FINAL
PHASE 1 REMEDIAL INVESTIGATION
PROJECT WORK PLAN
MONTEREY APARTMENTS
SEATTLE, WASHINGTON

Contract No. C0089007

Document Control Number WB6120.1.1

May 15, 1991

Prepared By:

ECOLOGY AND ENVIRONMENT, INC.
101 Yesler Way
Suite 600
Seattle, Washington 98104

Prepared For:

WASHINGTON STATE DEPARTMENT OF ECOLOGY
Toxics Cleanup Program

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Approved By:

Brain Sato	5-30-91	John L. Roland	5-21-91
Ecology Project Officer	Date	E & E Project Manager	Date

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MONTEREY APARTMENTS
SEATTLE, WASHINGTON

DOCUMENT DISTRIBUTION LIST

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Brian Sato	Project Officer	Ecology, Bellevue	05-15-91
John L. Roland	Project Manager	E & E, Seattle	05-15-91

PHASE 1 REMEDIAL INVESTIGATION
PROJECT WORK PLAN
MONTEREY APARTMENTS
SEATTLE, WASHINGTON

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FOR
PHASE 1
REMEDIAL INVESTIGATION
MONTEREY APARTMENTS

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MONTEREY APARTMENTS - PHASE 1
REMEDIAL INVESTIGATION
SITE SAFETY PLAN
(for use by E & E personnel only)

A. GENERAL INFORMATION

Project Name: Monterey Apartments Phase 1 Remedial Investigation

Project No.: WB6120
Work Assignment No. 1

Project Manager: John L. Roland - E & E, Seattle

Site Location: 622 First Avenue West, Seattle, Washington 98119

Prepared by: John L. Roland - E & E, Seattle

Date Prepared: March 4, 1991

Approval by: _____ Date Approved: 3/4/91

Site Safety Officer Review: _____ Date Reviewed: 3/5/91

Team Member	Responsibility
John L. Roland	Team Leader
Lisa Burley	Site Safety Coordinator
David Anderson	Hydrogeologist
David Field	Technician
Mike LaBarge	Technician

Proposed Dates of Field Activities:
March 4 through March 30, 1991

Introduction:
The field work to be conducted under this Site Safety Plan will be performed by Ecology and Environment, Inc. (E & E) for the Washington State Department of Ecology (Ecology) under the framework of the State Model Toxic Control Act cleanup requirements as defined by WAC 173-340.

Special Regulatory Considerations:
Worker safety and health provisions will conform to applicable Washington State requirements (WAC 173-340-810). All E & E field staff participate in a medical monitoring program and have completed applicable training as per WAC 296-62. Also, E & E's respiratory protection program meets the requirements of WAC 296-62.

Scope/Objective of Work:
This Phase 1 remedial investigation (RI) will involve: the installation of soil-gas detection probes to define the subsurface distribution of volatile organic contamination caused by refined petroleum product (gasoline) leaking from underground storage tank(s) (USTs); aquifer testing; monitoring well groundwater sampling; terrain conductivity surveying; sewer line/storm drain mapping; and UST tightness testing.

All field work will be performed in accordance with the project-specific Phase 1 RI Sampling and Analysis Plan and Quality Assurance Project Plan. Further details on sampling, procedural, and analytical aspects of the effort can be found in these associated documents.

The scope of this project will not include **confined space entries**. If such a condition develops, the team members will halt operations and evacuate immediately. At that time, the E & E regional safety officer will be contacted and appropriate modifications to the plan will be made and approved.

Background Information:
The Monterey Apartments site is a multi-unit apartment building located in the mixed residential/commercial Queen Anne district of the City of Seattle. The building has a lower, subgrade level containing several apartment units which, since at least 1986, have been impacted by uncontrolled organic vapors originating from free gasoline product which has contaminated, and traveled along, the shallow perched water table directly beneath the building foundation. The spilled fuel is thought to have originated from one or more service station USTs located (or previously located) on properties at the intersection of Queen Anne Avenue North and West Roy Street in Seattle. The service stations are the Manhattan Express Texaco, and the Unocal Counterbalance station.

Recent monitoring well inspections and the performance of a pilot soil-gas survey have confirmed the persistence of a floating petroleum layer on the water table, and the presence of detectable volatile aromatic petroleum organic vapors in the soil vadose zone.

Chemical Hazard Summary:

Gasoline components consisting of hydrocarbons in the C-4 to C-12 range, benzene, ethyl benzene, toluene, xylenes, ethylene dibromide, and lead. Chemical hazards of primary concern are the inhalation of volatile vapors, dermal contact, and ocular exposure.

Physical Hazards Summary:

Trip/fall, pinch-point, abrade, cut, puncture, back strain, hydraulic driving of steel probes resulting in flying debris, damage to utilities (i.e., gas, water, and electric), automobile traffic, and noise.

Overall Chemical Hazard: Low

Overall Physical Hazard: Moderate

B. SITE/WASTE CHARACTERISTICS

Waste Type(s):
Organic liquids and vapors

Chemical Hazards:
Carcinogenic, flammable, and volatile

Physical Hazards:
Percussion instrument hazards using the Geoprobe soil-gas sampling equipment: cut, pinch-point, abrade, trip/fall, puncture, noise; Location specific site hazards include: high traffic volume, aboveground and underground utilities (water, gas, and electric), and potential heat/cold stress

Site History/Description and Unusual Features:
See **GENERAL INFORMATION** section above, and refer to project Sampling and Analysis Plan and Quality Assurance Project Plan for further discussion.

Site activities will be occurring at two active gasoline service stations and along the sidewalks of residential/commercial properties within a two-block radius of the service stations. Soil-gas installation points along the streets will, at times, cause minor, temporary disruption of motor vehicle or pedestrian traffic.

Spilled floating petroleum product is known to exist atop the water table beneath the Manhattan Express Service station.

