ECOLOGY AND ENVIRONMENT, INC.

DALLAS, TEXAS

MEMORANDUM

TO: Ed Sierra, RPO Region VI

THRU: K. H. Malone, Jr., FITOM

FROM: Brenda Nixon Cook, FIT Chemist BNC

DATE: March 21, 1989

SUBJ: Preliminary Assessment Report for Palmer Pack Warehouse
Houston, Texas (TXD006806582) x-ref in SA Vol. 1
TDD# F06-8901-24
PAN FTX0697PAA

I. Site Information

Palmer Pack Warehouse is an active warehouse facility located on 5.145 acres along the 1400 block of Lockwood Drive in Houston, Texas, Latitude 29°46'36" N, Longitude 95°19'42" W (Ref. 5). 63 drums of off-specification chemicals and 4,693 gallons of photographic and printing material were stored at this warehouse from November 1984 to November 1988. The warehouse is leased to Palmer under the designation of Lockwood "B" by Trammel Crow for Houston-St. Louis Properties Limited (Ref. 5). Houston-St. Louis Properties has owned the property since 1975 and the current lease agreement between Houston-St. Louis and Palmer dates from May 9, 1984 (Ref. 14). Previous realty information is not known.

The purpose of this Preliminary Assessment is to identify the hazards present at the site and the effects of potential off-site migration of contaminants.

II. Background/Operating History:

The Palmer Warehouse Company, along with its subsidiary, Palmer-Pack Co. Inc., operates five warehouses. The Palmer Warehouse Company operates the full distribution warehouses storing various commodities for their clients while Palmer Pack Company, Inc. packages polypropylene and polyethylene products (Ref. 5).

From November 1984 through March 1985, Palmer received 63 drums of off-specification chemicals and 4,693 gallons of photographic and printing supplies from SCI Equipment and Technology (SCI) (Ref. 5, p. 33) and its associated companies. SCI owners, Jack and Charles Colbert, were involved in the purchase of off-specification and waste chemicals for export (Ref. 5;

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Ref. 7). SCI materials were stored in warehouses and often abandoned. SCI is defunct and the Colbert brothers are serving sentences for fraud in federal prison (Ref. 5, Ref. 7).

As a result of an investigation into the illegal activities of the Colbert brothers, the EPA Houston RCRA and the Texas Water Commission personnel inspected the Palmer Warehouse on January 29, 1988. On February 10, 1988, a site inspection was performed by the EPA Emergency Response Branch. On May 18, 1988, the TAT conducted a site assessment of the facility. Based on the findings of the site assessment an imminent threat to human health was identified resulting in the issuance of an EPA administrative order for the removal of the abandoned SCI material (Ref. 5; Ref. 7).

On June 9, 1988, the SCI photographic and printing supplies were sold to Lund and Associates of Houston, Texas and removed from the Palmer warehouse (Ref. 5). On November 16, 1988, under supervision of the TAT, the remaining 63 drums were removed from the site (Ref. 15). On-site wastes were sent to approved disposal facilities (Ref. 6; Ref. 14).

III. Waste Containment/Hazardous Substances Identification

According to an EPA Action Memorandum dated June 22, 1988, the SCI material was deteriorating (Ref. 7). Of the 63 drums, 25 were rusting, 4 were dented and 3 were bulging (Ref. 7). Based on the TAT inventory, the removal manifests and chemical analysis, the contents of the drums were as follows (Ref. 5; Ref. 6):

Quantity (drums)	Chemical
19	Acetaldehyde
3	n,n-Dimethylformamide
5	Paraformaldehyde
1	2,4-Dichlorophenoxyacetic acid
4	Toxaphene
4	Zeolite
13	Aerosol A268
14	Alpha methyl styrene

The condition of the containers of SCI photographic and printing materials was not identified. Documentation states that some of the containers had leaked during the time they were stored at the warehouse (Ref. 5; Ref, 7). Upon discovery of leaks, Palmer personnel repackaged the material into overpack drums (Ref. 7). Based on the TAT inventory, some of the photographic and printing material contained the following hazardous constituents: potassium ferrocyanide, chrome alum, phosphoric acid, ammonium bichromate and ammonium hydroxide (Ref. 5).

Palmer Pack Warehouse
TXD006806582
X-ref in SA Vol. 1

IV. Pathway Characteristics

a. Air Characteristics

The gaseous mobility of the site wastes are high due to the volatility of the compounds. Pre-removal air monitoring was conducted with the organic vapor analyzer (OVA). OVA readings of 3 benzene-equivalents and 10 benzene-equivalents above background were recorded during the TAT site assessment (Ref. 5).

b. Ground Water Characteristics

The most important water bearing units in the Houston area are the Chicot and the Evangeline aquifers. The Chicot includes all sedimentary deposits from the land surface to the top of the Evangeline aquifer, and is approximately 1000 feet thick (Ref. 3). It is composed of interbedded sands, silts and clays of the Willis Sand, Bentley and Montgomery Formations, Beaumont Clay, and the quaternary alluvium, all from the Pleistocene Age. The underlying Evangeline aquifer is the primary source of fresh ground water in the Houston area. It is approximately 2000 feet thick in this area and extends from the base of the Chicot to the underlying Burkeville confining layer (Ref. 4). The Evangeline is composed of the Goliad Sand, from the Pliocene Age, and sections of the Fleming Formation from the Miocene Age. Lithologically, the Evangeline is characterized by layers of sand and gravel with interbedded clay and silt layers (Ref. 3; Ref. 4).

The City of Houston utilizes a combination of ground water and surface water to supply drinking water to residences within 4 miles of the site (Ref. 8; Ref. 9). Six municipal drinking water wells are located within four miles of the facility (Ref. 16). These wells are screened in the Evangeline aquifer at depths ranging from 680 to 2060 feet (Ref. 1). A net precipitation of -6.0 inches per year has been estimated (Ref. 2).

c. Surface Water Characteristics

Topography indicates that surface water drainage from the site flows southeast toward Buffalo Bayou. The most probable route of surface drainage is along the the railroad tracks and into Buffalo Bayou near the Turning Basin, a distance of 6330 feet (Ref. 9).

Buffalo Bayou flows east-southeast and enters the Turning Basin approximately 2 miles downstream of the site. From here to Galveston Bay, the Bayou is the Houston Ship Channel. The remainder of the 15-mile downstream in-water segment lies entirely within the Houston Ship Channel. Surface water along this migration pathway is used for limited recreation (canoeing), navigation, and by industries along the channel for cooling water. It is not used for irrigation or drinking water (Ref. 13).

The size of the drainage area is the area of the site (5.145 acres) (Ref. 5), since there are no areas upgradient of the site (Ref. 9). The average annual-stream flow for Buffalo Bayou is 320 cubic feet per second (Ref. 18). The 2-year 24-hour rainfall is 5 inches (Ref. 2). Palmer Pack Warehouse is not located in a flood plain, therefore the potential for flooding is low (Ref. 17).

d. On-Site

The abandoned SCI materials were on-site from 1985-1988. During this time, the contents of the drums and packaged material may have contaminated the soil. Migration of contaminants in soil is possible via the air and surface water routes.

V. Targets:

There are at least six water wells that service the metropolitan Houston area within four miles of the site (Ref. 16). All of Houston is serviced by a system which receives its water from a combination of these wells and surface water from Lake Houston (Ref. 8). The nearest downgradient surface water body is Buffalo Bayou. Buffalo Bayou is primarily a storm water outlet with limited recreational usage (Ref. 9; Ref. 13). Water is obtained from Buffalo Bayou for industrial use only. Buffalo Bayou is not a consumptive water source.

The warehouse is located in a predominantly residential district. Located within a one-mile radius of the site are three public parks, a hospital and approximately 11,000 residents (Ref. 5; Ref. 10). No known environmentally sensitive areas are located within four miles of the site (Ref. 12).

VI. Other Regulatory Involvement

The site was inspected by the EPA Houston RCRA inspectors and the Texas Water Commission personnel on January 29, 1988. On February 10, 1988 a site inspection was conducted by the EPA Emergency Response Branch. On May 18, 1988 a facility inspection and a site inventory were performed by the TAT. As a result of the TAT inspection, an Action Memorandum was generated, resulting in the issuance of an administrative order on June 22, 1988 for the removal of the SCI material. On November 16, 1988, under supervision of the TAT, the remaining SCI material was removed from the site (Ref. 5; Ref. 7; and Ref. 15).

VII. Conclusions

The Palmer Warehouse Co. and its subsidiary, Palmer Pack Co. Inc., are located at 1040 Lockwood Drive in Houston, Texas. They operate five distribution warehouses. The Palmer Warehouse Company received off-specification chemicals and photographic and printing supplies from SCI Inc., from November 1984 through March 1985. These materials were stored in the Palmer Pack warehouse located on Lockwood Drive. In June of 1988, an administrative order was issued for the removal of the SCI material based on the presence of an imminent threat to human health originating from this facility. As of November 16, 1988, all SCI material had been removed. The findings of this report are based on pre-removal conditions. There is no documentation stating the presence of contaminants outside the warehouse. However, during the time the SCI material was on-site, leakage of hazardous material to the environment may have occurred. Further information is needed to determine if any hazardous constituents remain on-site.

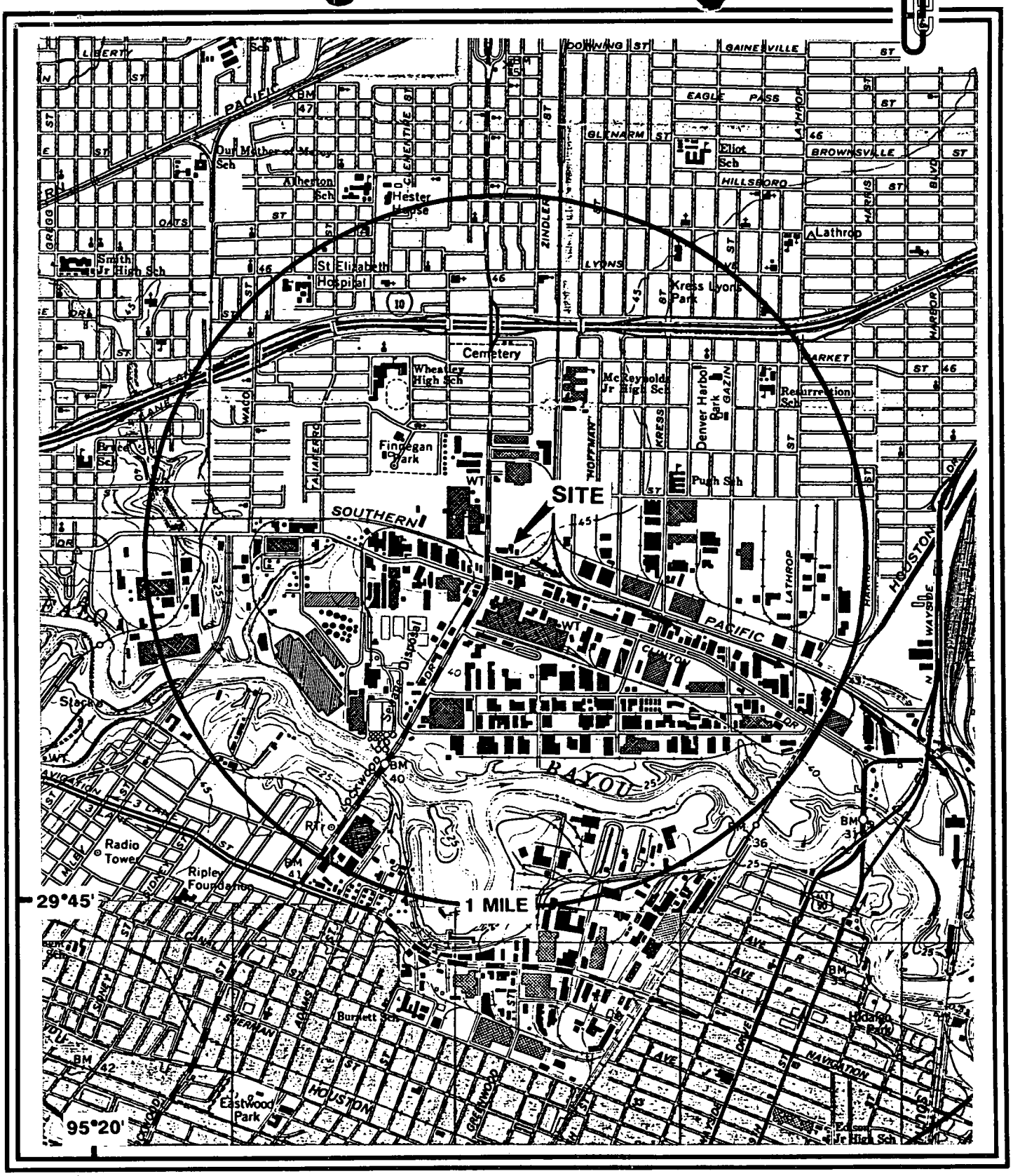
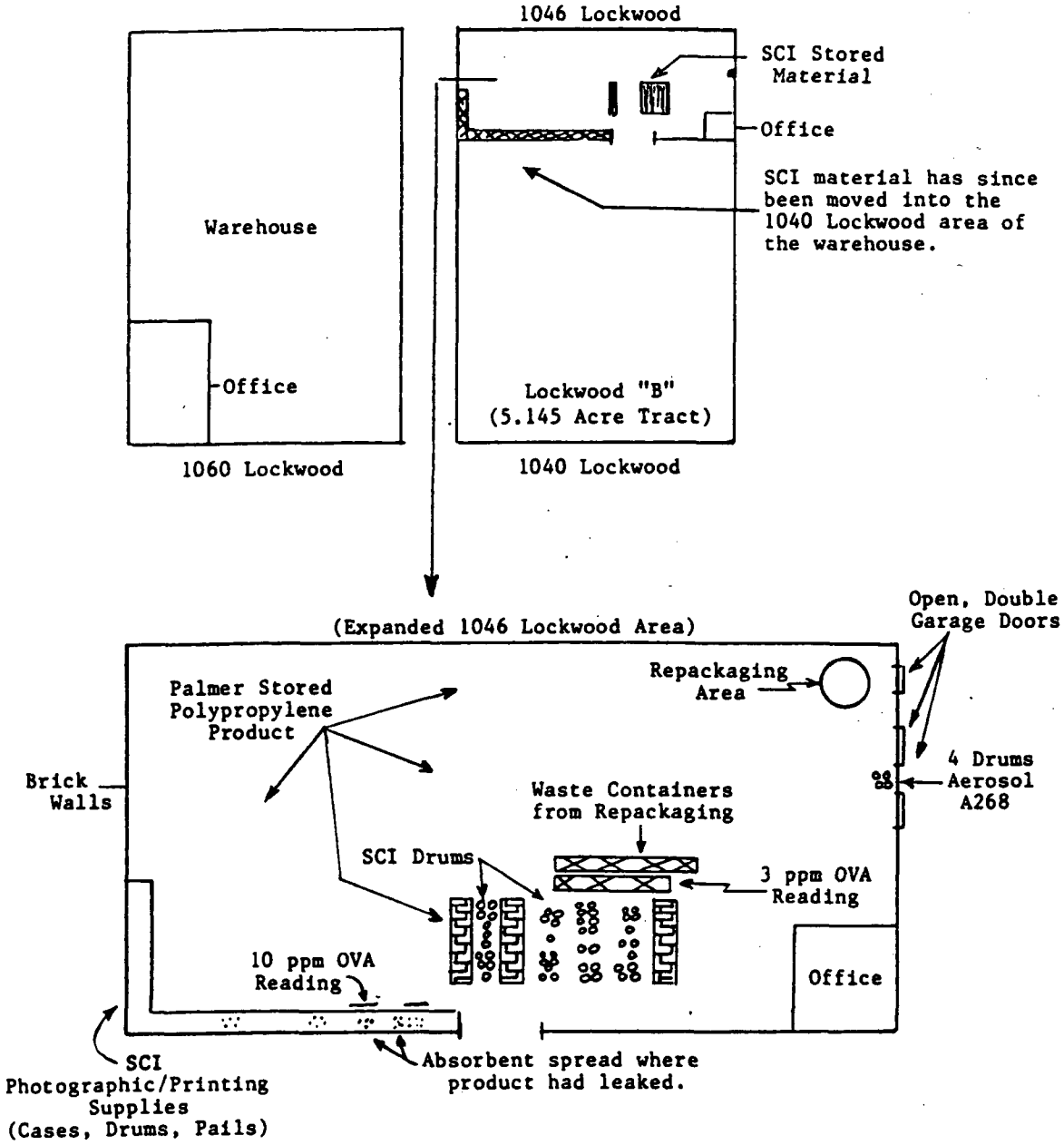


