
G	-	diarrhea
H	-	drowsiness
I	-	eye irritation
J	-	fever
K	-	headache
L	-	nausea
M	-	respiratory system irritation
N	-	skin irritation
O	-	tremors
P	-	unconsciousness
Q	-	vomiting
R	-	weakness

EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

DATE ISSUED: 08/31/89
SUPERSEDES DATE: 06/01/89

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
EXXON EXTRA UNLEADED GASOLINE

PRODUCT CODE
015000 - 00270

CHEMICAL NAME
Motor Gasoline

CAS NUMBER
Complex Mixture
CAS Number not applicable

PRODUCT APPEARANCE AND ODOR
Clear colored liquid (typically red)
Gasoline hydrocarbon odor

MEDICAL EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Product is a variable complex mixture of components, principally hydrocarbons, blended to performance, rather than chemical, specifications and typically contains the following:		
This product typically contains:		
Naphtha, light cat	64741-55-5	
Naphtha, heavy cat	64741-54-4	
Naphtha, full range reformate	68919-37-9	
Naphtha, full range alkalate	64741-64-6	
Sweetened naphtha	64741-87-3	
Butane	106-97-8	
Proprietary Additives	Proprietary	

See Section E for Health and Hazard Information.

See Section H for additional Environmental information.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	BASIS
1	4	0	Recommended by Exxon

EXPOSURE LIMIT FOR TOTAL PRODUCT
100 ppm (300 mg/m3) for an 8-hour workday

BASIS
Recommended by Exxon. The American Conference of Governmental Industrial Hygienists (ACGIH) lists Threshold Limit Value (TLV) of 300 ppm (900 mg/m3) for an 8-hour workday; 500 ppm STEL.

The airborne benzene level shall not exceed 1 ppm for an 8-hour workday or 5 ppm for any 15 minute period.

OSHA Regulation 29 CFR 1910.1028

C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN
In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water.

INHALATION
If overcome by vapor, remove from exposure and call a physician immediately. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION
If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

UNUSUAL FIRE AND EXPLOSION HAZARD

EXTREMELY FLAMMABLE VAPORS CAN TRAVEL AND EXPLODE

FLASH POINT (MINIMUM)
EXTREMELY FLAMMABLE - Per DOT 49 CFR 173.115
Approximately -38°C (-36°F)

AUTOIGNITION TEMPERATURE
Approximately 456°C (853°F)
National Fire Protection Association's Guide on Hazardous Materials

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity	BASIS
1	3	0	Recommended by the National Fire Protection Association

HANDLING PRECAUTIONS
This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

Keep product away from ignition sources, such as heat, sparks, pilot lights, static electricity, and open flames.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 1.4% Upper Flammable Limit 7.6%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use dry chemical, foam or carbon dioxide to extinguish the fire. Water may be ineffective, but water should be used to keep fire-exposed containers cool. If a leak or spill has ignited, use water spray to disperse the vapors and to protect men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

NOTE: The inclusion of the phrase "water may be ineffective" is to indicate that although water can be used to cool and protect exposed material, water may not extinguish the fire unless used under favorable conditions by experienced fire fighters trained in fighting all types of flammable liquid fires.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)
High vapor concentrations (greater than approximately 1000 ppm) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.

Prolonged or repeated liquid contact with the skin will dry and defat the skin, leading to possible irritation and dermatitis.

NATURE OF HAZARD AND TOXICITY INFORMATION
Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

This product may contain up to a maximum of 4.9 weight percent benzene, CAS No. 71-43-2, as a natural constituent of various gasoline blend components. Benzene can cause anemia and other blood diseases, including leukemia (cancer of the blood-forming system), after prolonged or repeated exposures at high concentrations (e.g., 50-500 ppm). It has also caused fetal defects in tests on laboratory animals.