Locations of Chemicals/Wastes:
Groundwater and soil petroleum contamination underlie the service stations, as well as the immediate vicinity. Floating petroleum product (gasoline/diesel mixture having less than 5 ppm lead) has been observed in monitoring well MW-6 at thicknesses of 8 to 10 inches, as recently as February 1991.

Estimated Volume of Chemicals/Wastes:
Greater than 500 gallons.

Site Currently in Operation:
Monterey Apartments currently has tenants and the nearby gas stations (Manhattan Express Texaco, and Unocal) are active businesses.

C. HAZARD EVALUATION

List of Field Tasks:

Task 1: Aquifer testing (bail-down test)

Task 2: Groundwater monitoring well sampling

Task 3: Soil-gas survey and groundwater sampling

Task 4: Terrain conductivity surveying

Task 5: Sewer line/storm drain locating

Task 6: UST tightness testing

Physical Hazard Evaluation:

Note: All tasks potentially involve work in the vicinity of automobile traffic.

Task 1: Splash, pinch-points, back strain, trip, cut, noise.

Task 2: Splash, pinch-points, back strain, trip, cut, noise.

Task 3: Percussion hazards: pinch-points, trip/fall, cut, noise, puncture, contact with utilities (electric water, gas), flying debris.

Task 4: Trip/fall, noise.

Task 5: E & E personnel will oversee this task which will be conducted by a subcontractor. Trip/fall and noise.

Task 6: E & E personnel will oversee this task which will be conducted by a subcontractor. Trip/fall and noise.

Summary of Chemical Hazard Evaluation:*

Compound	PEL/TWA	Route of Exposure	Acute Symptoms	Odor Threshold	Odor Description
Benzene	1.0 ppm	inhale/dermal	dizzy/headache	5 ppm	aromatic
Toluene	100 ppm	inhale/dermal	resp. irritant	1.2 ppm	pungent
Ethyl benzene	100 ppm	inhale/dermal	resp. irritant	0.1 ppm	oily
Xylene (meta, ortho, para)	100 ppm	inhale/dermal	dizzy/headache	20 ppm	aromatic
Ethylene dibromide	200 ppm	inhale/dermal	resp. irritant	10 ppm	sweet
Lead	0.006 ppm	inhale/dermal		none	none

* Note: A Hazard Evaluation Sheet for each major known contaminant is attached (see Attachments).

D. SITE SAFETY WORK PLAN

Site Control:

Perimeter identified: Yes, multiple work areas

Site secured: No

Work Areas Designated: Monterey Apartments parking lot, and Express parking lot (SW corner).

Zone(s) of Contamination Identified: Yes

Personnel Protection (TLD badges required for all field personnel):

Anticipated Level of Protection (cross-reference task numbers to Section C):

	Level of Protection*			
	A	B	C	D
Task 1			x	
Task 2			x	x
Task 3				x
Task 4				x
Task 5				x
Task 6				x

* Modifications: Monitoring well sampling (Task 2) will be conducted in modified level D (Saranex suits, surgical and viton gloves, and Neoprene or disposable booties) unless Level C respiratory upgrade is required because breathing zone permissible exposure limits are exceeded. Additional personnel available for traffic control if deemed necessary by project manager. Police/security also available.

Ambient air monitoring with photoionization detector (PID) will be conducted during the installation of each soil-gas probe, and also systematically during the well sampling.

Action Levels for Work Zone:

Organic Vapors: >1ppm above background in breathing zone - use Level C
>5ppm above background in breathing zone - use Level B

Oxygen: <19.5% - use Level B
>25% - exit site

Combustible Gases: >10% LEL - continuous monitoring
>25% LEL - exit site

Dust: >5 mg/m3 - use Level C

Radiation: >0.1mR/hr - continuous monitoring
>2mR/hr - exit site and conduct stay-time calculations

Air Monitoring (daily calibration unless otherwise noted):

Contaminant of Interest	Type of Sample (area, personal)	Monitoring Equipment	Frequency of Sampling
Benzene	personal	PID	periodic (1)
Ethyl benzene	personal	PID	periodic (1)
Toluene	personal	PID	periodic (1)
Xylene	personal	PID	periodic (1)

(1) Air monitoring will be conducted during each soil-gas probe installation and during aquifer well sampling

Decontamination Solutions and Procedures for Equipment, Sampling Gear, etc.:
Where possible, disposable sampling equipment will be used. When necessary, the decontamination procedure will include a consecutive series of the following washes: Alconox detergent solution-> tapwater-> carbon-free water

Personnel Decontamination Protocol:
Decontamination station(s) will be set up in the designated work areas on visqueen plastic tarps in order to control any spills of decontamination solutions. All employees will wash face and hands before eating or smoking, and at the end of each working day. Personnel will shower at the end of each workday.

Decontamination Solution Monitoring Procedures: N/A

Special Site Equipment, Facilities, or Procedures:
Traffic control personnel and police/security available if deemed necessary by project manager.

Soil-gas sampling equipment is a truck-mounted percussion rod driving device and will be operated with appropriate caution.

Site Entry Procedures and Special Considerations:
Site is unsecured and open to pedestrian and automotive traffic. Each work zone will be marked clearly by cones, warning tape, or barricades to secure the area. Procedures will progress in an orderly manner so as to minimize risks to the general public.

Work Limitations:
Traffic control will be implemented within parking lot, street side, and gas station areas.

Workers will take adequate breaks to minimize heat stress.

General Spill Control:
All decontamination will be performed atop visqueen plastic to control any solution spills.

See Emergency Contingency Plans in Section E.

Investigation-Derived Material Disposal:
All disposable equipment will be double plastic bagged and disposed of at a sanitary landfill.

Sample Handling Procedures Including Protective Wear:
Task 2 - Level D, except for possible handling of well water samples when procedures outlined under Personnel Protection (Section C) will be followed.