FIGURE 1
SITE LOCATION MAP
PALMER PACK WAREHOUSE
HOUSTON, TEXAS
TXD006806582



SOURCE: ECOLOGY AND ENVIRONMENT, INC. (TAT) HOLLY L. GRAY, JULY 21, 1988

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NOT TO SCALE

FIGURE 2
SITE SKETCH
PALMER PACK WAREHOUSE
HOUSTON, TEXAS
TXD006806582

DECLASSIFIED
Date: 5/17/89 ORG:
SF:

*****~~CONFIDENTIAL~~*****PRE-DECISIONAL DOCUMENT*****

PRESCORE ANALYSIS HRS SCORESHEET

Site Name: Palmer Pack Warehouse
EPA ID No: TXD006806582
TDD No: F06-8901-24
City: Houston
County: Harris
State: Texas

Site Evaluator: Brenda Nixon Cook
Region VI FIT
Date: February 17, 1989

POTENTIAL RELEASES

[ ] Ground Water
[ ] Surface Water
[X] Air
[ ] On-Site/Direct Contact

SCORING SCENARIOS		Preliminary	Projected
GROUNDWATER ROUTE SCORE (Sgw)	=	10.88	13.61
SURFACE WATER ROUTE SCORE (Sw)	=	2.98	4.48
AIR ROUTE SCORE (Sa)	=	0	45.00
TOTAL SCORE (Sm)	=	6.52	27.30

NEW HRS MODEL CONSIDERATIONS

GROUNDWATER ROUTE: The ground water population score would not increase for the four-mile radius. Population within a three-mile radius already exceeds the maximum.

SURFACE WATER ROUTE: The surface water score will not be affected by the 15-mile radius since Buffalo Bayou's 15-mile downstream segment encompasses no drinking or irrigational intakes or sensitive environments.

AIR ROUTE: Potential of air release may exist due to disturbances of the soil.

ON-SITE ROUTE: The possibility exists for employees to come in contact with any contaminants not removed with the SCI material.

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***** GROUND WATER ROUTE WORKSHEET *****

	Preliminary	Reference	Projected	Reference
1. OBSERVED RELEASE	0		0	
2. ROUTE CHARACTERISTICS				
DEPTH TO AQUIFER OF CONCERN (x2)	0	1	0	1
NET PRECIPITATION	1	2	1	2
PERMEABILITY OF UNSATURATED ZONE	0	1, 2, 3, 4	1	1, 2, 3, 4
PHYSICAL STATE	3	5, 6	3	5, 6
ROUTE CHARACTERISTIC SCORE	4		5	
3. CONTAINMENT	3	5, 6, 7	3	5, 6, 7
4. WASTE CHARACTERISTICS				
TOXICITY/PERSISTENCE	18	6, 2	18	6, 2
HAZARDOUS WASTE QUANTITY	2	5, 6	2	5, 6
WASTE CHARACTERISTICS SCORE =	20		20	
5. TARGETS				
GROUNDWATER USE (x3)	6	8	6	8
DISTANCE TO NEAREST WELL/POPULATION SERVED	20	8, 9, 10	20	8, 9, 10
TOTAL TARGET SCORE =	26		26	
(1x4x5) or (2x3x4x5) =	6240		7800	
GROUNDWATER ROUTE SCORE				
$\frac{(1x4x5) \text{ or } (2x3x4x5)}{57,330} \times 100 =$	10.88		13.61	

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***** SURFACE WATER ROUTE WORKSHEET *****

	Preliminary	Reference	Projected	Reference
1. OBSERVED RELEASE	0		0	
2. ROUTE CHARACTERISTICS				
FACILITY SLOPE AND INTERVENING TERRAIN	0	9	0	9
1-YEAR 24-HOUR RAINFALL	3	2	3	2
DISTANCE TO NEAREST SURFACE WATER (x2)	2	2	2	2
PHYSICAL STATE	3	5, 6	3	5, 6
ROUTE CHARACTERISTIC SCORE	8		8	
3. CONTAINMENT	2	5, 6, 7	3	5, 6, 7
4. WASTE CHARACTERISTICS				
TOXICITY/PERSISTENCE	18	2, 6	18	2, 6
HAZARDOUS WASTE QUANTITY	2	6	2	6
WASTE CHARACTERISTICS SCORE =	20		20	
5. TARGETS				
SURFACE WATER USE (x3)	6	8, 11, 13	6	8, 11, 13
DISTANCE TO A SENSITIVE ENVIRONMENT (x2)	0	12	0	12
POPULATION SERVED/ DISTANCE TO DOWNSTREAM WATER INTAKE	0	8	0	8
TOTAL TARGET SCORE =	6		6	
(1x4x5) or (2x3x4x5) =	1920		2880	
SURFACE WATER ROUTE SCORE = $\frac{(1x4x5) \text{ or } (2x3x4x5)}{64,350} \times 100 =$	2.98		4.48	

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***** AIR ROUTE WORKSHEET *****

	Preliminary	Reference Memo to file	Projected	Reference Memo to file
1. OBSERVED RELEASE	0		45	
DATE AND LOCATION				
2. WASTE CHARACTERISTICS				
REACTIVITY AND INCOMPATIBILITY	2	5, 7	2	5, 7
TOXICITY (x3)	9	6, 2	9	6, 2
HAZARDOUS WASTE QUANTITY	2	6	2	6
WASTE CHARACTERISTICS SCORE =	13		13	
3. TARGETS				
POPULATION WITHIN FOUR MILES	24	10	24	10
DISTANCE TO SENSITIVE ENVIRONMENT (x2)	0	9	0	9
LAND USE	3	5	3	5
TOTAL TARGET SCORE =	27		27	
(1x2x3) =	0		15,795	
AIR ROUTE SCORE				
$\frac{(1x2x3)}{35,100} \times 100$ =	0		45	

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Preliminary S_m WORKSHEET

	S	S^2
Groundwater Route Score (Sgw)	10.88	118.37
Surface Water Route Score (Ssw)	2.98	8.88
Air Route Score (Sa)	0	0
$Sgw^2 + Ssw^2 + Sa^2$		127.25
$(Sgw^2 + Ssw^2 + Sa^2)^{1/2}$		11.28
$(Sgw^2 + Ssw^2 + Sa^2)^{1/2} / 1.73 = S_M =$		6.52

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Projected S_m WORKSHEET

	S	S^2
Groundwater Route Score (Sgw)	13.61	185.23
Surface Water Route Score (Ssw)	4.48	20.07
Air Route Score (Sa)	45.00	2,025.00
$Sgw^2 + Ssw^2 + Sa^2$		2,230.30
$(Sgw^2 + Ssw^2 + Sa^2)^{1/2}$		47.23
$(Sgw^2 + Ssw^2 + Sa^2)^{1/2} / 1.73 = S_M =$		27.30

PALMER PACK WAREHOUSE

HOUSTON, TEXAS

MEMO TO FILE

1) The nearest known well drawing from aquifer of concern is the industrial well LJ-65-14-810. Depth to groundwater and permeability of the unsaturated zone values are based on this well log. The nearest known domestic well is the City of Houston Northeast #3a, distance to well/population served value for the prescore is based on this well.

2) Hazardous waste quantities for all routes are based on pre-removal volumes.

3) Population served is based on the population of Houston since Houston's public water supply is a mixture of surface and groundwater. There is one municipal drinking water well within a three mile radius.

4) There is no documentation stating the presence of any surface water containment system. A value of 2 is assigned for the preliminary score since the drums were known to be leaking. The "worst case" value is used for the projected score.

5) An observed release is projected for the air route based on the following information: 1) readings of 3 and 10 benzene equivalents were recorded on the OVA; 2) compounds on site were volatile; 3) a human health hazard was established on site based on the air pathway; and 4) there is uncertainty as to whether or not all sources (i.e., possibility of contaminated soils) were removed with the SCI material.

REFERENCES

Reference Number	Description of the Reference
1	Gabrysh, Nafel; McAdoo, Bennet. USGS Groundwater Data for Harris County, Texas, Volume II. Records of Wells 1892 - 1972. Report 178. January 1974.
2	Uncontrolled Hazardous Waste Site Ranking System. A Users' Manual. 47FR31219-31243, 16 July 1982 (Appendix A CERCLA).
3	Jergensen, Donald G., USGS. Analog Studies of Groundwater Hydrology in the Houston District, Texas. Report 190. February 1975.
4	Baker, E. T., USGS. Stratigraphic and Hydrogeologic Framework of Part of the Coastal Plain of Texas. Report 236. July 1979.
5	Gray, Holly L., Region VI, Technical Assistance Team. Site Assessment Report for Palmer Warehouse, Houston, Harris County, Texas. TXD006806582. August 19, 1988.
6	Texas Water Commission. Uniform Hazardous Waste Manifests for Palmer Warehouse. November 16, 1988.
7	Hammack, Patrick L., EPA Emergency Response Section. Request for Removal Action at the Palmer Warehouse Site. Houston, Harris County, Texas. TXD006806582. June 22, 1988.
8	ROC. To: Don McInnes, City of Houston Public Works. From: Kelly Bowles, FIT Geologist, EPA Region VI. Re: Ground Water and Surface Water Use by the City of Houston. January 5, 1989.
9	USGS 7.5 Minute Topographic Map. Houston Heights, Texas. 1982. Bellaire, Texas. 1982. Settegast, Texas. 1982. Park Place, Texas. 1982. Pasadena, Texas. 1982.
10	U. S. Department of Commerce. Bureau of the Census. Census Tracts, Houston, Texas. 1980.
11	ROC. To: Dr. Herbert McKee, City of Houston Health Department. From: Kelly Bowles, FIT Geologist, EPA Region VI. Re: Lead Products Facility Site and Buffalo Bayou. January 19, 1989.
12	ROC. To: Julie Massey, U.S. Fish and Wildlife Service. From: Kelly Bowles, FIT Geologist, EPA Region VI. Re: Sensitive Environments along Buffalo Bayou. January 19, 1989.
13	ROC. To: Don McInnes, Houston Public Works. From: Kelly Bowles, FIT Geologist, EPA Region VI. Re: Buffalo Bayou. January 5, 1989.

Reference Number	Description of the Reference
14	United States Environmental Protection Agency, Region VI. Administrative Order Docket Number, CERCLA-VI-06-88. Re: Palmer Warehouse Site. June 22, 1988.
15	Gray, Holly L., Region VI, Technical Assistance Team. Logbook for Palmer Warehouse. TDD# F06-8810-22. November 16, 1988.
16	ROC. To: Don McInnes, City of Houston Public Works. From: Brenda Nixon Cook, FIT Chemist, EPA Region VI. Re: Municipal Water Wells within Four Miles of Palmer Pack Warehouse. February 17, 1989.
17	National Flood Insurance Program. Flood Insurance Rate Map. City of Houston, Panel 125 of 195. September 27, 1985.
18	Letter. To: Kelly Bowles, FIT Geologist, EPA Region VI. From J. C. Fisher, Supervisory Hydrologist, Geological Survey. U.S. Department of the Interior. Re: Daily Mean Discharge Data for Buffalo Bayou. January 12, 1988.
19	U.S. Department of Commerce. Bureau of the Census. Number of Inhabitants, Texas. 1986.

THIS DOCUMENT CONTAINED CONFIDENTIAL INFORMATION WHICH WAS REFILED TO THE PRIVACY ACT/HEALTH CONFIDENTIAL (PC) PHASE/ACTIVITY

DOC # T658200007

DATE: January 1974

TITLE: Reference 01: TX Water Development Board, Report 178, Ground Water Data for Harris County, TX, Volume II, Record of Wells, 1892-1972.