Contains light hydrocarbon components. Lifetime studies by the American Petroleum Institute have shown that kidney damage and kidney cancer can occur in male rats after prolonged inhalation exposures at elevated concentrations of total gasoline. Kidneys of mice and female rats were unaffected. The implication of these data for humans has not been determined, particularly since most human exposures are to light components, not to total gasoline. Certain components, such as normal hexane, may also affect the nervous system at high concentrations (e.g., 1000-1500 ppm). Typically, n-hexane represents 1 to 3% of gasoline. May contain a combined concentration of toluene, CAS No. 108-88-3, and xylene, CAS No. 1330-20-7, ranging from approximately 5 to 50%.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

Inhalation of components of exhaust from burning, such as carbon monoxide, may cause death at high concentrations. Exposure to the exhaust of this fuel should be minimized.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE
Benzene - Individuals with liver disease may be more susceptible to toxic effects.

Hexane - Individuals with neurological disease should avoid exposure.

Petroleum Solvents/Petroleum Hydrocarbons - Skin contact may aggravate an existing dermatitis.

OSHA REQUIRED LABEL INFORMATION

In compliance with hazard and right-to-know requirements, the following OSHA Hazard Warnings should be found on a label, bill of lading or invoice accompanying this shipment.

DANGER!

EXTREMELY FLAMMABLE

LONG-TERM, REPEATED EXPOSURE MAY CAUSE
CANCER, BLOOD, KIDNEY AND
NERVOUS SYSTEM DAMAGE

CONTAINS: BENZENE

Note: Product label will contain additional non-OSHA related information.

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal council should be consulted to insure proper health, safety and other necessary information is included on the container.

The Environmental Information included under Section H hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by Exxon Company, U.S.A. in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Exxon's interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 3157
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:
MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2355
HOUSTON, TX 77252-2180
(713) 656-5949

EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

DATE ISSUED: 08/31/89
SUPERSEDES DATE: 06/01/89

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
EXXON UNLEADED GASOLINE

PRODUCT CODE
025000 - 00290

CHEMICAL NAME
Motor Gasoline

CAS NUMBER
Complex Mixture
CAS Number not applicable

PRODUCT APPEARANCE AND ODOR
Clear colored liquid (typically yellow)
Gasoline hydrocarbon odor

MEDICAL EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION

Product is a variable complex mixture of components, principally hydrocarbons, blended to performance, rather than chemical, specifications and typically contains the following:

This product typically contains:

Naphtha, light cat	64741-55-5
Naphtha, heavy cat	64741-54-4
Naphtha, full range reformate	68919-37-9
Naphtha, full range alkalate	64741-64-6
Sweetened naphtha	64741-67-3
Butane	106-97-8
Proprietary Additives	Proprietary

See Section E for Health and Hazard Information.

See Section H for additional Environmental information.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	BASIS
1	4	0	Recommended by Exxon

EXPOSURE LIMIT FOR TOTAL PRODUCT	BASIS
100 ppm (300 mg/m3) for an 8-hour workday	Recommended by Exxon. The American Conference of Governmental Industrial Hygienists (ACGIH) lists Threshold Limit Value (TLV) of 300 ppm (900 mg/m3) for an 8-hour workday; 500 ppm STEL.
The airborne benzene level shall not exceed 1 ppm for an 8-hour workday or 5 ppm for any 15 minute period.	OSHA Regulation 29 CFR 1910.1028

C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
Approximately 21°C (70°F) IBP
to 227°C (440°F) FBP

SPECIFIC GRAVITY (15.6 C/15.6 C)
Approximately 0.74

MOLECULAR WEIGHT
Complex mixture, components vary from approximately 45 to 185

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT
Less than -38°C (-36 F)
Pour Point by ASTM D 97

VISCOSITY
Approximately 0.6 cSt @ 25°C

VAPOR PRESSURE
Varies seasonally from approximately 5 to 15 psi Reid Vapor Pressure

VAPOR DENSITY (AIR = 1)
Approximately 5

PERCENT VOLATILE BY VOLUME
100

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F)
(n-BUTYL ACETATE = 1)
Approximately 10-11

SOLUBILITY IN WATER @ 1 ATM. AND 25 C (77 F)
Negligible: less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

H. ENVIRONMENTAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Shut off and eliminate all ignition sources. Keep people away. Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize breathing vapors. Minimize skin contact. Ventilate confined spaces. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas.
Assure conformity with applicable governmental regulations. Continue to observe precautions for volatile, flammable vapors from absorbed material.