E. EMERGENCY INFORMATION

LOCAL RESOURCES

Ambulance: 911

Hospital Emergency Room: 583-6433 Virginia Mason Clinic

Police: 911

Fire Department: 911

Poison Control Center: 911

Agency Contacts: David South , Ecology 867-7200
Brian Sato, Ecology 867-7265

Site Contact: N/A

EMERGENCY CONTINGENCY PLANS

Utility Damage:

All soil-gas probe installation stations will be cleared through the Underground Location Center at 1-800-424-5555, or City Utilities Department - contact Engineering Utilities at 684-5270. If a utility is struck, all drilling will cease until the appropriate utility personnel have assessed the situation.

UST or Piping Spill or Rupture:

If petroleum storage tanks or pipes are damaged while performing the soil-gas survey (Task 3) or tank tests (Task 6) on the Manhattan Express service station property the operators will immediately notify the station representative and the system will be shut down. If appropriate, the fire department will be contacted, as will the Ecology emergency response on-call duty officer for the Northwest Regional Office.

Fire Department: 911
Ecology: 885-1900

SITE RESOURCES

Site Emergency Evacuation Alarm Method: Sound vehicle horn, series of 8 rapid short blasts!

Water Supply Source: Monterey Apartments property - outside tap

Telephone Location, Number: Monterey Apartments - Building manager, Carol Curtis, room 101

Cellular Phone Number: N/A

Radio: N/A

E & E EMERGENCY CONTACTS

1.	E & E Emergency Response Center 24-hour Hot Line	(716) 684-8940
	Ecology and Environment, Inc., Corporate Safety Director Paul Jonmaire	(716) 684-8060 (office) (716) 655-1260 (home)
2.	MEDTOX (Dr. Raymond Harbison)	(501) 221-0465 or (904) 462-3277, 3281 (501) 370-8263 (24 hours)
3.	Jon Bagby (Regional Safety Coordinator)	(206) 782-9511 (home) (206) 624-9537 (office)
4.	Regional Manager, David Buecker	(206) 747-9264 (home)
	FITOM, Andrew Hafferty	(206) 854-6901 (home)
	TATL, William Carberry	(206) 842-2540 (home)
	Program Director, Peter Jowise.....	(206) 365-6094 (home)

MEDTOX HOTLINE

1. 24-hour answering service: (501) 370-8263

   What to report:

   State: "This is an emergency!"

   Your name, region, and site.

   Telephone number to reach you.

   Your location.

   Name of person injured or exposed.

   Nature of emergency.

   Action taken.

2. A toxicologist, (Dr. Raymond Harbison or associate) will contact you. Repeat the information given to the answering service.

3. If a toxicologist does not return your call within 15 minutes, call the following persons in order until contact is made:

   a. **24 hour hotline - (716) 684-8940**
   b. Corporate Safety Director - Paul Jonmaire - home # (716) 655-1260
   c. Assistant Corp. Safety Officer - Steven Sherman - home # (716) 688-0084

EMERGENCY ROUTES

(NOTE: Field team must know route(s) prior to start of work)

Directions to Hospital (see attached map): Virginia Mason Clinic, 927 Seneca Street.
Drive south on Queen Anne Avenue to Denny Way. Turn left (east) onto Denny Way. Continue to Boren Street. Turn right onto Boren Street. Continue to Spring Street. Turn right onto Spring Street. Emergency Room entrance is at the corner of Spring and 9th Avenue.

Emergency Egress Routes to Exit Site:
Unsecured site. Each sampling station will be assessed to determine appropriate egress routes.

F. PERSONNEL PROTECTIVE GEAR

Level C:

Ultra-Twin APR	X
Powered APR	
Back Mount APR	
Cartridges (Type: GMC-H)	X
Five Min. Escape Mask	
Protective Coveralls (Type: Saranex)	X
Surgical Gloves	X
Protective Outer Gloves (Type: Viton and Nitrile)	X
Neoprene Safety Boots	X
Protective Booties	
Hard Hat with Face Shield	
Radiation Dosimeter Badge	X
Rain Suit	
Butyl Apron	

Level D:

Ultra-Twin APR (Available)	X
Cartridges (Type: GMC-H)	X
Five Min. Escape Mask	
Work Coveralls	X
Surgical Gloves	
Protective Outer Gloves (Type: Viton and Nitrile)	X
Neoprene Safety Boots	
Protective Booties	
Hard Hat with Face Shield	
Radiation Dosimeter Badge	
Rain Suit	X
Steel-toe Boots	X
Safety Glasses	X