REF 01

TEXAS
WATER
DEVELOPMENT
BOARD

GB
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Vol. II (a)

Report 178

GROUND-WATER DATA FOR HARRIS COUNTY, TEXAS

VOLUME II

RECORDS OF WELLS, 1892-1972

January 1974

Brenda Wilson

REF 02

Uncontrolled Hazardous Waste Site Ranking System

A Users Manual
(HW-10)

Originally Published in
the July 16, 1982, *Federal Register*

United States
Environmental Protection
Agency

1984

REF 03

TEXAS WATER DEVELOPMENT BOARD

REPORT 190

ANALOG-MODEL STUDIES OF GROUND-WATER HYDROLOGY IN THE HOUSTON DISTRICT, TEXAS

By

Donald G. Jorgensen
U.S. Geological Survey

This report was prepared by the U.S. Geological Survey
under cooperative agreement with the
Texas Water Development Board
and the City of Houston

February 1975

Second Printing
August 1975

ANALOG-MODEL STUDIES OF GROUND-WATER HYDROLOGY IN THE HOUSTON DISTRICT, TEXAS

INTRODUCTION

Purpose and Scope of the Project

Continual declines of water levels in wells, land-surface subsidence, and salt-water encroachment are problems related to ground-water pumping in the Houston district that necessitate additional studies of the hydrologic system.

This study was begun in 1970 by the U.S. Geological Survey in cooperation with the city of Houston and the Texas Water Development Board. The principal purpose was to develop a means for forecasting declines in the altitudes of the potentiometric surfaces (levels to which water will rise in tightly cased wells) under various conditions of pumping. Because of the complexity of the hydrologic system, an electric analog model was chosen as the most suitable device for analyzing the system and simulating future responses.

This report presents the results of the geologic and hydrologic studies, discusses the theory and construction of the analog model, and presents the simulation of the declines in the altitudes of the potentiometric surfaces as determined by using the model.

Most of the data upon which this report is based are available in reports by the U.S. Geological Survey and the Texas Water Development Board (see references) or in the files of the U.S. Geological Survey in Houston. Data are obtained through a continuing cooperative program of the U.S. Geological Survey, the Texas Water Development Board, the city of Houston, and the city of Galveston.

For those readers interested in using the metric system, metric equivalents of English units of measurements are given in parentheses. The English units used in this report may be converted to metric units by the following conversion factors:

From		Mutiply by	To obtain	
Unit	Abbreviation		Unit	Abbreviation
cubic foot	ft^3	0.028317	cubic meter	m^3
foot	ft	0.3048	meter	m
foot per day	ft/day	0.3048	meter per day	m/day
foot squared per day	ft^2/day	0.0929	meter squared per day	m^2/day
inch	in	2.540	centimeter	cm
million gallons	10^6 gal	3.785	cubic meters	m^3
square mile	mi^2	2.590	square kilometer	km^2

Description of the Area

The Houston district, as used in this report, consists of all of Harris, Waller, and Fort Bend Counties and parts of Galveston, Montgomery, Brazoria, Chambers, and Liberty Counties (Figure 1). The area of the district is approximately 6,600 square miles (17,100 square kilometers).

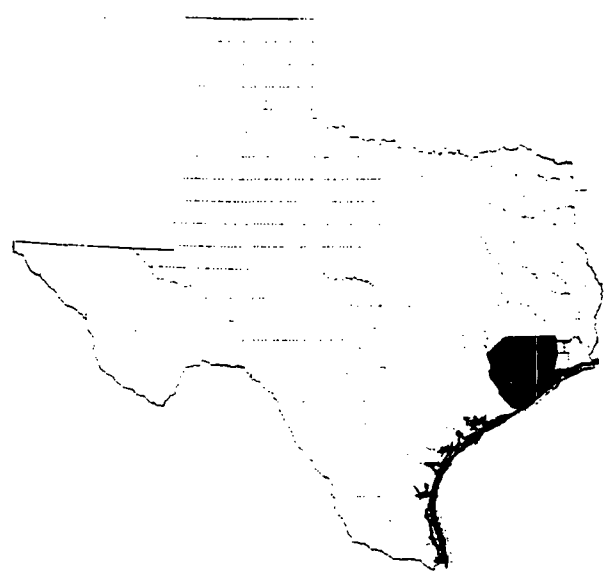

Figure 1.—Location and Extent of the Houston District

Except for a small area in Montgomery and Waller Counties, the land surface is nearly flat and featureless;

the only significant relief is in the valleys of the streams. The land is generally treeless in the rural areas from Houston southeast to Galveston.

The climate of the Houston district is characterized by mild winters and hot summers. The lowest temperature recorded at Houston was 15°F (-9.5°C) and the maximum temperature was 108°F (42°C). The mean annual temperature is 69.2°F (20.6°C). The 30-year average (1931-60) rainfall at Houston was 45.95 inches (116.7 centimeters); monthly rainfall is distributed uniformly throughout the year.

The Houston district has a large and diversified industrial economy, but also has extensive agricultural developments. Large amounts of water are used by industry for processing and cooling purposes and by rice and cotton growers for irrigation. The rapid growth and development of the district are due in part to the availability of large amounts of inexpensive ground-water supplies. The locations of the major pumping areas are shown on Figure 2.

Previous Studies

Among the more comprehensive earlier reports describing the geology and hydrology of the Houston district is the report by Lang and others (1950). Pettit and Winslow (1957) summarized the geology and ground-water resources of Galveston County. The relation of salt water to fresh ground water in Harris County was discussed by Winslow and others (1957). Land-surface subsidence and its relation to the withdrawal of ground water in the Houston-Galveston area was first reported by Winslow and Doyel (1954) and later by Gabrysch (1969).

Previous ground-water investigations were made in Waller County (Wilson, 1967); Liberty County (Anders and others, 1968); Montgomery County (Popkin, 1971); Fort Bend County (Wesselman, 1972); Brazoria County (Sandeen and Wesselman, 1973); and Chambers County (Wesselman, 1971). These studies provided relatively recent data on the ground-water resources and ground-water development in most of the Houston district exclusive of Harris and Galveston Counties.

A report containing data on ground-water withdrawals and water-level declines in Galveston and Harris Counties was prepared by Gabrysch (1972), and the role of groundwater in the development of the water system for the city of Houston was described in reports by Turner, Collie and Braden, Inc. (1966, 1972).

A report by Wood and Gabrysch (1965) describes the results of the first analog-model study of ground-water hydrology in the Houston district. The usefulness of the first analog model was limited because the simulations required that the aquifers be operated independently of each other and because the results of pumping in the western part of the area could not be simulated. Evaluation of the performance of the first model indicated that improvement in aquifer designation was needed and that the transmissivity of the aquifers and vertical leakage between the aquifers were not adequately modeled.

Acknowledgments

The author expresses his appreciation to Mr. D. E. VanBuskirk of the city of Houston Water Department and to the well owners and drillers who supplied pertinent information for this study. The aquifers in the district were mapped by John Wesselman, U.S. Geological Survey, and the model was designed and constructed by William Bruns, U.S. Geological Survey.

GEOHYDROLOGY

The geologic formations from which most of the ground water is pumped in the Houston district are composed of sedimentary deposits of gravel, sand, silt, and clay. The formations, from oldest to youngest, that form important hydrologic units are: The Catahoula Sandstone and Fleming Formation of Miocene age; the Goliad Sand of Pliocene age; the Willis Sand, Bentley and Montgomery Formations, and Beaumont Clay of Pleistocene age; and alluvium of Quaternary age (Table 1). Correlation of the hydrologic units from northern Montgomery County to the Gulf of Mexico is shown by the chart on Figure 3.

With exception of the alluvium and the Goliad Sand, the formations crop out in belts that are nearly parallel to the shoreline of the Gulf of Mexico. The younger formations crop out nearer the Gulf and the older ones farther inland. All the formations thicken downdip so that the older formations dip more steeply than the younger ones. Locally, however, the occurence of salt domes and faults may cause reversals of the regional dip and thickening or thinning of individual beds.

Salt domes are cylindrical structures resulting from the upward movement of salt masses that are probably of Mesozoic age. In some areas, the salt domes penetrate the uppermost aquifer and nearly reach the surface. In

Table 1.—Geologic and Hydrologic Units Used in This Report and In Recent Reports on Nearby Areas

This report				Wood and Gabrysch (1965)	Sandeen and Wesselman (1969)	Wilson (1967)	Popkin (1971)	Lang, Winslow, and White (1950)	Pettit and Winslow (1957)	Wesselman (1971)	Anders and others (1968)	Wesselman (1972)
System	Series	Stratigraphic unit	Aquifer	Houston district	Brazoria County	Austin and Waller Counties	Montgomery County	Houston district	Galveston County	Chambers and Jefferson Counties	Liberty County	Fort Bend County
Quaternary	Holocene	Quaternary alluvium	Chicot aquifer: Upper unit	Confining layer and Alta Loma Sand of Rose (1943)	Chicot aquifer: Upper unit	Alluvium of the Brazos River	Chicot aquifer	Alluvial deposits	Beach and dune sand	Chicot aquifer: Upper unit	Chicot aquifer	Chicot aquifer: Upper unit
	Pleistocene	Beaumont Clay				Evangeline aquifer (May contain unidentifiable parts of basal Chicot aquifer along the edges of Brazos River flood plain or along southern part of both counties)		Beaumont Clay	Beaumont Clay			
		Montgomery Formation						"Alta Loma Sand"	"Alta Loma Sand"			
		Bentley Formation	Chicot aquifer: Lower unit		Chicot aquifer: Lower unit					Chicot aquifer: Lower unit	Chicot aquifer	Chicot aquifer: Lower unit
		Willis Sand						Zone 7	Lissie Formation			
								Zone 6				
Tertiary	Pliocene	Goliad Sand	Evangeline aquifer	Heavily pumped layer	Evangeline aquifer		Evangeline aquifer	Zone 5		Evangeline aquifer	Evangeline aquifer	Evangeline aquifer
	Miocene	Fleming Formation	Burkeville confining layer	Zone 2		Burkeville aquiclude	Burkeville aquiclude			Burkeville aquiclude	Burkeville aquiclude	Burkeville aquiclude
			Jasper aquifer: Upper unit			Jasper aquifer	Jasper aquifer: Upper part of Jasper	Zone 4		Jasper aquifer	Jasper aquifer	Jasper aquifer
								Zone 3				
			Jasper aquifer: Lower unit				Jasper aquifer: Lower part of Jasper	Zone 2				
								Zone 1				

most instances, however, the domes pierce only the lower aquifers. Ground-water circulation within the vicinity of the domes may result in salt water contamination.

Faults in the area may have several hundred feet of displacement in the older Tertiary formations, but displacement tends to decrease upward so that the faulting may not be apparent at the surface; generally, the geologic units containing fresh water are not displaced enough to disrupt hydraulic continuity.

Description of the Water-Bearing Units

Chicot Aquifer

The Chicot aquifer is composed of the Willis Sand, Bentley Formation, Montgomery Formation, Beaumont Clay, and Quaternary alluvium (Table 1). The Chicot includes all deposits from the land surface to the top of the Evangeline aquifer (Figure 4).

The basis for separating the Chicot aquifer from the underlying Evangeline aquifer is primarily a difference in hydraulic conductivity, which in part causes the difference in the altitudes of the potentiometric surfaces in the two aquifers.

In most of the Houston district, the Chicot aquifer consists of discontinuous layers of sand and clay of about equal total thickness, and in some parts of the district, the aquifer can be separated into an upper and lower unit. Throughout most of Galveston County and southeast Harris County, the basal part of the lower Chicot aquifer is formed by a massive sand section with high hydraulic conductivity. (See Figure 4.) This sand unit, which is heavily pumped, is known locally as the Alta Loma Sand. In many previous reports, the unit is identified as the Alta Loma Sand of Rose (1943). The term Alta Loma Sand is not often used in this report because the stratigraphic relationships are not clear.

If the upper unit of the Chicot aquifer cannot be defined in a particular area, the aquifer is said to be undifferentiated. The areal extent of the upper unit roughly corresponds to the areal extent of the Beaumont Clay. The areas in which the aquifer cannot be differentiated into units are mostly in the northern part of the district (Figure 5).

Wells that are completed in the uppermost sand layers of the Chicot aquifer and that have water levels that are distinctly higher than water levels in wells completed in the underlying sand layers are considered to produce water from the upper unit.

The transmissivity of the Chicot aquifer ranges from zero to about 20,000 ft^2/day (feet squared per day) or 1,858 m^2/day (meters squared per day). The storage coefficient ranges from 0.0004 to 0.20 (Figure 6). The larger values of the storage coefficient occurs in the northern part of the district where the aquifer is partly or totally under water-table conditions.

Evangeline Aquifer

The Evangeline aquifer, which is the most important source of fresh ground water in the Houston metropolitan area, consists of layers of sand and clay that are present throughout the district except where the unit is pierced by salt domes (Figure 7). The aquifer is underlain by the Burkeville confining layer.

The transmissivity of the Evangeline aquifer ranges from less than 5,000 ft^2/day (460 m^2/day) to about 15,000 ft^2/day (1,400 m^2/day). (See Figure 8.) In general, the horizontal hydraulic conductivity of the Evangeline aquifer is less than the horizontal hydraulic conductivity of the Chicot aquifer, but because the Evangeline is generally thicker than the Chicot, it is generally more transmissive.

The storage coefficient of the Evangeline ranges from about 0.0005 to 0.0002 where it occurs under artesian conditions; in the outcrop area, where the aquifer is under water-table conditions, the storage coefficient ranges from greater than 0.002 to 0.20.

Burkeville Confining Layer

The Burkeville confining layer, which in the outcrop area is in the upper part of the Fleming Formation of Tertiary age, is composed mostly of clay but contains some layers of sand. The Burkeville restricts the flow of water except where it is pierced by salt domes and in the northeastern part of the district where it contains many water-yielding sand layers. The Burkeville is underlain by the Jasper aquifer.

Declines in the Altitudes of the Potentiometric Surfaces

Records of ground-water withdrawals in the Houston district date back to 1887, and records exist for probably 90 percent of the total withdrawals.

Use of ground water increased slowly until about 37, when rapid industrialization increased the rate of use. In 1955, surface water from the San Jacinto River (Lake Houston) became available, and the use of ground water remained relatively constant until 1962. From 1962 to 1970, the use of ground water increased to about 575 mgd (million gallons per day) or 2.2 million m^3/day (cubic meters per day). The historic withdrawals of ground water for 1890-1970 and the predicted withdrawals for 1971-80 are shown on Figure 9.

The pumping of large quantities of ground water has caused large declines in the altitudes of the potentiometric surfaces in the aquifers, except in the upper unit of the Chicot. The declines from 1890 to 1953, from 1890 to 1960, and from 1890 to 1970 in the lower unit of the Chicot aquifer and in the Chicot aquifer undifferentiated are shown on Figures 10, 11, and 12. Figures 13, 14, and 15 show the decline of the altitude of the potentiometric surface in the Evangeline aquifer for the same periods.