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL LAWS AND REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUTES:

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERCLA Section 102)
The RQ for:
Benzene is 1,000 pounds. This product may contain approximately 4.9% benzene.
Cumene is 5,000 pounds. This product may contain approximately 0.3% cumene.
Cyclohexane is 1,000 pounds. This product may contain approximately 0.5% cyclohexane.
Ethylbenzene is 1,000 pounds. This product may contain approximately 2.5% ethylbenzene.
Naphthalene is 100 pounds. This product may contain approximately 0.7% naphthalene.
Toluene is 1,000 pounds. This product may contain approximately 16% toluene.
Xylene is 1,000 pounds. This product may contain approximately 10% xylene.

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355 (SARA Sections 301-304)
No TPQ for product or any constituent greater than 1% or 0.1% (carcinogen).

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313)
This product may contain:
Approximately 4.9% benzene.
Approximately 0.3% cumene.
Approximately 0.5% cyclohexane.
Approximately 2.5% ethylbenzene.
Approximately 6.0% methyl-t-butyl ether.

Approximately 0.7% naphthalene.
Approximately 16% toluene.
Approximately 10% xylene.

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Sections 311-312)

EPA HAZARD CLASSIFICATION CODE:	Acute Hazard	Chronic Hazard	Fire Hazard	Pressure Hazard	Reactive Hazard	Not Applicable
	XXX	XXX	XXX			

I. PROTECTION AND PRECAUTIONS

VENTILATION
Use only with ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. No smoking, flame or other ignition sources.

RESPIRATORY PROTECTION
Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
Keep containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants. Adequate ventilation required sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Tanks that have been in leaded gasoline service may have lead-containing residue. Special precautions needed in cleaning. See American Petroleum Institute publications 2013, 2015 and 2015A. No smoking, flame or other ignition sources.

To minimize fire or explosion risk from static charge accumulation and discharge, effectively ground product transfer system in accordance with the National Fire Protection Association standard for petroleum products.

For use as a motor fuel only. Do not use as a cleaning solvent, or thinner, or for other non-motor fuel uses. Do not siphon by mouth. Minute amounts of liquid gasoline aspirated into the lungs may cause potentially fatal chemical pneumonitis.

In order to prevent fire or explosion hazards, use appropriate equipment.

Information on electrical equipment appropriate for use with this product may be found in the latest edition of the National Electrical Code (NFPA-70). This document is available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

PERSONAL HYGIENE
Minimize breathing vapor or mist. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before re-use. Remove contaminated shoes and thoroughly clean and dry before re-use. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION AND OSHA RELATED LABEL INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

DOT IDENTIFICATION NUMBER
Gasoline / Flammable Liquid / UN 1203

SKIN
In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water.

INHALATION
If overcome by vapor, remove from exposure and call a physician immediately. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION
If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

UNUSUAL FIRE AND EXPLOSION HAZARD

EXTREMELY FLAMMABLE VAPORS CAN TRAVEL AND EXPLODE

FLASH POINT (MINIMUM)
EXTREMELY FLAMMABLE - Per DOT 49 CFR 173.115
Approximately -38°C (-36°F)

AUTOIGNITION TEMPERATURE
Approximately 456°C (853°F)
National Fire Protection Association's Guide on Hazardous Materials

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity	BASIS
1	3	0	Recommended by the National Fire Protection Association

HANDLING PRECAUTIONS
This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

Keep product away from ignition sources, such as heat, sparks, pilot lights, static electricity, and open flames.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 1.4% Upper Flammable Limit 7.6%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use dry chemical, foam or carbon dioxide to extinguish the fire. Water may be ineffective, but water should be used to keep fire-exposed containers cool. If a leak or spill has ignited, use water spray to disperse the vapors and to protect men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

NOTE: The inclusion of the phrase "water may be ineffective" is to indicate that although water can be used to cool and protect exposed material, water may not extinguish the fire unless used under favorable conditions by experienced fire fighters trained in fighting all types of flammable liquid fires.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)
High vapor concentrations (greater than approximately 1000 ppm) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.