G. SAFETY MEETING LOG SHEET

Site Name: Monterey Apartments Phase 1 RI

Date: Time: E & E Project No.: WB6000

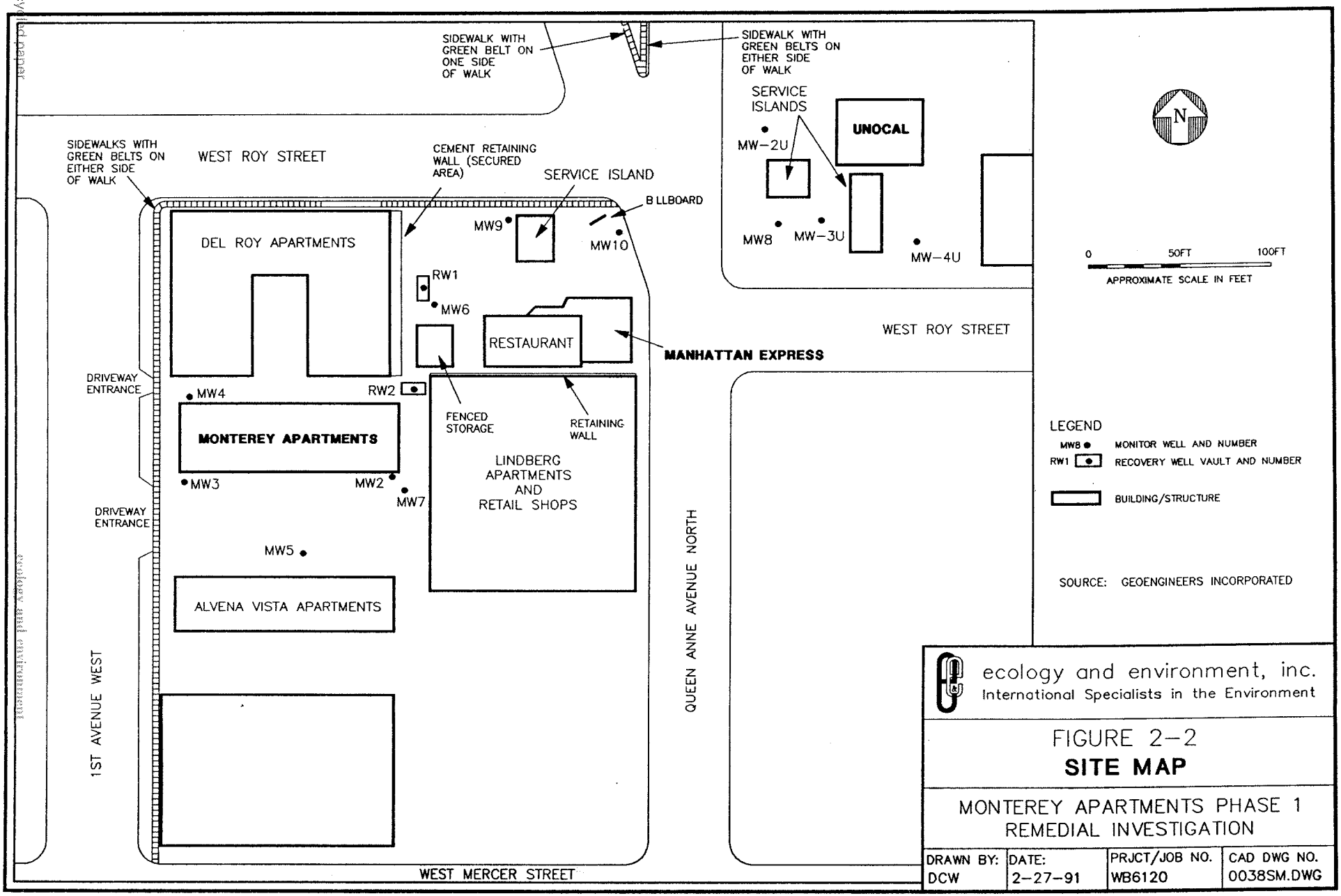
NAME (Printed)	Signature/Date

Meeting Conducted By:

Safety Officer:

Team Leader:

ATTACHMENTS

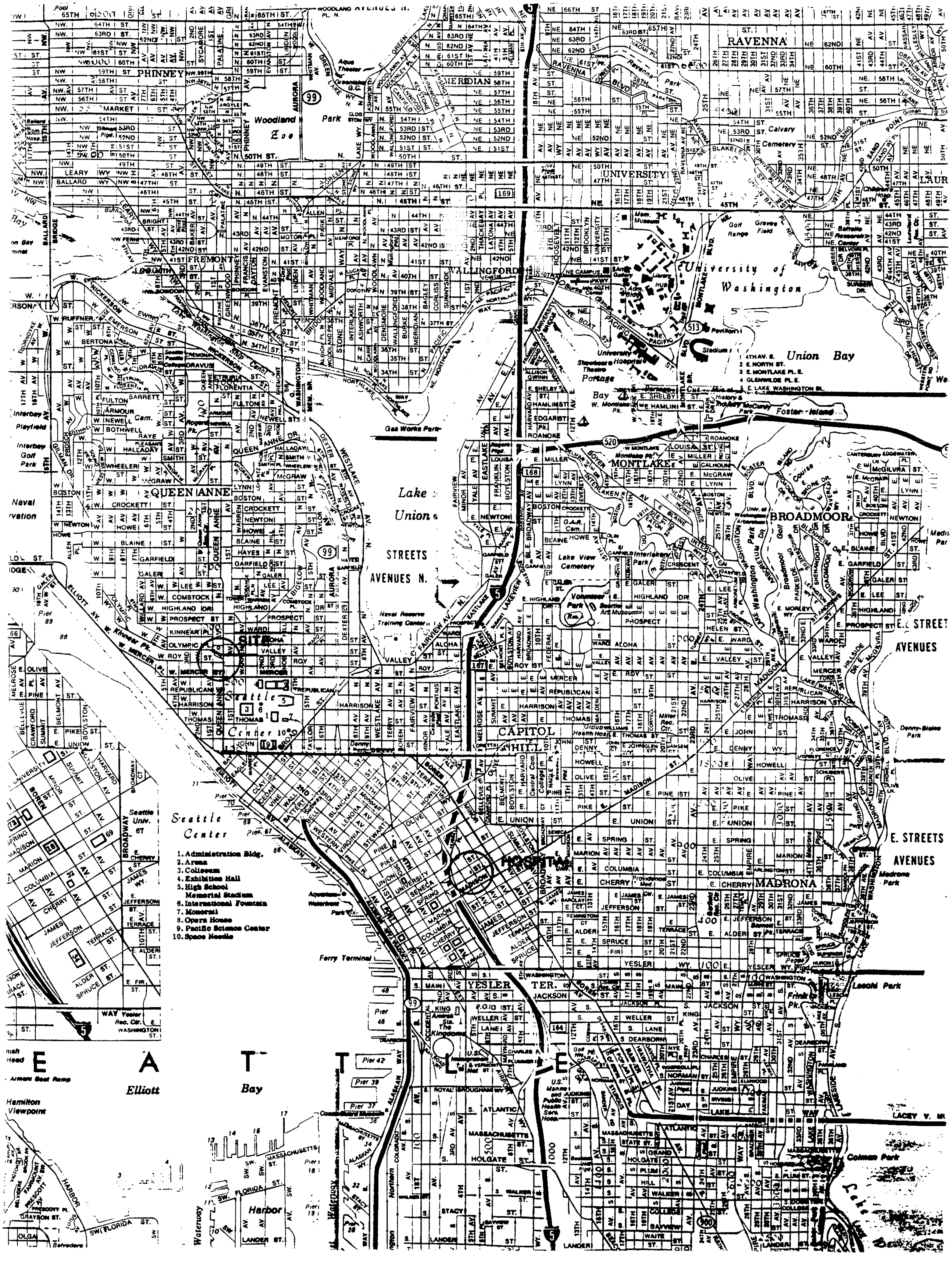


ecology and environment, inc.
International Specialists in the Environment

FIGURE 2-2
SITE MAP

MONTEREY APARTMENTS PHASE 1
REMEDIAL INVESTIGATION

DRAWN BY:	DATE:	PRJCT/JOB NO.	CAD DWG NO.
DCW	2-27-91	WB6120	0038SM.DWG



PHINNEY
Woodland Park Zoo
AURORA
MERIDIAN
RAVENNA
Ravenna Park
Calvary Cemetery
UNIVERSITY
University of Washington
Union Bay
1. 4TH AV. E.
2. E. NORTH ST.
3. E. MONTLAKE PL. E.
4. GLENWILDE PL. E.
5. E. LAKE WASHINGTON BL.
Foster Island
FREMONT
WALLINGFORD
Gas Works Park
Portage Bay
MONTLAKE
Lake Union
STREETS
AVENUES N.
QUEEN ANNE
BROADMOOR
Lake View Cemetery
Volunteer Park
Interlaken Park
E. STREETS
AVENUES
SITE
Seattle Center
CAPITOL HILL
HOSPITAL
MADRONA
Madrona Park
Denny-Blaine Park
Leschi Park
Colman Park
YESLER TER.
Ferry Terminal
Naval Reserve Training Center
Seattle Center
1. Administration Bldg.
2. Arena
3. Coliseum
4. Exhibition Hall
5. High School Memorial Stadium
6. International Fountain
7. Monorail
8. Opera House
9. Pacific Science Center
10. Space Needle
Seattle Univ.
E A T T L E
Elliott Bay
Hamilton Viewpoint
Harbor
Waterway
The Kingdome
LACEY V. MURROW

Ecology and Environment, Inc.
Hazard Evaluation of Chemicals
Region V - Chicago

DATE : / /
JOB NO: _____

CHEMICAL NAME: Benzene

SYN : Benzol, Benzole, Benzolene, Coal Tar Naphtha
CAS NO: 71-43-2 FORMULA: C6H6
DOT CLASS: 1114

CHEMICAL PROPERTIES

Phys St: Liquid	Boil Pt: 176.00°F	Ionz Pot : 9.25ev	Fl Pt: 12.00°F
Mol Wt : 78.11	Melt Pt: 41.00°F	Vap Press: 75.00000mmHg	LFL : 1.30%
Sp Gr : 0.88	Frz Pt : 42.00°F	Odr Thr : 5.00ppm	UFL : 7.90%

Odor : aromatic, pleasant, sweet
INCOMPAT/REACT: nitric acid, oxidizing agents, chlorine, bromine
SOLUBILITY : Water-slightly, soluble in organic solvents

TOXICOLOGICAL PROPERTIES

Exposure Limits: TLV-TWA (ACGIH): 0.1 ppm (A1) PEL (OSHA): 1.0 ppm
STEL: 5.0 ppm IDLH: 2000.00000ppm

OTHER PROPERTIES : CEILING: 25PPM/15MIN. ACCEPT MAX PEAK ABOVE CEIL
Tox Data: INHAL : rat LC50: 10000ppm/7hr
DERMAL : skin rbt: 500mg/24H MODERAT
ORAL : rat LD50: 4894mg/kg
CARCIN : human positive
MUTAGEN : exper
REPRO TOX: exper
AQUATIC : 5ppm/6hr/minnow/lethal/distilled water
OTHER TOX: TARGET ORGANS: Blood, CNS, Skin, Bone Marrow, Eyes, Resp Sys
ROUTES OF EXP: Ingestion, Eye(Ocular), Dermal Absorption, Skin Contact, Inhalation

PERSONAL PROTECTIVE MEASURES

RESPIRATORS : APR: dusty/windy condit or known high concent or >1 but <5ppm; SCBA: >5ppm
CARTRIDGE TYPE : GMC-II or APR (ORGAL)
PROTECTIVE CLOTHING: Coverall: Saranex Gloves: Silvershield Str, PVA-Glr, Vitron-Glr (PVA degrade in water)
SPEC PRECAUTIONS : OSHA REGULATED CARCINOGEN.

FIRST AID

INHALATION: move to fresh air,-give O2/CPR if nec, SEEK MEDICAL ATTENTION
EYE/SKIN : remove contaminated clothes, flush areas w/water for 15 min, SEEK MEDICAL ATTENTION
INGESTION : Treat for shock, CPR if nec., SEEK MEDICAL ATTENTION

SYMPTOMS

ACUTE : dizziness,weakness,euphoria,headache,nau/vomt,tight chest,staggering, visual blurring,tremors,skin irritation/scaling/cracking
CHRONIC: loss of appetite, drowsy, nervous, pallor, anemia, petechiae, abnml bleeding, aplasia of bone marrow, leukemia, encephalopathy w/ataxia, tremulousness, emotional lability, diffuse cerebral atrophy

DISPOSAL, FIRE, SPILLS (see attached sheet)

DISPOSAL: D FIRE: 6,7 LEAKS & SPILLS: 3,4,5,6,9
DECOMPOSITION PRODUCTS: carbon monoxide, carbon dioxide

REFERENCES CONSULTED

NIOSH/OSHA Pocket Guide, Chris(vol. III), ACGIH TLV Booklet, RTECS
OTHER REFERENCES: Sigma-Aldrich, Handbook of Poisoning, OSHA

CHEMICAL CLASSIFICATION: Aromatic Hydrocarbon

LAST REVISION DATE:
2/18/91

Ecology and Environment, Inc.
Hazard Evaluation of Chemicals
Region V - Chicago

DATE : / /
JOB NO: _____

CHEMICAL NAME: Toluene

SYN : Toluol, Methylbenzene
CAS NO: 108-88-3 FORMULA: C6H5CH3
DOT CLASS: 1294/FLAM LIQ 3