By 1970, the altitude of the potentiometric surface had declined a maximum of about 330 feet (100 meters) in the lower unit of the Chicot aquifer and Chicot aquifer undifferentiated and about 430 feet (130 meters) in the Evangeline aquifer.

Not enough data are available to map the decline of the altitude of the potentiometric surface in the upper unit of the Chicot aquifer.

Houston Area

Nearly all the ground water pumped in the Houston area (Figure 2) is from wells screened in the Evangeline or Chicot aquifers, and many of the wells are screened in both aquifers. (The reader should note that the Houston area is only a part of the Houston district.) The declines of water levels in wells screened in each of the aquifers are shown on Figure 16. Locations of the wells are shown on Figure 2.

Declines in the Evangeline aquifer and the lower unit of the Chicot aquifer have been the greatest. The upper unit of the Chicot is relatively undeveloped; therefore, the decline of water levels shown on Figure 16 for the upper unit of the Chicot is due in part to the discharge of water to the lower unit.

Pasadena Area

The Pasadena area is an industrialized area east of the Houston area and mostly west of the San Jacinto River (Figure 2). Most of the ground water pumped in this area is from the Evangeline aquifer, but a considerable amount is withdrawn from the lower unit of the Chicot in the southeastern part of the area. A small and mostly unrecorded amount is pumped from the upper unit of the Chicot.

Figure 17 shows the decline of water levels in three wells, each of which is screened in a different water-bearing unit. The decline of the altitude of the potentiometric surface in the upper unit of the Chicot is not as great as the decline in either the Evangeline or the lower unit of the Chicot. The decline in the upper unit of the Chicot is attributed to discharge to the lower unit and to a small amount of pumping.

Katy Area

The Katy area is an agricultural area west of the Houston area and includes the northern and western parts of Harris County, about half of Waller County, and northern Fort Bend County (Figure 2).

Ground water is used exclusively in the Katy area and most of it is used for rice irrigation. Most of the water pumped is from the lower unit of the Chicot aquifer, the Chicot aquifer undifferentiated, and the Evangeline aquifer. In the northern part of Fort Bend County, along the Brazos River, some water is pumped from the alluvium, which is a part of the upper unit of the Chicot aquifer.

Figure 18 shows the water-level declines in well LJ-65-04-507, completed in the Chicot aquifer undifferentiated and in well LJ-65-04-607, completed in the Evangeline aquifer. Declines are greater in wells screened in the Evangeline aquifer than in wells screened in the Chicot aquifer undifferentiated.

Baytown-LaPorte Area

The Baytown-LaPorte area extends eastward from the Pasadena area to the Chambers County line (Figure 2). It is primarily an industrial area, in which most of the ground water used is pumped from the lower unit of the Chicot aquifer.

Figure 19 shows the water-level declines in well LJ-65-24-606, screened in the Evangeline aquifer and in well LJ-65-24-501, screened in the lower unit of the Chicot aquifer. Although most withdrawals in the area are from the lower unit of the Chicot, the rate of decline in the Evangeline is nearly as large as the decline in the lower unit of the Chicot.

a result of pumping. The northern part of the district also has the highest vertical leakage, which allows water to move easily from the surface to the Chicot aquifer.

Limitations on Use of the Analog Model

The values of the parameters modeled are rational values for the hydrologic system. Further investigation and new data will allow refinements to be made and will allow more accurate determination of the values for the parameters modeled.

The model was not designed to simulate the effects of one well over a short period of time. The model was designed to simulate the effects of withdrawal of water from a well field for periods of a year or longer.

The model was not designed to predict subsidence accurately; although, the simulation of clay compaction was included. Declines in the altitudes of the potentiometric surfaces are simulated, and these values can be used in calculations to predict subsidence.

Caution should be used in applying the modeled values in equations to predict short-term specific capacity of an individual well. The model simulates leaky-aquifer conditions with clay storage for time intervals greater than 1 year.

Data Required for Improvement of the Model

Observation wells that are screened in only one water-bearing unit are needed for better calibration of the model. The areas where measurements from such observation wells are needed are determined easily by noting the areas in which no potentiometric measurements are shown on Figures 12 and 15.

The accuracy of the model could be improved by better delineation of the water-bearing sands above the basal sand (Alta Loma Sand of Rose, 1943) of the lower unit of the Chicot in the Texas City area. To improve the correlation of observed and measured declines in the altitude of the potentiometric surface in the Texas City area, it was necessary to program extra pumpage.

More data are needed on the quantity of ground water pumped for irrigation in the vicinity of Dayton and Liberty and on the quantity of water discharged from flowing and pumped wells prior to 1930 in Galveston County.

The model could be modified to simulate clay compaction more accurately if the storage coefficient for clay compaction is determined accurately for each aquifer. In the present model, the storage coefficient for clay compaction is modeled as existing entirely between the land surface and the centerline of the lower unit of the Chicot aquifer and the Chicot aquifer undifferentiated. To distribute the storage coefficient accurately, more data concerning the characteristics of these clay layers are needed. These data can be obtained from consolidation tests on core samples, records of clay compaction from compaction recorders, and possibly from studies of various types of geophysical logs.

The present model could be modified to be one of the elements of a hybrid analog-digital model that could be used for detailed studies of such problems as salt-water encroachment and land-surface subsidence.

SUMMARY

The Houston district has two major aquifers above the Burkeville confining layer. The uppermost aquifer is the Chicot aquifer, which consists of sand and clay layers that dip gently toward the Gulf of Mexico. In places in the Houston district, the Chicot aquifer can be separated into an upper and a lower unit.

The upper unit, which is not an important source of water for most of the district, can be defined where the altitude of the potentiometric surface differs from the altitude of the potentiometric surface in the lower unit. Where the upper unit cannot be defined, the aquifer is said to be undifferentiated.

The Evangeline aquifer, which is the major aquifer in the district, underlies the Chicot aquifer and consists of sand and clay layers that dip toward the Gulf of Mexico.

The Burkeville confining layer consists mostly of clay layers that form an effective barrier to ground-water flow at nearly all locations except at and near the outcrop of the Evangeline aquifer in Montgomery County.

The large cones of depression in the potentiometric surfaces in the lower unit of the Chicot aquifer, the Chicot aquifer undifferentiated, and the Evangeline aquifer are caused by large withdrawals of water. Water now flows toward the center of these cones, creating a reversal of the original hydraulic gradient in most areas south of Houston. This reversal of the hydraulic gradient has resulted in salt-water encroachment toward the centers of the cones, but

REF 04

TEXAS DEPARTMENT OF WATER RESOURCES

REPORT 236

STRATIGRAPHIC AND HYDROGEOLOGIC FRAMEWORK OF PART OF THE COASTAL PLAIN OF TEXAS

By

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United States Geological Survey

This report was prepared by the U.S. Geological Survey under cooperative agreement with the Texas Department of Water Resources.

July 1979

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STRATIGRAPHIC AND HYDROGEOLOGIC FRAMEWORK OF PART OF THE COASTAL PLAIN OF TEXAS

INTRODUCTION

This report has been prepared to illustrate the stratigraphic and hydrogeologic framework of a part of the Coastal Plain of Texas from the Sabine River to the Rio Grande. It is the outgrowth of a project that has as its ultimate objective the construction of a digital ground-water flow model, if feasible or desirable, of at least a part of the Miocene aquifers in the Gulf Coastal Plain of Texas. The model would serve as a tool for planning the development of the ground-water supplies. Work on the project is being done by the U.S. Geological Survey in cooperation with the Texas Department of Water Resources.

During the course of delineating the Miocene aquifers, which is basic to the design and development of the model, the scope of the study was broadened to include delineations of other hydrogeologic units, as well as delineations of stratigraphic units. As a result, units ranging in age from Paleocene to Holocene were delineated (Table 1). A relationship of stratigraphic units to designated hydrogeologic units was thus established statewide.

Eleven dip sections and 1 strike section are included in this report. The dip sections are spaced about 50 miles (80 km) apart with the most easterly one being near the Sabine River and the most southerly one being near the Rio Grande. Each dip section is about 100 miles (161 km) long and extends from near the coastline to short distances inland from the outcrop of the oldest Miocene formation—the Catahoula Tuff or Sandstone. The strike section, which is about 500 miles (804 km) long (in three segments), extends from the Sabine River to the Rio Grande and joins the dip sections at common control points. This section is from 50-75 miles (80-121 km) inland from the Gulf of Mexico and is essentially parallel to the coastline. The location of the sections and the Catahoula outcrop are shown on Figure 1.

The sections extend from outcrops at the land surface to maximum depths of 7,600 feet (2,316 m) below sea level. Selected faunal occurrences, where known or inferred by correlation from nearby well logs, are included. The extent of sand that contains water having less than 3,000 mg/l (milligrams per liter) of dissolved solids was estimated from the electrical characteristics shown by the logs. This information is included on all of the sections.

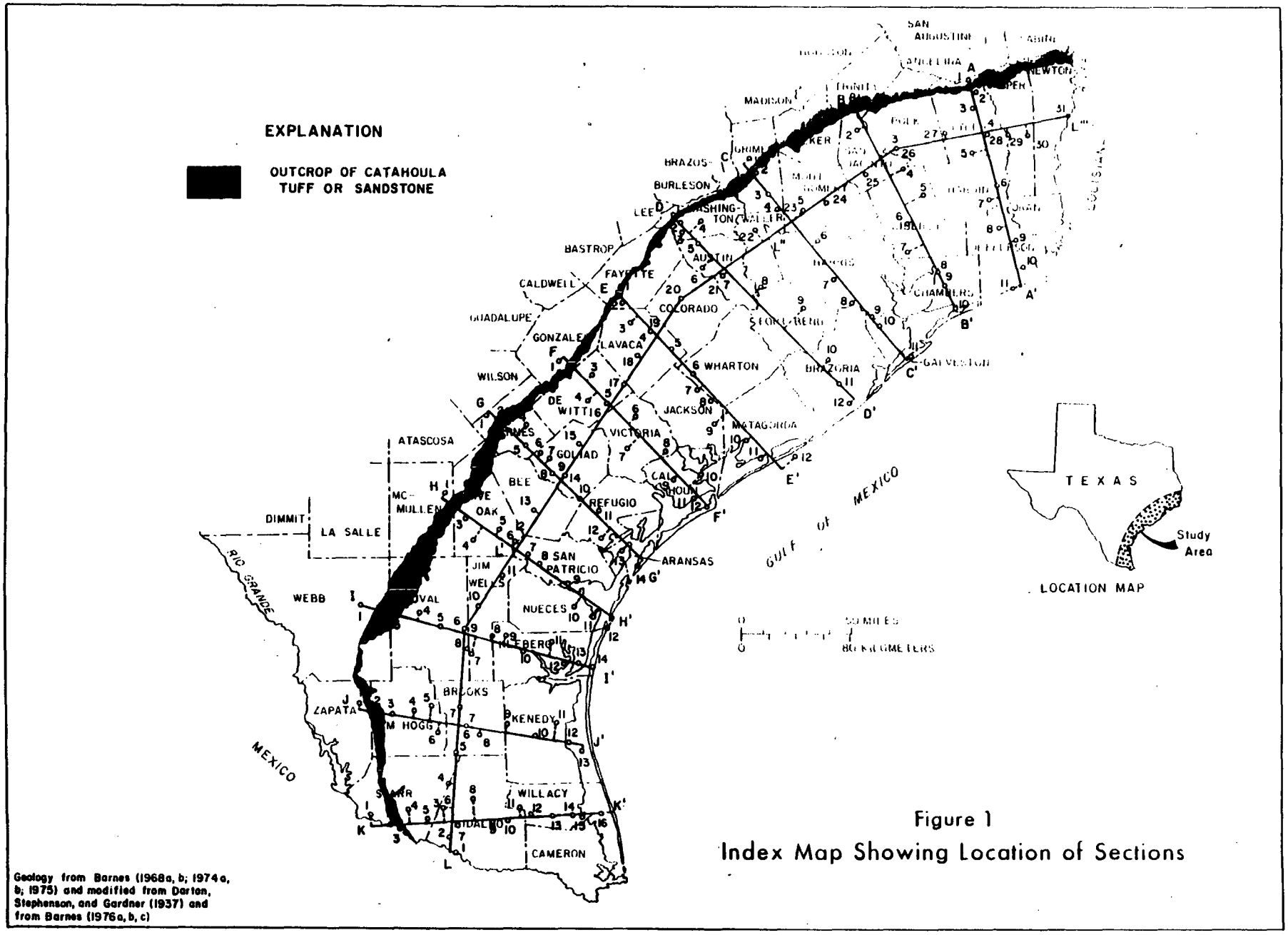
Although faulting is common in the Coastal Plain and is complex in some areas, all faults have been omitted from the sections to maintain continuity of the stratigraphic and hydrogeologic boundaries. The disadvantage of such omission is, of course, the representation of an unrealistic and simplistic picture of unbroken strata with uninterrupted boundaries. In reality, many of the faults have not only broken the hydraulic continuity of the strata but more importantly have become barriers to fluid flow or conduits for cross-formational flow. The sections are presented in this report as Figures 2-15.