Prolonged or repeated liquid contact with the skin will dry and defat the skin, leading to possible irritation and dermatitis.

NATURE OF HAZARD AND TOXICITY INFORMATION
Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

This product may contain up to a maximum of 4.9 weight percent benzene, CAS No. 71-43-2, as a natural constituent of various gasoline blend components. Benzene can cause anemia and other blood diseases, including leukemia (cancer of the blood-forming system), after prolonged or repeated exposures at high concentrations (e.g., 50-500 ppm). It has also caused fetal defects in tests on laboratory animals.

Contains light hydrocarbon components. Lifetime studies by the American Petroleum Institute have shown that kidney damage and kidney cancer can occur in male rats after prolonged inhalation exposures at elevated concentrations of total gasoline. Kidneys of mice and female rats were unaffected. The implication of these data for humans has not been determined, particularly since most human exposures are to light components, not to total gasoline. Certain components, such as normal hexane, may also affect the nervous system at high concentrations (e.g., 1000-1500 ppm). Typically, n-hexane represents 1 to 3% of gasoline. May contain a combined concentration of toluene, CAS No. 108-88-3, and xylene, CAS No. 1330-20-7, ranging from approximately 5 to 50%.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

Inhalation of components of exhaust from burning, such as carbon monoxide, may cause death at high concentrations. Exposure to the exhaust of this fuel should be minimized.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE
Benzene - Individuals with liver disease may be more susceptible to toxic effects.

Hexane - Individuals with neurological disease should avoid exposure.

Petroleum Solvents/Petroleum Hydrocarbons - Skin contact may aggravate an existing dermatitis.

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
Approximately 21°C (70°F) IBP
to 227°C (440°F) FBP

SPECIFIC GRAVITY (15.6 C/15.6 C)
Approximately 0.74

MOLECULAR WEIGHT
Complex mixture, components vary from approximately 45 to 185

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT
Less than -38°C (-36 F)
Pour Point by ASTM D 97

VISCOSITY
Approximately 0.5 cSt @ 25°C

VAPOR PRESSURE
Varies seasonally from approximately 5 to 15 psi Reic Vapor Pressure

VAPOR DENSITY (AIR = 1)
Approximately 5

PERCENT VOLATILE BY VOLUME
100

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F)
(n-BUTYL ACETATE = 1)
Approximately 10-11

SOLUBILITY IN WATER @ 1 ATM. AND 25 C (77 F)
Negligible; less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

H. ENVIRONMENTAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Shut off and eliminate all ignition sources. Keep people away. Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize breathing vapors. Minimize skin contact. Ventilate confined spaces. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas.
Assure conformity with applicable governmental regulations. Continue to observe precautions for volatile, flammable vapors from absorbed material.

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL LAWS AND REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUTES:

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERCLA Section 102)
The RQ for:
Benzene is 1,000 pounds. This product may contain approximately 4.9% benzene.
Cumene is 5,000 pounds. This product may contain approximately 0.3% cumene.
Cyclohexane is 1,000 pounds. This product may contain approximately 0.5% cyclohexane.
Ethylbenzene is 1,000 pounds. This product may contain approximately 2.5% ethylbenzene.
Naphthalene is 100 pounds. This product may contain approximately 0.7% naphthalene.
Toluene is 1,000 pounds. This product may contain approximately 16% toluene.
Xylene is 1,000 pounds. This product may contain approximately 10% xylene.

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355 (SARA Sections 301-304)
No TPQ for product or any constituent greater than 1% or 0.1% (carcinogen).

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313)
This product may contain:
Approximately 4.9% benzene.
Approximately 0.3% cumene.
Approximately 0.5% cyclohexane.
Approximately 2.5% ethylbenzene.
Approximately 8.0% methyl-t-butyl ether.