CHEMICAL PROPERTIES

Phys St: Liquid | Boil Pt: 231.10°F | Ionz Pot : 8.8 eV | Fl Pt: 40.00°F
Mol Wt : 92.14 | Melt Pt: -139.00°F | Vap Press: 22.00 mmHg | LFL : 1.27%
Sp Gr : 0.87 | Frz Pt : -139.00°F | Odr Thr : 1.20ppm | UFL : 7.00%
Odor : pungent, aromatic, benzene-like, sour
INCOMPAT/REACT: nitric acid, strong oxidizers, peroxides
SOLUBILITY : water-slightly

TOXICOLOGICAL PROPERTIES

Exposure Limits: TLV-TWA (ACGIH): 100 ppm PEL (OSHA): 100.00 ppm
STEL: 150.00 ppm IDLH: 2000.00 ppm
OTHER PROPERTIES : CEILING: 300ppm, MAX PEAK: 500ppm/10M/8H shift, IRRITANT
Tox Data: INHAL : human Tclo: 200ppm
DERMAL : skn rbt: LD50 12124 mg/kg
ORAL : rat: LD50 5000mg/kg
CARCIN : exper
MUTAGEN : exper
REPRO TOX: exper teratogen
AQUATIC : 1180mg/l/96hr/sunfish/TLm/fresh water
OTHER TOX: TARGET ORGANS: CNS, Liver, Skin, Kidney
ROUTES OF EXP: Ingestion, Eye(Ocular), Skin Contact, Inhalation

PERSONAL PROTECTIVE MEASURES

RESPIRATORS : AFR: dusty/windy condit or known high concent or >1 but <5ppm; SCBA: >5ppm
CARTRIDGE TYPE : GMC-H
PROTECTIVE CLOTHING: Coverall: Saranex Gloves: Viton
SPEC PRECAUTIONS :

FIRST AID

INHALATION: move to fresh air, artf resp if nec, SEEK MEDICAL ATTENTION
EYE/SKIN : flush w/water 15 minutes, SEEK MEDICAL ATTENTION
INGESTION : DO NOT INDUCE VOMITING, SEEK MEDICAL ATTENTION IMMEDIATELY

SYMPTOMS

ACUTE : eye/respiratory/skin irritation, fatigue, weakness, confusion, headachedizziness, drowsiness, tingling skin, numbness, vision disturbances, mild macrocytic anemia, narcotic in high concentrations,coma
CHRONIC: drying & cracking of skin, fatty degeneration of the heart, liver, and adrenals, and hemorrhages, anemia

DISPOSAL, FIRE, SPILLS (see attached sheet)

DISPOSAL: D FIRE: 6,7 LEAKS & SPILLS: 3,4,5,6,9
DECOMPOSITION PRODUCTS: CO2, CO

REFERENCES CONSULTED

NIOSH/OSHA Pocket Guide, Chris(vol. III), ACGIH TLV Booklet, RTECS
OTHER REFERENCES: NIOSH Guides, Sigma-Aldrich

CHEMICAL CLASSIFICATION: Aromatic Hydrocarbon

LAST REVISION DATE:
2/18/91

Ecology and Environment, Inc.
Hazard Evaluation of Chemicals
Region V - Chicago

DATE : / /
JOB NO: _____

CHEMICAL NAME: Ethyl Benzene

SYN : Phenylethane, Ethylbenzol
CAS NO: 100-41-4 FORMULA: $C_6H_5CH_2CH_3$
DOT CLASS: 1175-FL LIQ CLS

CHEMICAL PROPERTIES

Phys St: Liquid	Boil Pt: 277.20°F	Ionz Pot : 8.76ev	Fl Pt: 59.00°F
Mol Wt : 106.17	Melt Pt: -139.00°F	Vap Press: 7.10 mmHg	LFL : 1.00%
Sp Gr : 0.86	Frz Pt : -139.00°F	Odr Thr : .092-0.60 ppm	UFL : 6.70%

Odor : aromatic, oily
INCOMPAT/REACT: nitric acid, oxidizing agents
SOLUBILITY : water-slightly; sol in alcohols, benzene, carbon tetrachloride, ether

TOXICOLOGICAL PROPERTIES

Exposure Limits: TLV-TWA (ACGIH): 100.00 ppm PEL (OSHA): 100.00 ppm
STEL: 125.00 ppm IDLH: 2000.00 ppm

OTHER PROPERTIES :
Tox Data: INHAL : human TcLo: 100ppm/8hr
DERMAL : skn rbt LD50: 17800 mg/kg
ORAL : rat LD50: 3500mg/kg
CARCIN : -
MUTAGEN : -
REPRO TOX: exper teratogen
AQUATIC : 29ppm/96hr/bluegill/TLm/fresh water
OTHER TOX: TARGET ORGANS: Eye, Upper Resp, Skin, CNS
ROUTES OF EXP: Ingestion, Eye(Ocular), Skin Contact, Inhalation

PERSONAL PROTECTIVE MEASURES

RESPIRATORS : APR: dusty/windy condit or known high concent or >1 but <5ppm; SCBA: >5ppm
CARTRIDGE TYPE : GMC-H, AF3 (RACAL)
PROTECTIVE CLOTHING: Coverall: Saranex Gloves: Viton-8hr
SPEC PRECAUTIONS :

FIRST AID

INHALATION: move to fresh air, CPR if nec, SEEK MEDICAL ATTENTION
EYE/SKIN : flush w/lg amt of water IMMEDIATELY for 15 min, wash skin with soap/water, SEEK MEDICAL ATTENTION
INGESTION : SEEK MEDICAL ATTENTION IMMEDIATELY

SYMPTOMS

ACUTE : irritation of eyes, nose, throat, skin; weakness, dizziness, drowsiness, unconscious, CNS depressant. High concentr-
.- narcotic.
CHRONIC: skin rash, erythema, inflammation, dermatitis