Acknowledgements

The author wishes to express his appreciation to C. W. Holcomb (Exxon Co., USA), C. B. Phillips (Mobil Oil Corp.), and G. C. Hardin, Jr. (Ashland Exploration Co.) of Houston, Texas; J. G. Klatt (Mobil Oil Corp.) and J. C. Wyeth (Continental Oil Co.) of Corpus Christi, Texas; H. C. Hixson (Mobil Oil Corp.) of Denver, Colorado; and D. C. Bebout (Bureau of Economic Geology, University of Texas at Austin), for discussing correlation problems. Their assistance does not necessarily constitute an endorsement of the views expressed by the author in this report. The assistance of V. E. Barnes (Bureau of Economic Geology, University of Texas at Austin), who provided unpublished geologic maps of South Texas areas; of R. H. Wallace, Jr., J. B. Wesselman, and R. E. Taylor (U.S. Geological Survey) of Bay St. Lewis, Mississippi; of P. H. Jones (Department of Geology, Louisiana State University), Baton Rouge, Louisiana, who provided log data, is also appreciated. D. G. Jorgensen (U.S. Geological Survey) of Lawrence, Kansas (formerly of Houston, Texas) and W. R. Meyer

Table 1.--Stratigraphic and Hydrogeologic Framework of Part of the Coastal Plain of Texas

Era	System	Series	Stratigraphic Units	Hydrogeologic Units	Selected Faunal Markers	Remarks
CENOZOIC	Quaternary	Holocene	Alluvium	Chicot aquifer		Quaternary System undifferentiated on sections.
		Pleistocene	Beaumont Clay			
			Montgomery Formation			
			Bentley Formation			
			Willis Sand			
	Tertiary	Pliocene	Goliad Sand	Evangeline aquifer		Goliad Sand overlapped east of Lavaca County.
		Miocene	Fleming Formation	Burkeville confining system	*Potamides matsoni* *Bigenerina nodosaria* var. *directa* *Bigenerina humblei* *Amphistegina* sp.	
			Oakville Sandstone	Jasper aquifer		Oakville Sandstone included in Fleming Formation east of Washington County.
			Surface: Catahoula Tuff or Sandstone; Subsurface: Upper part of Catahoula Tuff or Sandstone	Catahoula confining system (restricted)	*Discorbis nomada* *Discorbis gravelli* *Heterostegina* sp. *Marginulina idiomorpha*	Catahoula Tuff designated as Catahoula Sandstone east of Lavaca County.
			Subsurface: Anahuac Formation		*Textularia mississippiensis*	Anahuac and "Frio" Formations may be Oligocene in age.
			Subsurface: "Frio" Formation			
		Oligocene(?)	Surface: Frio Clay; Subsurface: Vicksburg Group equivalent	Not discussed as hydrologic units in this report.	*Textularia warreni*	Frio Clay overlapped or not recognized on surface east of Live Oak County.
		Eocene	Jackson Group: Whitsett Formation: Fashing Clay Member			Indicated members of Whitsett Formation apply to south-central Texas. Whitsett Formation east of Karnes County may be, in part or in whole, Oligocene in age.
			Jackson Group: Whitsett Formation: Calliham Sandstone Member or Tordilla Sandstone Member			
			Jackson Group: Whitsett Formation: Dubose Member		*Marginulina cocoaensis*	
			Jackson Group: Whitsett Formation: Deweesville Sandstone Member			
			Jackson Group: Whitsett Formation: Conquista Clay Member		*Textularia hockleyensis*	
			Jackson Group: Whitsett Formation: Dilworth Sandstone Member		*Massilina pratti*	
			Jackson Group: Manning Clay			
			Jackson Group: Wellborn Sandstone		*Textularia dibollensis*	
			Jackson Group: Caddell Formation			
			Claiborne Group: Yegua Formation		*Nonionella cockfieldensis*	
			Claiborne Group: Cook Mountain Formation		*Discorbis yeguaensis*	
			Claiborne Group: Sparta Sand		*Eponides yeguaensis*	
			Claiborne Group: Weches Formation		*Ceratobulimina eximia*	
			Claiborne Group: Queen City Sand			
			Claiborne Group: Reklaw Formation			
			Claiborne Group: Carrizo Sand			
		Paleocene	Wilcox Group			
			Midway Group			



Geology from Barnes (1968a, b; 1974a, b; 1975) and modified from Darton, Stephenson, and Gardner (1937) and from Barnes (1976a, b, c)

Figure 1
Index Map Showing Location of Sections

subsurface correlations of the Catahoula-Fleming contact, as well as formation thicknesses, will continue to differ.

Burkeville Confining System

The Burkeville confining system, which was named by Wesselman (1967) for outcrops near the town of Burkeville in Newton County, Texas, is delineated on the sections from the Sabine River to near the Rio Grande. It separates the Jasper and Evangeline aquifers and serves to retard the interchange of water between the two aquifers.

The Burkeville has been mapped in this report as a rock-stratigraphic unit consisting predominantly of silt and clay. Boundaries were determined independently from time concepts although in some places the unit appears to possess approximately isochronous boundaries. In most places, however, this is not the case. For example, the entire thickness of sediment in the Burkeville confining system in some areas is younger than the entire thickness of sediment in the Burkeville in other places.

The configuration of the unit is highly irregular. Boundaries are not restricted to a single stratigraphic unit but transgress the Fleming-Oakville contact in many places. This is shown on sections D-D' to G-G' and J-J' (Figures 5-8 and 11). Where the Oakville Sandstone is present, the Burkeville crops out in the Fleming but dips gradually into the Oakville because of facies changes from sand to clay downdip.

The typical thickness of the Burkeville ranges from about 300 to 500 feet (91 to 152 m). However, thick sections of predominantly clay in Jackson and Calhoun Counties account for the Burkeville's gradual increase to its maximum thickness of more than 2,000 feet (610 m) as shown on section F-F' (Figure 7).

The Burkeville confining system should not be construed as a rock unit that is composed entirely of silt and clay. This is not typical of the unit, although examples of a predominance of silt and clay can be seen in some logs in sections H-H' and I-I' (Figures 9-10). In most places, the Burkeville is composed of many individual sand layers, which contain fresh to slightly saline water; but because of its relatively large percentage of silt and clay when compared to the underlying Jasper aquifer and overlying Evangeline, the Burkeville functions as a confining unit.

Evangeline Aquifer

The Evangeline aquifer, which was named and defined by Jones (Jones, Turcan, and Skibitzke, 1954) for a ground-water reservoir in southwestern Louisiana, has been mapped also in Texas, but heretofore has been delineated no farther west than Washington, Austin, Fort Bend, and Brazoria Counties. Its presence as an aquifer and its hydrologic boundaries to the west have been a matter of speculation. D. G. Jorgensen, W. R. Meyer, and W. H. Sandeen of the U.S. Geological Survey (written commun., March 1, 1976) recently refined the delineation of the aquifer in previously mapped areas and continued its delineation to the Rio Grande. The boundaries of the Evangeline as they appear on the sections in this report are their determinations.

The Evangeline aquifer has been delineated in this report essentially as a rock-stratigraphic unit. Although the aquifer is composed of at least the Goliad Sand, the lower boundary transgresses time lines to include sections of sand in the Fleming Formation. The base of the Goliad Sand at the outcrop coincides with the base of the Evangeline only in South Texas as shown in sections H-H' to K-K' (Figures 9-12). Elsewhere, the Evangeline at the surface includes about half of the Fleming outcrop. The upper boundary of the Evangeline probably follows closely the top of the Goliad Sand where present, although this relationship is somewhat speculative.

The Evangeline aquifer is typically wedge shaped and has a high sand-clay ratio. Individual sand beds are characteristically tens of feet thick. Near the outcrop, the aquifer ranges in thickness from 400 to 1,000 feet (122 to 305 m), but near the coastline, where the top of the aquifer is about 1,000 feet (305 m) deep, its thickness averages about 2,000 feet (610 m). The Evangeline is noted for its abundance of good quality ground water and is considered one of the most prolific aquifers in the Texas Coastal Plain. Fresh to slightly saline water in the aquifer, however, is shown to extend to the coastline only in section J-J' (Figure 11).

Chicot Aquifer

The Chicot aquifer, which was named and defined by Jones (Jones, Turcan, and Skibitzke, 1954) for a ground-water reservoir in southwestern Louisiana, is the youngest aquifer in the Coastal Plain of Texas. Over the years, the aquifer gradually was mapped westward from Louisiana into Texas where, heretofore, its most

westerly mapped limit was Austin, Fort Bend, and Brazoria Counties. In this report, the delineation of the Chicot was refined in previously mapped areas and extended to near the Rio Grande by D. G. Jorgensen, W. R. Meyer, and W. M. Sandeen of the U.S. Geological Survey (written commun., March 1, 1976).

It is believed that the base of the Chicot in some areas has been delineated on the sections in this report as the base of the Pleistocene. Early work in Southeast Texas indicates that the Chicot probably comprises the Willis Sand, Bentley Formation, Montgomery Formation, and Beaumont Clay of Pleistocene age and any overlying Holocene alluvium (Table 1). The problem that arises in this regard is that the base of the Pleistocene is difficult to pick from electrical logs. Thus any delineation of the base of the Chicot in the subsurface as the base of the Pleistocene is automatically suspect. At the surface, the base of the Chicot on the sections has been picked at the most landward edge of the oldest undissected coastwise terrace of Quaternary age. In practice, the delineation of the Chicot in the subsurface, at least on the sections in Southeast Texas, has been based on the presence of a higher sand-clay ratio in the Chicot than in the underlying Evangeline. In some places, a prominent clay layer was used as the boundary. Differences in hydraulic conductivity or water levels in some areas also served to differentiate the Chicot from the Evangeline.

The high percentage of sand in the Chicot in Southeast Texas, where the aquifer is noted for its abundance of water, diminishes southwestward. Southwest of section G-G' (Figure 8) the higher clay content of the Chicot and the absence of fresh to slightly saline water in the unit is sharply contrasted with the underlying Evangeline aquifer that still retains relatively large amounts of sand and good quality water.

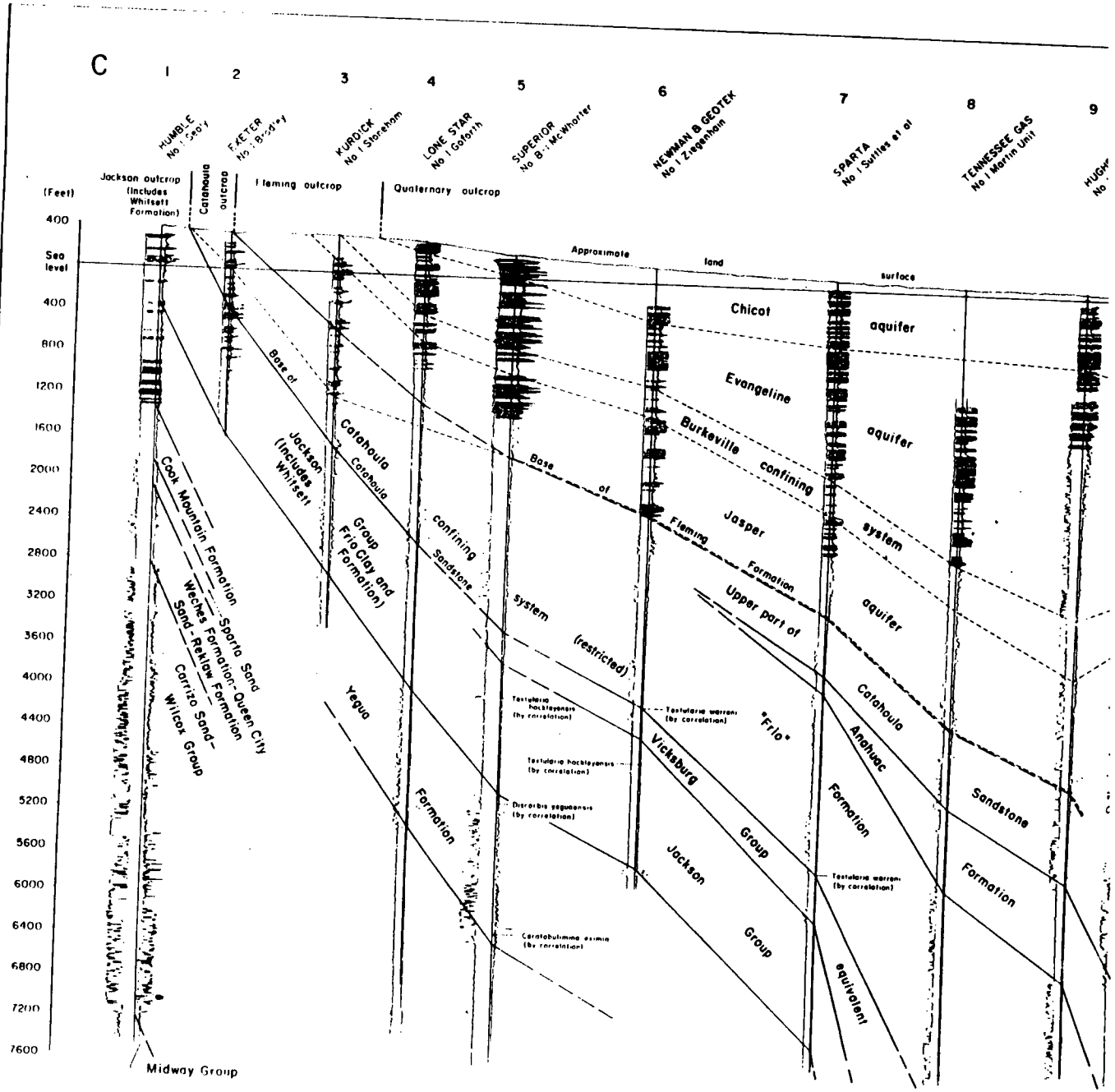


Figure 4
Stratigraphic and Hydrogeologic Section C

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International Specialists in the Environment

REF 05

CERCLIS#: TXD006806582

SITE ASSESSMENT REPORT

For

Palmer Warehouse
Houston, Harris County, Texas

Prepared for

EPA - REGION VI
EMERGENCY RESPONSE BRANCH

J. Chris Petersen
Deputy Project Officer

By

Ecology and Environment, Inc.
Technical Assistance Team

August 19, 1988

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ecology and environment, inc.
6440 HILLCROFT AVENUE, HOUSTON, TEXAS 77081, TEL. 713/771-9460
International Specialists in the Environment

CERCLIS#: TXD006806582

DATE: August 19, 1988

TO: Pat Hammack, OSC
EPA Region VI, Emergency Response Branch

THRU: J. Chris Petersen, Deputy Project Officer
EPA Region VI, Emergency Response Branch

THRU: Kishor Fruitwala, TATL
Region VI, Technical Assistance Team

FROM: Holly L. Gray
Region VI, Technical Assistance Team

SUBJECT: Site Assessment
Palmer Warehouse
Houston, Harris County, Texas

TDD#: T06-8805-09
PAN#: TTX 0697 SAA

On May 18, 1988, TAT members Gray, Yeager and Wisnieski met with OSC Pat Hammack to conduct a site assessment at Palmer Warehouse located at 1040 Lockwood, Houston, Texas. The assessment was conducted to inventory and inspect the deteriorating condition of abandoned drums and photographic/printing supplies stored for SCI Equipment and Technology (SCI), a company which is now defunct.

Palmer Warehouse is an active facility located about 3 miles east-northeast of downtown Houston. Although other commercial businesses and light industry operate in the nearby vicinity, the area to the northeast and northwest of the warehouse is primarily residential. Three public parks and one hospital lie within a one mile radius of the facility.