Approximately 0.7% naphthalene.
Approximately 16% toluene.
Approximately 10% xylene.

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Sections 311-312)

EPA HAZARD CLASSIFICATION CODE:	Acute Hazard	Chronic Hazard	Fire Hazard	Pressure Hazard	Reactive Hazard	Not Applicable
	XXX	XXX	XXX			

I. PROTECTION AND PRECAUTIONS

VENTILATION
Use only with ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. No smoking, flame or other ignition sources.

RESPIRATORY PROTECTION
Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
Keep containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants. Adequate ventilation required sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Tanks that have been in leaded gasoline service may have lead-containing residue. Special precautions needed in cleaning. See American Petroleum Institute publications 2013, 2015 and 2015A. No smoking, flame or other ignition sources.

To minimize fire or explosion risk from static charge accumulation and discharge, effectively ground product transfer system in accordance with the National Fire Protection Association standard for petroleum products.

For use as a motor fuel only. Do not use as a cleaning solvent, or thinner, or for other non-motor fuel uses. Do not siphon by mouth. Minute amounts of liquid gasoline aspirated into the lungs may cause potentially fatal chemical pneumonitis.

In order to prevent fire or explosion hazards, use appropriate equipment.

Information on electrical equipment appropriate for use with this product may be found in the latest edition of the National Electrical Code (NFPA-70). This document is available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

PERSONAL HYGIENE
Minimize breathing vapor or mist. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before re-use. Remove contaminated shoes and thoroughly clean and dry before re-use. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION AND OSHA RELATED LABEL INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

DOT IDENTIFICATION NUMBER
Gasoline / Flammable Liquid / UN 1203

OSHA REQUIRED LABEL INFORMATION

In compliance with hazard and right-to-know requirements, the following OSHA Hazard Warnings should be found on a label, bill of lading or invoice accompanying this shipment.

DANGER!

EXTREMELY FLAMMABLE

LONG-TERM, REPEATED EXPOSURE MAY CAUSE
CANCER, BLOOD, KIDNEY AND
NERVOUS SYSTEM DAMAGE

CONTAINS: BENZENE

Note: Product label will contain additional non-OSHA related information.

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal council should be consulted to insure proper health, safety and other necessary information is included on the container.

The Environmental Information included under Section K hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by Exxon Company, U.S.A. in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Exxon's interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:

DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 3157
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:

MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2355
HOUSTON, TX 77252-2180
(713) 656-5949

EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

DATE ISSUED: 08/31/89
SUPERSEDES DATE: 06/01/89

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
EXXON LEADED GASOLINE

PRODUCT CODE
030000 - 00380

CHEMICAL NAME
Motor Gasoline

CAS NUMBER
Complex Mixture
CAS Number not applicable

PRODUCT APPEARANCE AND ODOR
Clear colored liquid (typically orange)
Gasoline hydrocarbon odor

MEDICAL EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION

Product is a variable complex mixture of components, principally hydrocarbons, blended to performance, rather than chemical, specifications and typically contains the following:

This product typically contains:

Naphtha, light cat	64741-55-5
Naphtha, heavy cat	64741-54-4
Naphtha, full range reformate	68919-37-9
Naphtha, full range alkalate	64741-64-6
Sweetened naphtha	64741-87-3
Butane	106-97-8
Proprietary Additives	Proprietary

See Section E for Health and Hazard Information.

See Section H for additional Environmental information.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	BASIS
1	4	0	Recommended by Exxon

EXPOSURE LIMIT FOR TOTAL PRODUCT
100 ppm (300 mg/m3) for an 8-hour workday

BASIS
Recommended by Exxon. The American Conference of Governmental Industrial Hygienists (ACGIH) lists Threshold Limit Value (TLV) of 300 ppm (900 mg/m3) for an 8-hour workday; 500 ppm STEL.

The airborne benzene level shall not exceed 1 ppm for an 8-hour workday or 5 ppm for any 15 minute period.