DISPOSAL, FIRE, SPILLS (see attached sheet)

DISPOSAL: D FIRE: 6,7 LEAKS & SPILLS: 3,4,5,6,9
DECOMPOSITION PRODUCTS: CO, CO2

REFERENCES CONSULTED

NIOSH/OSHA Pocket Guide, Merck Index, ACGIH TLV Booklet, RTECS
OTHER REFERENCES: Sigma-Aldrich, OSHA, Poison Handbook

LAST REVISION DATE:
05/10/89

CHEMICAL CLASSIFICATION: Aromatic Hydrocarbon

Hazard Evaluation of Chemicals
Region V - Chicago

DATE : / /
JOB NO: _____

CHEMICAL NAME: Xylene, all isomers

SYN : Dimethylbenzene, Xylol
CAS NO: 1330-20-7 FORMULA: C6H4(CH3)2
DOT CLASS: FLAMMABLE

CHEMICAL PROPERTIES

Phys St: Liquid | Boil Pt: -- | Ionz Pot : 8.56ev ✓ | Fl Pt: 81.00°F
Mol Wt : 106.20 | Melt Pt: -- | Vap Press: 9.00 mmHg ✓ | LFL : 1.00%
Sp Gr : 0.86 | Frz Pt : -- | Odr Thr : 20.00ppm ✓ | UFL : 7.00%
Odor : aromatic odor, sweet
INCOMPAT/REACT: strong oxidizers
SOLUBILITY : practically insoluble in water

JB 5/16/90

TOXICOLOGICAL PROPERTIES

Exposure Limits: TLV-TWA (ACGIH): 100.00 ppm ✓ PEL (OSHA): 100.00 ppm ✓
STEL: 150.00 ppm ✓ IDLH: 1000.00 ppm

OTHER PROPERTIES :
Tox Data: INHAL : hum TClo: 200ppm
DERMAL : -
ORAL : rat LD50: 4300 mg/kg
CARCIN : -
MUTAGEN : exper
REPRO TOX: exper teratogen
AQUATIC : -
OTHER TOX: TARGET ORGANS: CNS, Eyes, GI Tract, Blood, Liver, Kidneys, Skin
ROUTES OF EXP: Ingestion, Eye(Ocular), Dermal Absorption, Skin Contact, Inhalation

JB 5/16/90

PERSONAL PROTECTIVE MEASURES

RESPIRATORS : AFR: dusty/windy condit or known high concent or >1 but <5ppm; SCBA: >5ppm
CARTRIDGE TYPE : GMC-H or A-3 (RACAL)
PROTECTIVE CLOTHING: Coverall: PE Tyvek Gloves: PVA, Viton (PVA degrades in water)
SPEC PRECAUTIONS :

FIRST AID

INHALATION: move to fresh air, artf resp if nec, SEEK MEDICAL ATTENTION
EYE/SKIN : flush w/water 15 minutes, wash skin with soap/water, SEEK MEDICAL ATTENTION
INGESTION : DO NOT INDUCE VOMITING, SEEK MEDICAL ATTENTION IMMEDIATELY

SYMPTOMS

ACUTE : vapor cause dizziness, headache, cough, pulmonary distress/edema, nausea/vomiting, abdominal cramps, narcotic in high concent, mild skin irritant
CHRONIC: possible liver and/or kidney damage, pulmonary congestion. Ingestion may be fatal.

DISPOSAL, FIRE, SPILLS (see attached sheet)

DISPOSAL: D FIRE: 6,7 LEAKS & SPILLS: 3,4,5,6,9
DECOMPOSITION PRODUCTS: CO, CO2

REFERENCES CONSULTED

NIOSH/OSHA Pocket Guide, Merck Index, Chris(vol. III), ACGIH TLV Booklet, RTECS
OTHER REFERENCES: NIOSH Guides, Sigma-Aldrich

CHEMICAL CLASSIFICATION: Hydrocarbons, Aromatic

LAST REVISION DATE:
~~10/17/89~~
5/16/90

Chemical Fact Sheet* Versi

ETHYLENE DIBROMIDE

The information in this sheet applies to workplace exposure resulting from processing, manufacturing, storing or handling and is not designed for the population at large. Any generalization beyond occupational exposures should not be made. The best industrial hyg practice is to maintain concentrations of all chemicals at levels as low as is practical.

Chemical Names: 1,2-Dibromoethane, sym-dibromoethane, ethylene bromide, glycol dibromide CAS 106-93-4.

Trade Names: Dowfume, EDB, DBE, Bromofume, Celmide, Soilbrom, Unifume and others.

Uses: As a fumigant, lead removing agent in gasoline, synthetic intermediate and a solve for resins, gums and waxes.

PHYSICAL INFORMATION

Appearance: Clear, colorless liquid.

Odor: Sweet, similar to chloroform. Minimum Detectable by Odor: 10 ppm.

Behavior in Water: Very slightly soluble, excess will sink.

Evaporation: Moderate; fumes are heavier than air.

HEALTH HAZARD INFORMATION

OSHA Standard: Average 8 hour exposure -- 20 ppm.

NIOSH Recommended Limit: Average 8 hour exposure -- 0.045 ppm.

ACGIH Recommended Limit: No measurable exposure permitted.

Short Term Exposure:

Inhalation: Levels of 75 ppm may cause irritation of the nose, throat and lungs. 10 ppm for 1 hour may cause diarrhea, abdominal pain and vomiting. Other symptoms may include headache, loss of appetite, swollen glands, pale skin coloring, insomnia, dizziness and depression. Accidental high exposure has caused symptoms as listed abo internal bleeding and death.

Skin: Contact with as little as 1 gram (1/28 ounce) may cause itching, swelling, red burning and blistering. May be absorbed through the skin and cause symptoms as liste under inhalation.

Eyes: May cause irritation of eyes and eyelids.

Ingestion: May cause vomiting, diarrhea, abdominal pain, nausea and damage to the li and kidneys. As little as 4.5 ml (about 1 teaspoon) has caused death.