The Palmer Warehouse Company, along with its subsidiary, Palmer-Pack Co., Inc. operates five warehouses. The Palmer Warehouse operates as a full distribution warehouse storing a variety of commodities for various clients. Palmer-Pack Co., Inc. is involved in the packaging of polypropylene and polyethylene products, some of which have been stored in the same warehouse as the SCI abandoned chemicals and photographic/printing material.

The 1040 Lockwood warehouse is situated on a 5.145 acre tract of land and is leased to Palmer under the designation of Lockwood "B" by Trammell Crow, a Houston management company for Houston-St. Louis Properties, Limited.

Houston-St. Louis is a Texas limited partnership composed of George A. Shutt, general partner, and New England Life Insurance Company, a Massachusetts corporation limited partnership (See Special Warranty Deed information).

SCI and its associated companies, owned by Jack and Charles Colbert, were involved in the purchase of off specification and waste chemicals for export. SCI materials were stored in warehouses and frequently abandoned. According to Palmer, 63 drums and 39 skids or 51,955 pounds of photographic and printing supplies are associated with SCI shipments. The Colbert brothers have been indicted on various counts of fraud and are serving sentences in a federal prison.

As a result of an investigation into the illegal activities conducted by companies run by the Colbert brothers, the EPA Houston RCRA inspectors and the Texas Water Commission conducted an inspection of the Palmer Warehouse on January 29, 1988. On February 10, 1988, a site inspection was made by the EPA Emergency Response Branch. A recommendation was made to Palmer to contact an environmental consulting firm and solicit aid in the cleanup of leaking material stored in the warehouse.

On May 18, 1988, TAT and OSC Hammack met with Howard McGlone at Palmer Warehouse. OSC Hammack explained the purpose of the inspection and the possibility of a federal removal action of the abandoned SCI drums and Anchor/Lithkemko photographic and printing material. TAT reviewed Palmer's SCI file data and obtained copies of pertinent documents and available Material Safety Data Sheets for Anchor/Lithkemko products.

TAT visually inspected the storage area at the east end of the 1040 Lockwood warehouse where SCI drums and photographic material were stored. The drums were stored on skids in several locations between Palmer's polypropylene product. The photographic and printing material was stacked on pallets along the northwest and north walls (see Site Sketch). Palmer employees were active in repacking some of the leaking photographic material. Asphaltum Gum Etch Finisher had been poured into nine metal drums. Repacking of Red Combo Developer ceased when OSC Hammack suggested that repacking of any leaking material be accomplished by placing the leaking cases themselves into overpack drums rather than repouring contents into a drum.

TAT performed air monitoring with the organic vapor analyzer (OVA), O_2/explosimeter, radiation alert monitor (RAM) IV, and HCN and H_2S monitoxes in level C. An OVA reading of 3 units equivalent benzene above background was recorded from one of the large, plastic-lined cardboard boxes into which discarded containers had been placed during the repackaging of leaking product. Greater than 10 units equivalent benzene was recorded from an area where product had leaked onto the concrete floor along the northwest wall (see Site Sketch). No other readings were recorded.

TAT inventoried and inspected the condition of the 63 drums reportedly stored for SCI. The drums were numbered with spray paint except for nine drums, identified as #53 through #61, located in a narrow aisle between Palmer product which were inaccessible (see Photos, page 4 of 11). Of the 63-drum total, there were 19 drums of acetaldehyde, 5 drums of formaldehyde, 14 drums of alpha methyl styrene, 13 drums of non-hazardous Aerosol A268 product, and 12 drums of unidentified chemical content. One of these drums is purported to contain a weed killer and another drum an adhesive. TAT Attachment #1, SCI Drum Inventory, lists the content, if known, along with the condition of each drum. Of the 38 drums containing acetaldehyde, formaldehyde and alpha methyl styrene, 25 are rusting, 4 are dented and 3 show signs of bulging. All three of these chemicals are toxic and each of the chemicals is either flammable, explosive or combustible (see TAT Attachment #3, Inventory Summary with Hazardous Constituents). In addition formaldehyde is a carcinogen. The 12 drums of unknown chemical content present unknown hazards.

TAT then inventoried and inspected the condition of Anchor/Lithkemko photographic/printing products stored for SCI. The material was packaged in cases, drums and pails. A complete listing, as inventoried, is shown on TAT Attachment #2. Many of the products contained hazardous constituents. Inventoried material that was damaged and leaking contained constituents such as chrome alum, phosphoric acid, ammonium bichromate, ammonium hydroxide and butyl cellosolve. One bulged drum is known to contain a combustible material with constituents such as hexane, methylene chloride and isopropyl alcohol.

Attachment #3 is a combined summary of the 63 drum SCI inventory and the Anchor/ Lithkemko product inventory and includes associated chemical hazards and/or hazardous chemical constituents. Threshhold limit values (TLV's) for various chemicals or product constituents included in the SCI inventory are shown on TAT Attachment #5. Acetaldehyde, formaldehyde and alpha methyl styrene have TLV's of 100 ppm, 1 ppm, and 50 ppm respectively. Leaking and damaged photographic/printing material contained constituents as noted above which carry TLV's ranging from 0.05 mg/m^3 for ammonium bichromate to 400 ppm for isopropyl alcohol.

TAT also reviewed Palmer's SCI file and compiled Attachment #5, SCI Inventory Documentation, which lists all available documentation for SCI stored materials.

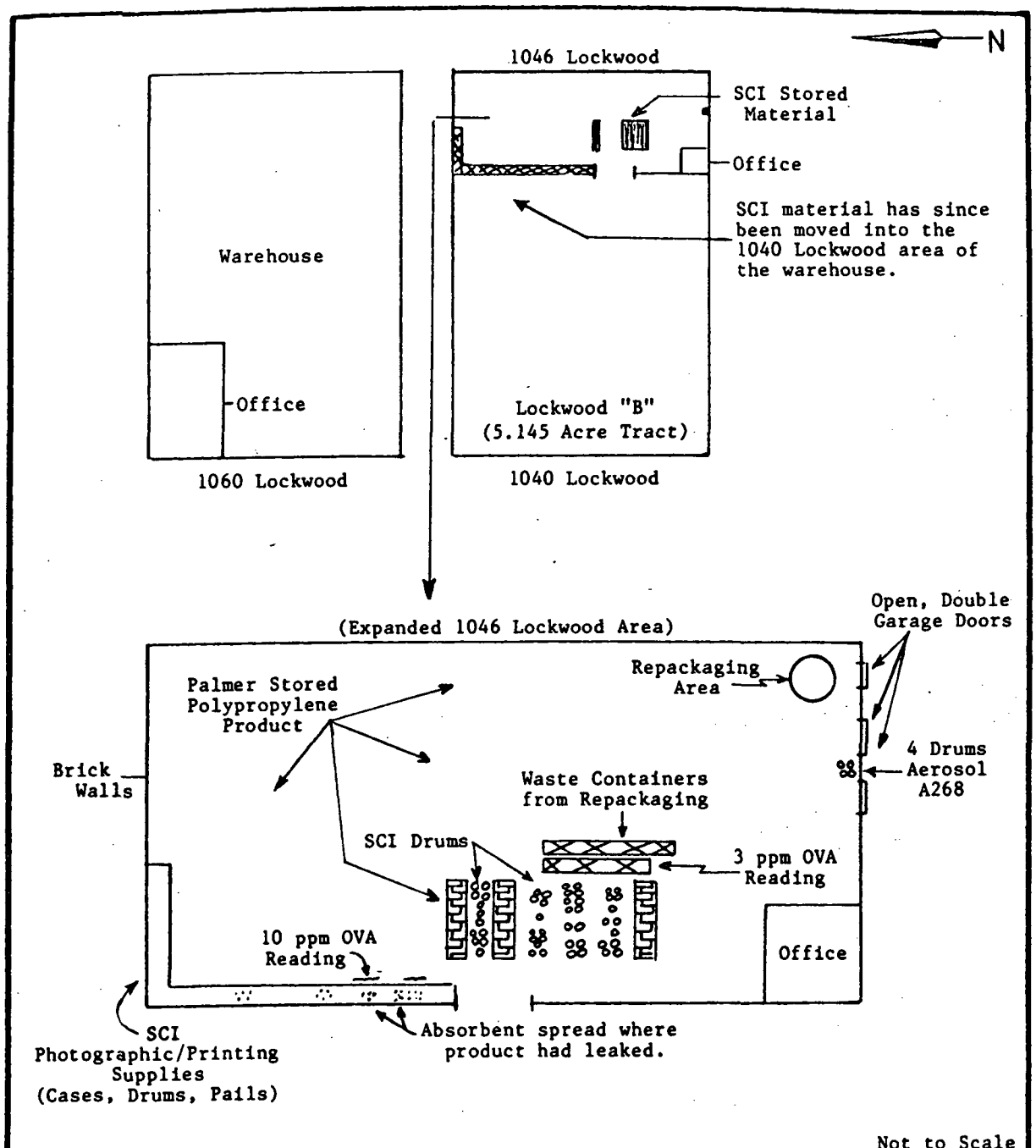
The site assessment identified a threat to human health due to the deteriorating condition of drums containing hazardous chemicals and leaking product containers storing hazardous constituents. Many of the materials present uncontrolled exposure routes that include direct contact, ingestion, and inhalation. Workers are exposed to potentially toxic, flammable, explosive, and carcinogenic materials. In addition, the threat of fire or explosion poses a hazard to the surrounding population which is primarily residential to the northeast and northwest of the site.

On May 31, 1988, TAT prepared a Draft Action Memorandum, TAT Attachment #6, per OSC Hammack's request. On June 10, 1988, OSC Pat Hammack met with representatives of Palmer Warehouse and Houston-St. Louis Properties at which time it was decided that the PRP would pursue removal action. An Action Memorandum was subsequently generated by Pat Hammack on June 22, 1988 and an Administrative Order issued. Palmer Warehouse is currently considering options for disposition of SCI abandoned materials.

Attachments:

Topographic Quadrangle Map
Site Sketch
Houston Street Map
Photographs (Mounted)
Unused Photographs and Negatives
Logbook Copies
Site Safety Plan for OSC Site Visit
Correspondence
Deed Search Information (Special Warranty Deed)
Newspaper Article (Re: Colbert Brothers)
Palmer Photo Supply Inventory (5-31-88)
Palmer Consignment Agreement (6-20-88)
TAT Attachments:
- #1 SCI Drum Inventory (5-18-88)
- #2 SCI Inventory Photographic/Printing Materials (5-18-88)
- #3 Summary SCI Material Inventoried (with Chemical Constituents)
- #4 Threshhold Limit Values (TLV's) for SCI Chemical Constituents
- #5 SCI Inventory Documentation
- #6 Draft Action Memorandum

Action Memorandum (6-20-88)
Copy of TDD#: T06-8805-09A



	Ecology and Environment, Inc. Technical Assistance Team RegionVI	CERCLIS#: TXD006806582	TDD No: T06-8805-09
		PAN: TTX 0697 SAA	Date: July 21, 1988
		Originator: Holly L. Gray	

Site Sketch

PALMER WAREHOUSE

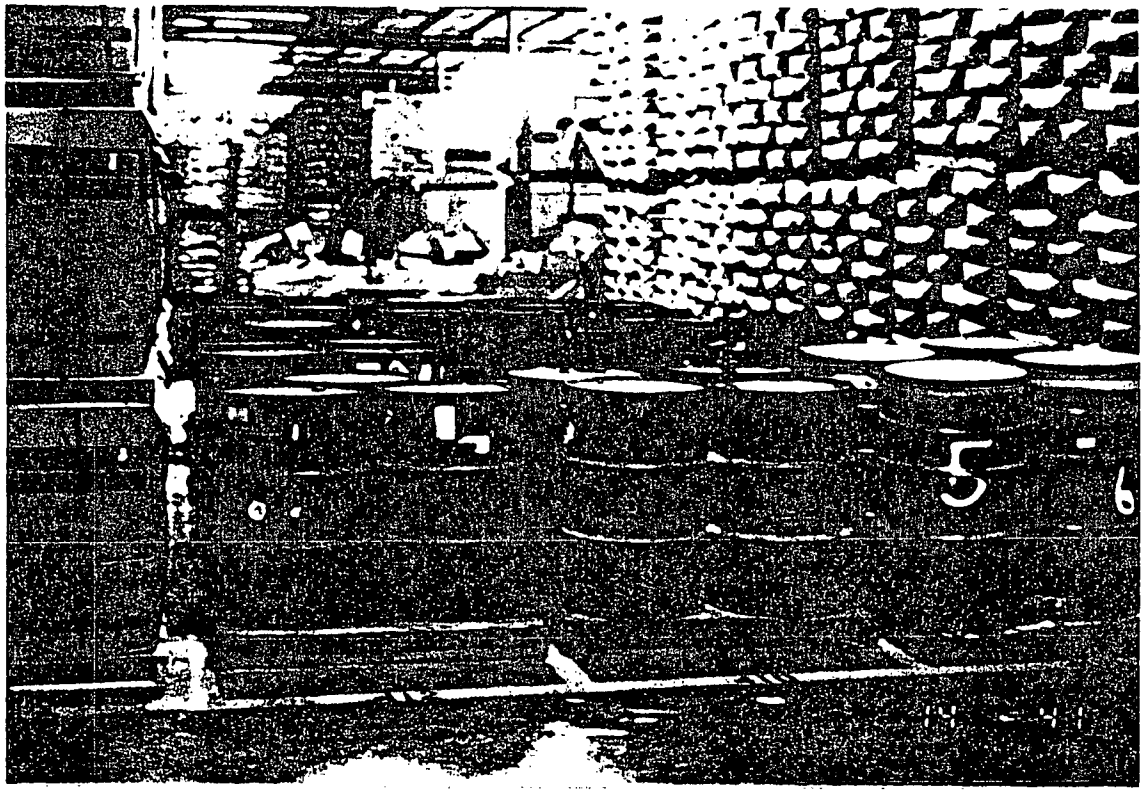
HOUSTON, HARRIS COUNTY, TEXAS

	Ecology and Environment, Inc. Technical Assistance Team RegionVI	Cerclis# TXD 006806582	TDD No: T06-8805-09
		PAN: TTX 0697 SAA	Date: 6-22-88
		Originator: Holly L. Gray	