OSHA Regulation 29 CFR 1910.1028

C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN
In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water.

INHALATION
If overcome by vapor, remove from exposure and call a physician immediately. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION
If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

UNUSUAL FIRE AND EXPLOSION HAZARD

EXTREMELY FLAMMABLE VAPORS CAN TRAVEL AND EXPLODE

FLASH POINT (MINIMUM)
EXTREMELY FLAMMABLE - Per DOT 49 CFR 173.115
Approximately -38°C (-36°F)

AUTOIGNITION TEMPERATURE
Approximately 456°C (853°F)
National Fire Protection Association's Guide on Hazardous Materials

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity	BASIS
1	3	0	Recommended by the National Fire Protection Association

HANDLING PRECAUTIONS
This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

Keep product away from ignition sources, such as heat, sparks, pilot lights, static electricity, and open flames.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 1.4% Upper Flammable Limit 7.6%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use dry chemical, foam or carbon dioxide to extinguish the fire. Water may be ineffective, but water should be used to keep fire-exposed containers cool. If a leak or spill has ignited, use water spray to disperse the vapors and to protect men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

NOTE: The inclusion of the phrase "water may be ineffective" is to indicate that although water can be used to cool and protect exposed material, water may not extinguish the fire unless used under favorable conditions by experienced fire fighters trained in fighting all types of flammable liquid fires.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)
High vapor concentrations (greater than approximately 1000 ppm) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.

Prolonged or repeated liquid contact with the skin will dry and defat the skin, leading to possible irritation and dermatitis.

NATURE OF HAZARD AND TOXICITY INFORMATION
Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

This product may contain up to a maximum of 4.9 weight percent benzene, CAS No. 71-43-2, as a natural constituent of various gasoline blend components. Benzene can cause anemia and other blood diseases, including leukemia (cancer of the blood-forming system), after repeated or prolonged exposures at high concentrations (e.g., 50-500 ppm). It has also caused fetal defects in tests on laboratory animals.

Contains light hydrocarbon components. Lifetime studies by the American Petroleum Institute have shown that kidney damage and kidney cancer can occur in male rats after prolonged inhalation exposures at elevated concentrations of total gasoline. Kidneys of mice and female rats were unaffected. The implication of these data for humans has not been determined, particularly since most human exposures are to light components, not to total gasoline. Certain components, such as normal hexane, may also affect the nervous system at high concentrations (1000 to 1500 ppm). Typically, n-hexane represents 1 to 3% of gasoline. May contain a combined concentration of toluene, CAS No. 108-88-3, and xylene, CAS No. 1330-20-7, ranging from approximately 5 to 50%.

Contains organic lead alkyl additives up to a max. of 4.2 gm lead/gallon or approximately 0.15% lead additives.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

Inhalation of components of exhaust from burning, such as carbon monoxide, may cause death at high concentrations. Exposure to the exhaust of this fuel should be minimized.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE
Benzene - Individuals with liver disease may be more susceptible to toxic effects.

Hexane - Individuals with neurological disease should avoid exposure.

Petroleum Solvents/Petroleum Hydrocarbons - Skin contact may aggravate an existing dermatitis.

Lead - To avoid further damage, those with kidney, neurological or blood disease should avoid

exposure. Exposure during pregnancy should be avoided. Exposure may aggravate or precipitate an attack of gout.

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
Approximately 21°C (70°F) IBP
to 227°C (440°F) FBP

SPECIFIC GRAVITY (15.6 C/15.6 C)
Approximately 0.74

MOLECULAR WEIGHT
Complex mixture, components vary from approximately 45 to 185

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT
Less than -38°C (-36 F)
Pour Point by ASTM D 97

VISCOSITY
Approximately 0.5 cSt @ 25°C

VAPOR PRESSURE
Varies seasonally from approximately 5 to 15 psi Reid Vapor Pressure

VAPOR DENSITY (AIR = 1)
Approximately 5

PERCENT VOLATILE BY VOLUME
100

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F)
(n-BUTYL ACETATE = 1)
Approximately 10-11

SOLUBILITY IN WATER @ 1 ATM. AND 25 C (77 F)
Negligible; less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

H. ENVIRONMENTAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Shut off and eliminate all ignition sources. Keep people away. Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize breathing vapors. Minimize skin contact. Ventilate confined spaces. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas.
Assure conformity with applicable governmental regulations. Continue to observe precautions for volatile, flammable vapors from absorbed material.