Long Term Exposure:

May cause irritation of the throat, headaches, loss of appetite, swollen glands, pale insomnia, vomiting, diarrhea, abdominal pain and damage to the liver and kidneys. Ethylene dibromide causes cancer, birth defects and changes in the genetic material o laboratory animals. Handle with extreme caution.

*Prepared by the Bureau of Toxic Substance Assessment, New York State Department of Healt (For an explanation of the terms and abbreviations used see "Toxic Substances: How Toxic Toxic" available from the New York State Department of Health.

EMERGENCY AND FIRST AID INSTRUCTIONS

Inhalation: Move person to fresh air. Give artificial respiration or oxygen as required. See medical attention, if necessary.

Skin: Remove chemically soiled clothing immediately, taking to avoid contact with skin. Was affected area with soap and water for at least 15 minutes. Seek medical attention immedi

Eyes: Wash immediately with large amounts of running water for at least 15 minutes. Seek me attention immediately.

Ingestion: Seek medical attention immediately.

FIRE AND EXPLOSION INFORMATION

General: Not flammable or explosive at room temperature.

REACTIVITY

Materials to Avoid: Reacts violently with strong alkalies, such as lye or ammonia, oxidizing agents such as chlorine and permanganate, and reactive metals such as aluminum, sodium, potassium and magnesium.

Conditions to Avoid: High temperatures will cause breakdown to highly poisonous bromide fume

PROTECTIVE MEASURES

Storage and Handling: Store in a cool, dry place that is well-ventilated. Keep in tightly sea containers and away from light, heat, active metals and liquid ammonia.

Engineering Controls: Provide local exhaust or process enclosure. Sinks, showers, and eyewash stations should be readily available.

Protective Clothing (Should not be substituted for proper handling and engineering controls): contact is likely, wear safety goggles or faceshield, gloves, bib-type apron, boots, and overshoes. Rubber and leather will not protect from ethylene dibromide.

Protective Equipment: For any detectable levels use a self-contained breathing apparatus wit facepiece operated in a positive pressure mode or a combination Type C supplied-air respira with a full facepiece and an auxiliary self-contained breathing apparatus both operated i positive pressure mode. A supplied-air suit may be necessary. For escape use a gas mask w an organic vapor canister or an escape self-contained breathing apparatus.

Miscellaneous: Do not eat, drink or smoke while working with ethylene dibromide. Wash hands thoroughly with soap and water immediately after use and before eating and smoking.

PROCEDURES FOR SPILLS AND LEAKS

Move all workers from the spill area. Wear protective clothing and equipment and provide adequ ventilation to prevent accumulation of the vapor. Absorb spill on non-reactive material and sh into a container that is resistant to ethylene dibromide. For final disposal contact your re office of the New York State Department of Environmental Conservation.

For more information:
Contact the Industrial Hygienist or Safety Officer at your worksite or the New York State Department of Health, Bureau of Toxic Substance Assessment, 2 University Place, Albany, N York 12203.

DATE : / /
JOB NO: _____

CHEMICAL NAME: Lead

SYN : White lead, Plumbum, Inorganic Lead
CAS NO: 7439-92-1 FORMULA: Pb
DOT CLASS:

CHEMICAL PROPERTIES

Phys St: Solid	Boil Pt: 3164.00°F	Ionz Pot : —	Fl Pt: —
Mol Wt : 207.00	Melt Pt: 620.00°F	Vap Press: —	LFL : —
Sp Gr : 11.30	Frz Pt : —	Odr Thr : —	UFL : —

Odor : none
INCOMPAT/REACT: strong oxidizers, peroxides, active metals
SOLUBILITY :

TOXICOLOGICAL PROPERTIES

Exposure Limits: TLV-TWA (ACGIH): 0.01 ppm PEL (OSHA): — 0.006 ppm
STEL: — IDLH: —
OTHER PROPERTIES : PEL - 50ug/m3
Tox Data: INHAL : -
DERMAL : -
ORAL : rat TDLo: 750mg/kg
CARCIN : indefinite
MUTAGEN : -
REPRO TOX: exper teratogen
AQUATIC : -
OTHER TOX: TARGT ORGNS: GI Trct,CNS,Kid,Bld,Gingival Tissue
ROUTES OF EXP: Ingestion, Eye(Ocular), Skin Contact, Inhalation

PERSONAL PROTECTIVE MEASURES

RESPIRATORS : APR: dusty/windy condit or known high concent or >1 but <5ppm; SCBA: >5ppm
CARTRIDGE TYPE : GMC-H, AF3 (RACAL)
PROTECTIVE CLOTHING: Coverall: Saranex Gloves: Nitrile
SPEC PRECAUTIONS :

FIRST AID

INHALATION: move to fresh air, artf resp if nec, SEEK MEDICAL ATTENTION
EYE/SKIN : flush w/water 15 minutes, wash skin with soap/water, SEEK MEDICAL ATTENTION
INGESTION : give water, induce vomiting, SEEK MEDICAL ATTENTION IMMEDIATELY

SYMPTOMS

ACUTE : cumulative neurotoxin (prolong expos), stomach distress, vomtg, diarrhea, black stools, anemia, nervous system effects
CHRONIC: alimentary: abdm pain/discomf,constptn,diarrh neuromusc: musc weaknss,joint/musc pain,dizzy,insom, encephalic: brain involvment, stupor, coma,death-rare reprod: poison to m/f germ cells

DISPOSAL, FIRE, SPILLS (see attached sheet)

DISPOSAL: P FIRE: 13 LEAKS & SPILLS: 7,8,10
DECOMPOSITION PRODUCTS: toxic fumes of lead

REFERENCES CONSULTED

NIOSH/OSHA Pocket Guide, ACGIH TLV Booklet, RTECS
OTHER REFERENCES: Sigma-Aldrich, OSHA 1910., Handbook of Poisoning
a-29 CFR 1910.1025 7/1/89
CHEMICAL CLASSIFICATION: Heavy Metal

LAST REVISION DATE:
5/16/90