PALMER WAREHOUSE

HOUSTON STREET MAP
HARRIS COUNTY, TEXAS

0 Scale 1
Miles



TDD#: T06-8805-09 Pg. 1 of 10

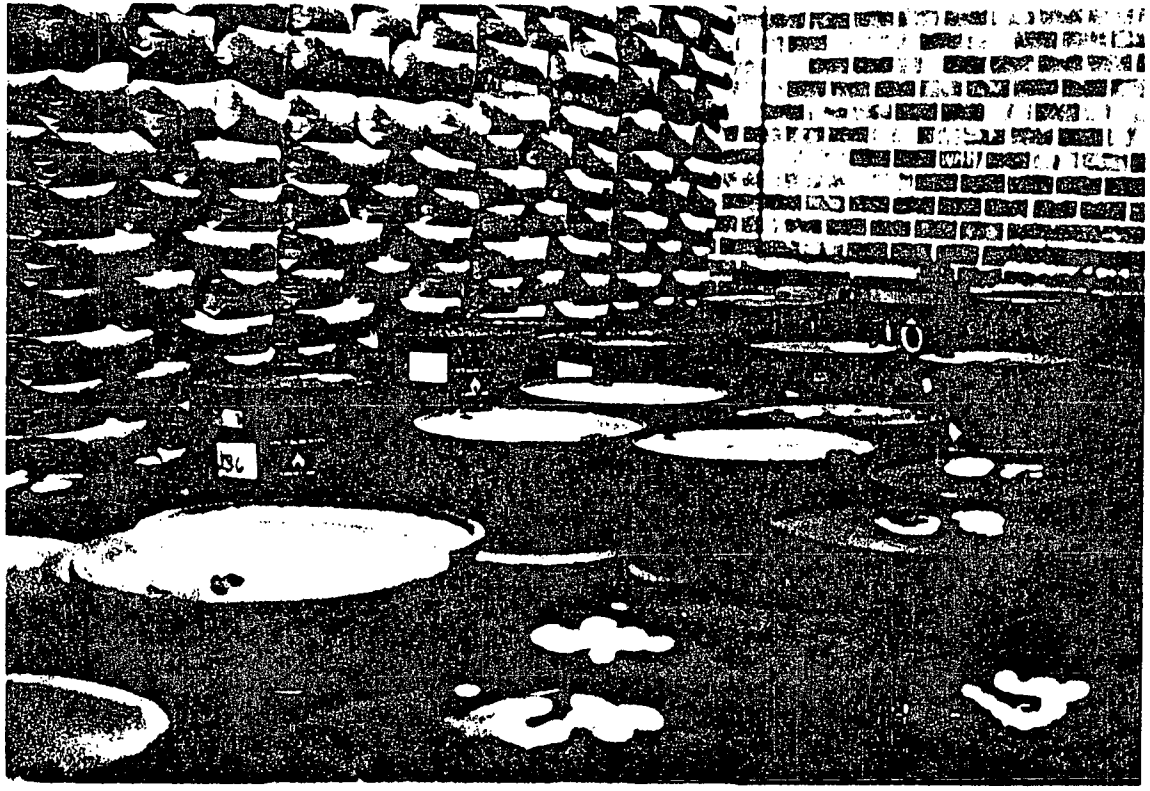
PHOTOGRAPHER/WITNESS # 2

R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88/1441/E

COMMENTS: Main group of the 63 drums stored for SCI between rows of Palmer Warehouse polypropylene product.



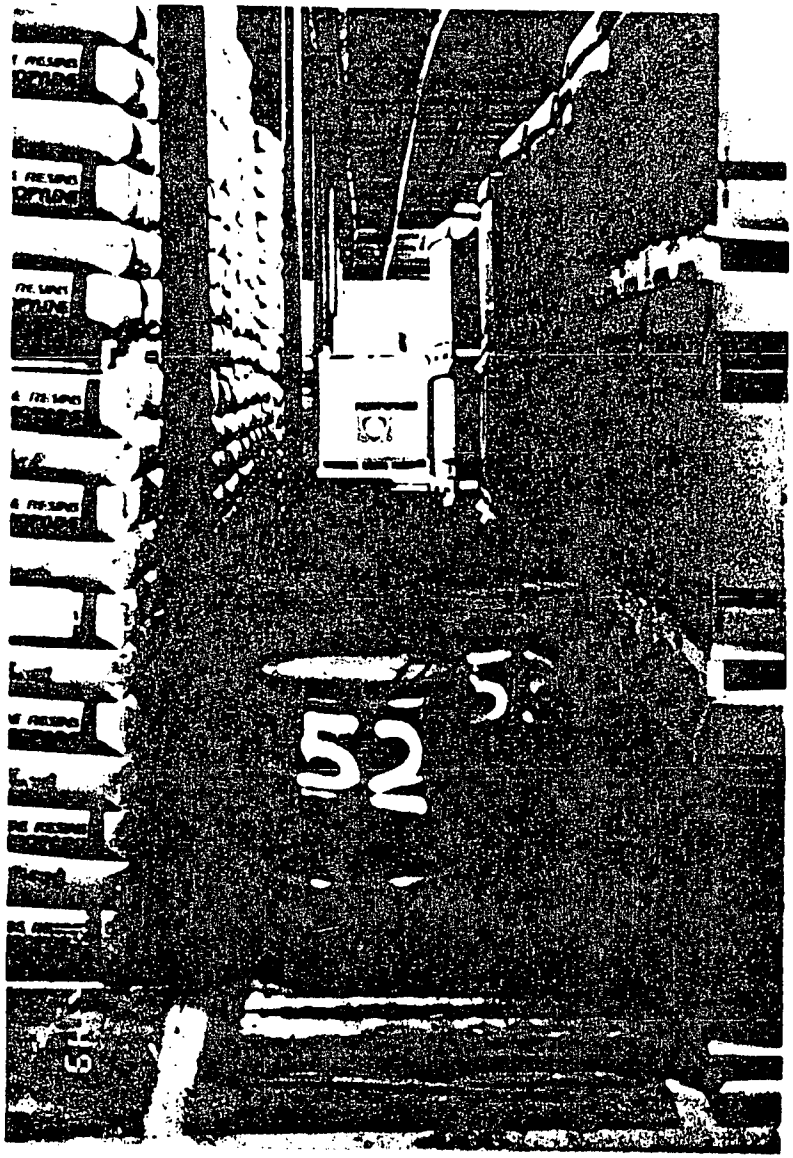
PHOTOGRAPHER/WITNESS # 5

R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88/1446/W

COMMENTS: Note dented, rusting condition of the drums. 38 drums contain acetaldehyde, formaldehyde and alpha methyl styrene.



TDD#: T06-8805-09 Pg. 2 of 10

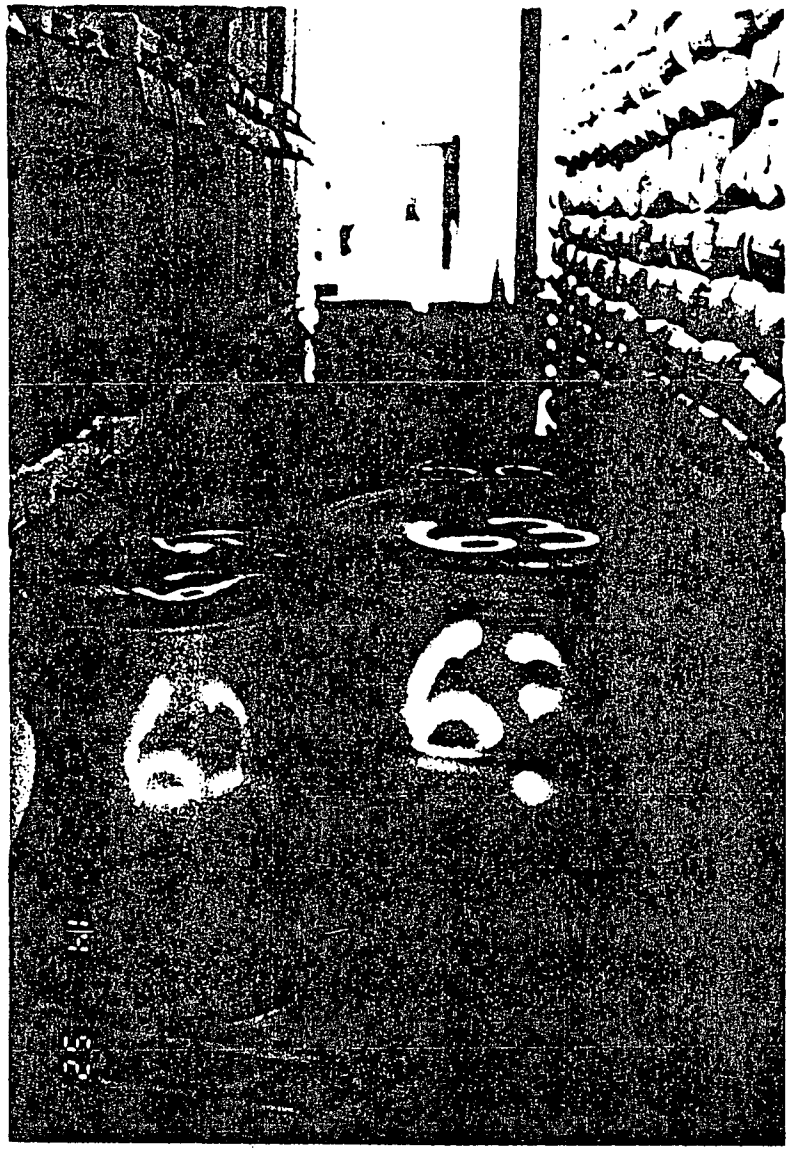
PHOTOGRAPHER/WITNESS # 7

R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88//1449/E

COMMENTS: Row of 12 drums set apart from the main group of SCI drums. 12 of 63 drums contain unknown chemicals; 8 are located in the row shown.



TDD#: T06-8805-09 Pg. 3 of 10

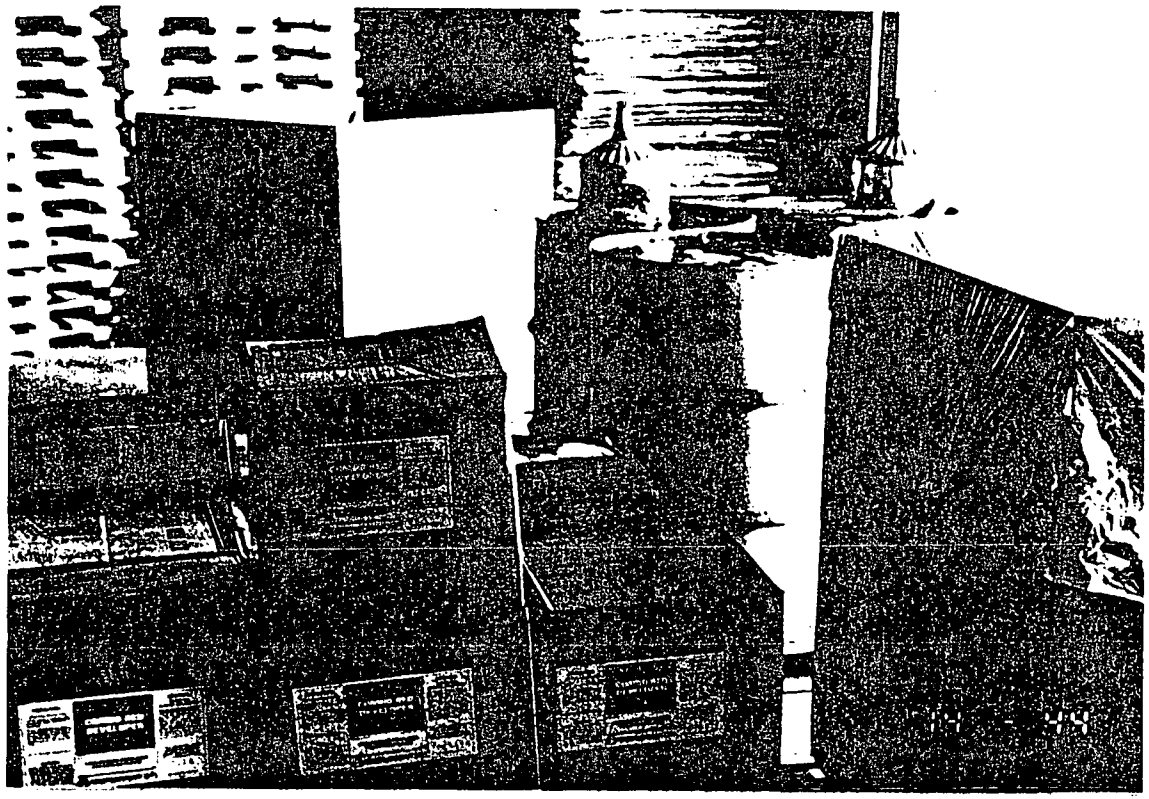
PHOTOGRAPHER/WITNESS # 8

R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88/1452/W

COMMENTS: Four salvage drums and 2 Diamond Shamrock fiber drums of unknown content. Note staining at top of the fiber drum.



TDD#: T06-8805-09 Pg. 4 of 10

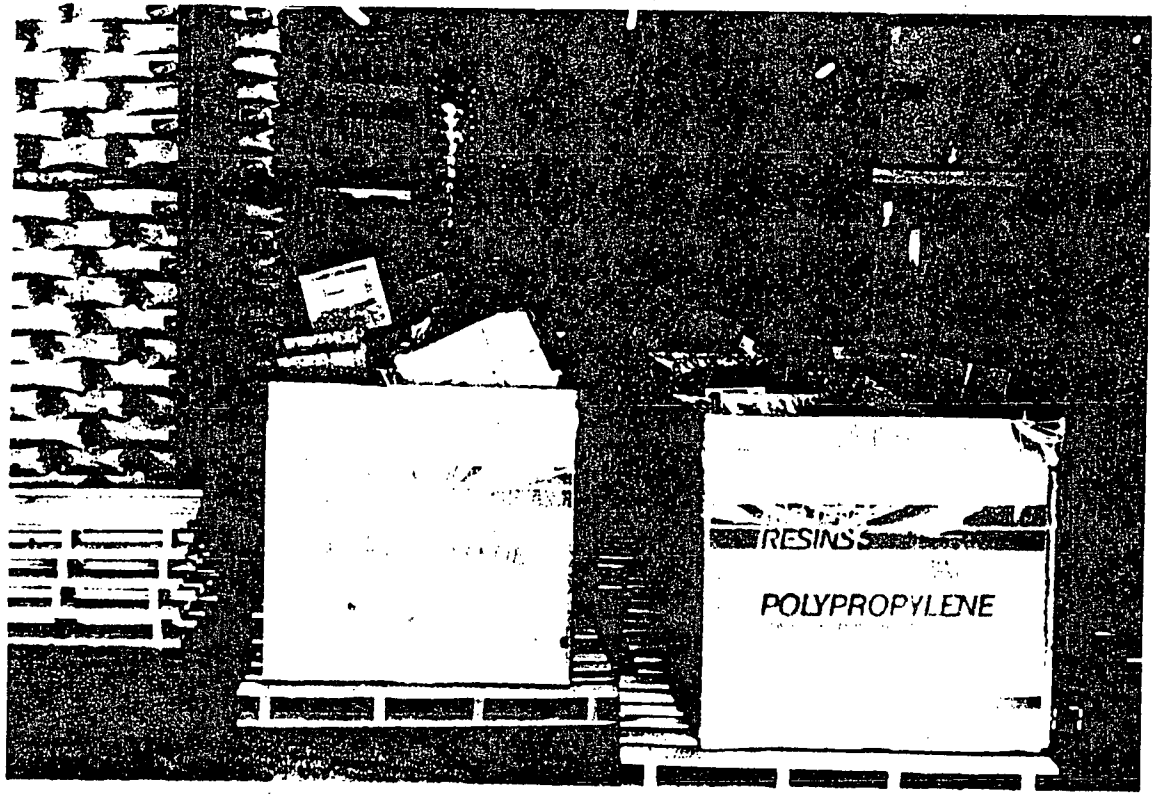
PHOTOGRAPHER/WITNESS # 4

R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88/1444/E

COMMENTS: Repackaging of leaking photo supplies (Combo Red Developer) in progress.