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL LAWS AND REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUTES:

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERCLA Section 102)
The RQ for:
Benzene is 1,000 pounds. This product may contain approximately 4.9% benzene.
Cumene is 5,000 pounds. This product may contain approximately 0.3% cumene.
Cyclohexane is 1,000 pounds. This product may contain approximately 0.5% cyclohexane.
Ethylbenzene is 1,000 pounds. This product may contain approximately 2.5% ethylbenzene.
Naphthalene is 100 pounds. This product may contain approximately 0.7% naphthalene.
Toluene is 1,000 pounds. This product may contain approximately 16% toluene.
Xylene is 1,000 pounds. This product may contain approximately 10% xylene.

The RQ for lead compounds is 1 pound. This product contains approximately 0.15% lead compounds.

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355 (SARA Sections 301-304)
No TPQ for product or any constituent greater than 1% or 0.1% (carcinogen).

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313)
This product may contain:
- Approximately 4.9% benzene.
- Approximately 0.3% cumene.
- Approximately 0.5% cyclohexane.
- Approximately 2.5% ethylbenzene.
- Approximately 6.0% methyl-t-butyl ether.
- Approximately 0.7% naphthalene.
- Approximately 16% toluene.
- Approximately 10% xylene.

This product contains approximately 0.15% lead compounds.

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Sections 311-312)

EPA HAZARD CLASSIFICATION CODE:	Acute Hazard	Chronic Hazard	Fire Hazard	Pressure Hazard	Reactive Hazard	Not Applicable
	XXX	XXX	XXX			

I. PROTECTION AND PRECAUTIONS

VENTILATION
Use only with ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. No smoking, flame or other ignition sources.

RESPIRATORY PROTECTION
Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
Keep containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants. Adequate ventilation required sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Tanks that have been in leaded gasoline service may have lead-containing residue. Special precautions needed in cleaning. See American Petroleum Institute publications 2013, 2015 and 2015A. No smoking, flame or other ignition sources.

To minimize fire or explosion risk from static charge accumulation and discharge, effectively ground product transfer system in accordance with the National Fire Protection Association standard for petroleum products.

For use as a motor fuel only. Do not use as a cleaning solvent, or thinner, or for other non-motor fuel uses. Do not siphon by mouth. Minute amounts of liquid gasoline aspirated into the lungs may cause potentially fatal chemical pneumonitis.

In order to prevent fire or explosion hazards, use appropriate equipment.

Information on electrical equipment appropriate for use with this product may be found in the latest edition of the National Electrical Code (NFPA-70). This document is available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

PERSONAL HYGIENE
Minimize breathing vapor or mist. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before re-use. Remove contaminated shoes and thoroughly clean and dry before re-use. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION AND OSHA RELATED LABEL INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

DOT IDENTIFICATION NUMBER
Gasoline / Flammable Liquid / UN 1203

OSHA REQUIRED LABEL INFORMATION
In compliance with hazard and right-to-know requirements, the following OSHA Hazard Warnings should be found on a label, bill of lading or invoice accompanying this shipment.

DANGER!

EXTREMELY FLAMMABLE

LONG-TERM, REPEATED EXPOSURE MAY CAUSE
CANCER, BLOOD, KIDNEY AND
NERVOUS SYSTEM DAMAGE

CONTAINS: BENZENE

Note: Product label will contain additional non-OSHA related information.

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal council should be consulted to insure proper health, safety and other necessary information is included on the container.

The Environmental Information included under Section H hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by Exxon Company, U.S.A. in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Exxon's interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 3157
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:
MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2355
HOUSTON, TX 77252-2180
(713) 656-5949