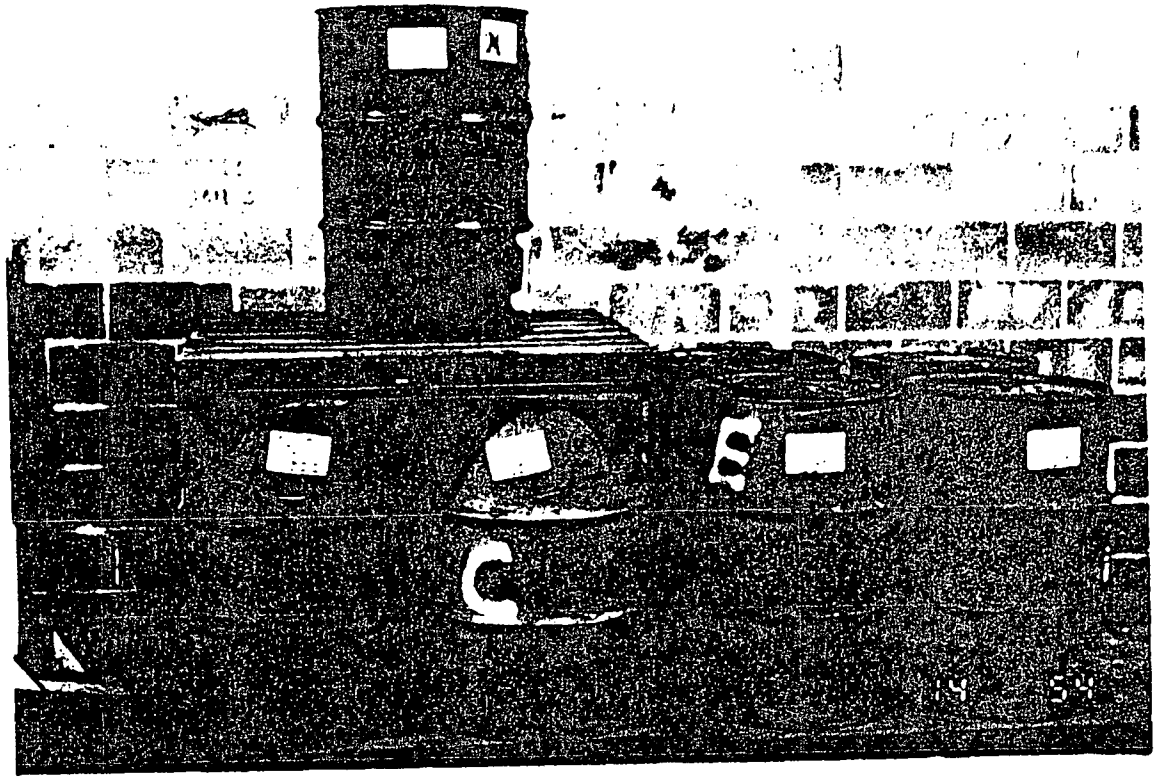
PHOTOGRAPHER/WITNESS # 6

R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88/1447/N

COMMENTS: Empty containers placed in lined boxes along aisle perpendicular to stored drummed chemicals. (Note photo #2, pg. 1)



TDD#: T06-8805-09 Pg. 5 of 10

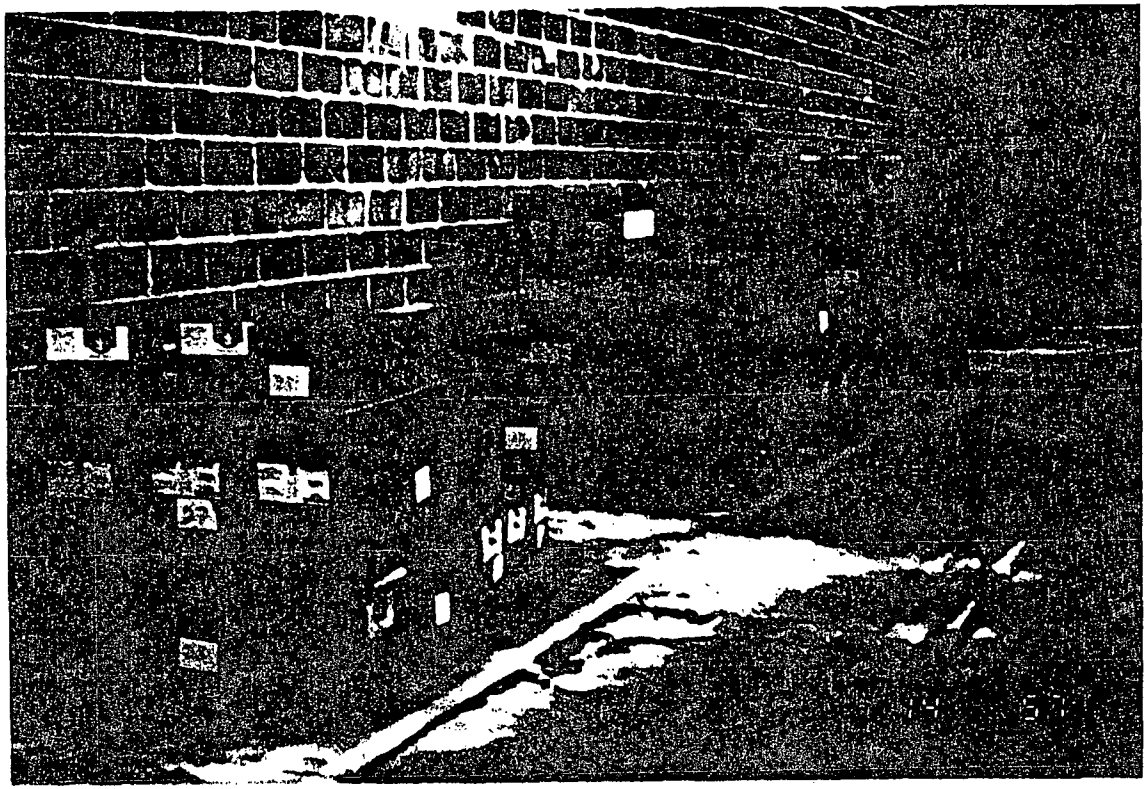
PHOTOGRAPHER/WITNESS # 9

R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88/1454/W

COMMENTS: Nine drums of repackaged Asphaltum Gum Etch Finisher along the NW wall.



PHOTOGRAPHER/WITNESS # 10

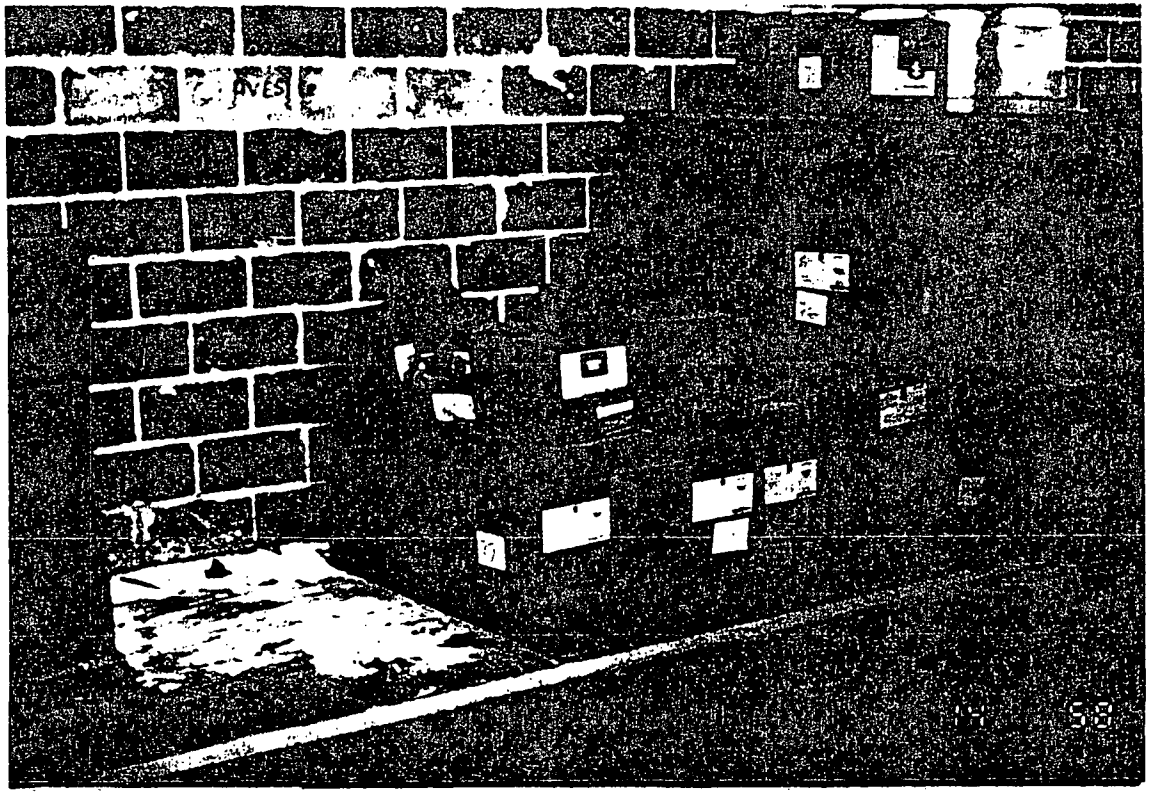
R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88/1457/NW

COMMENTS: Pan view along NW wall. Absorbent compound spread in areas of leaking product. Greater than 10 ppm OVA reading from foreground leak area.

11



TDD#: T06-8805-09 Pg. 6 of 10

PHOTOGRAPHER/WITNESS #11

R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88/1458/NW

COMMENTS: Leaking Ultra Kem packaged product along the NW wall.

PHOTOGRAPHER/WITNESS #12

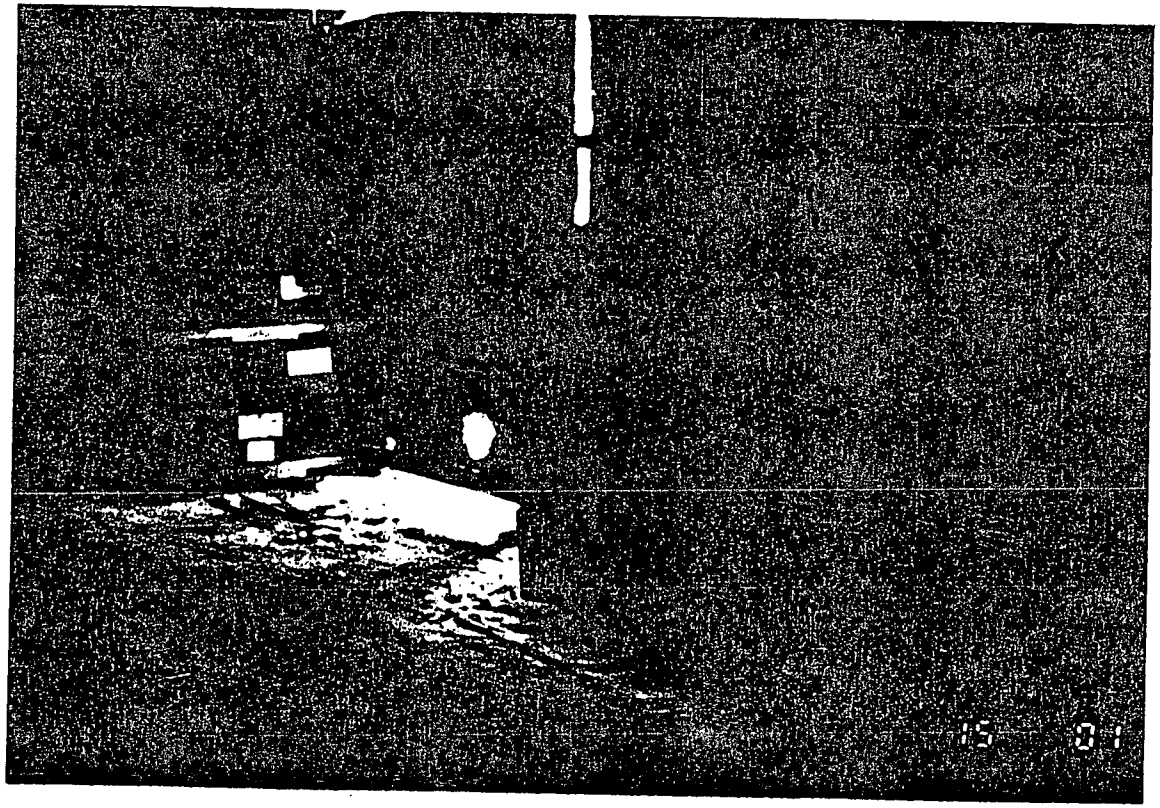
R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88/1500 NW

COMMENTS: View of NW corner of stored SCI photographic/printing supplies.

21



TDD#: T06-8805-09 **Pg.** 7 **of** 10

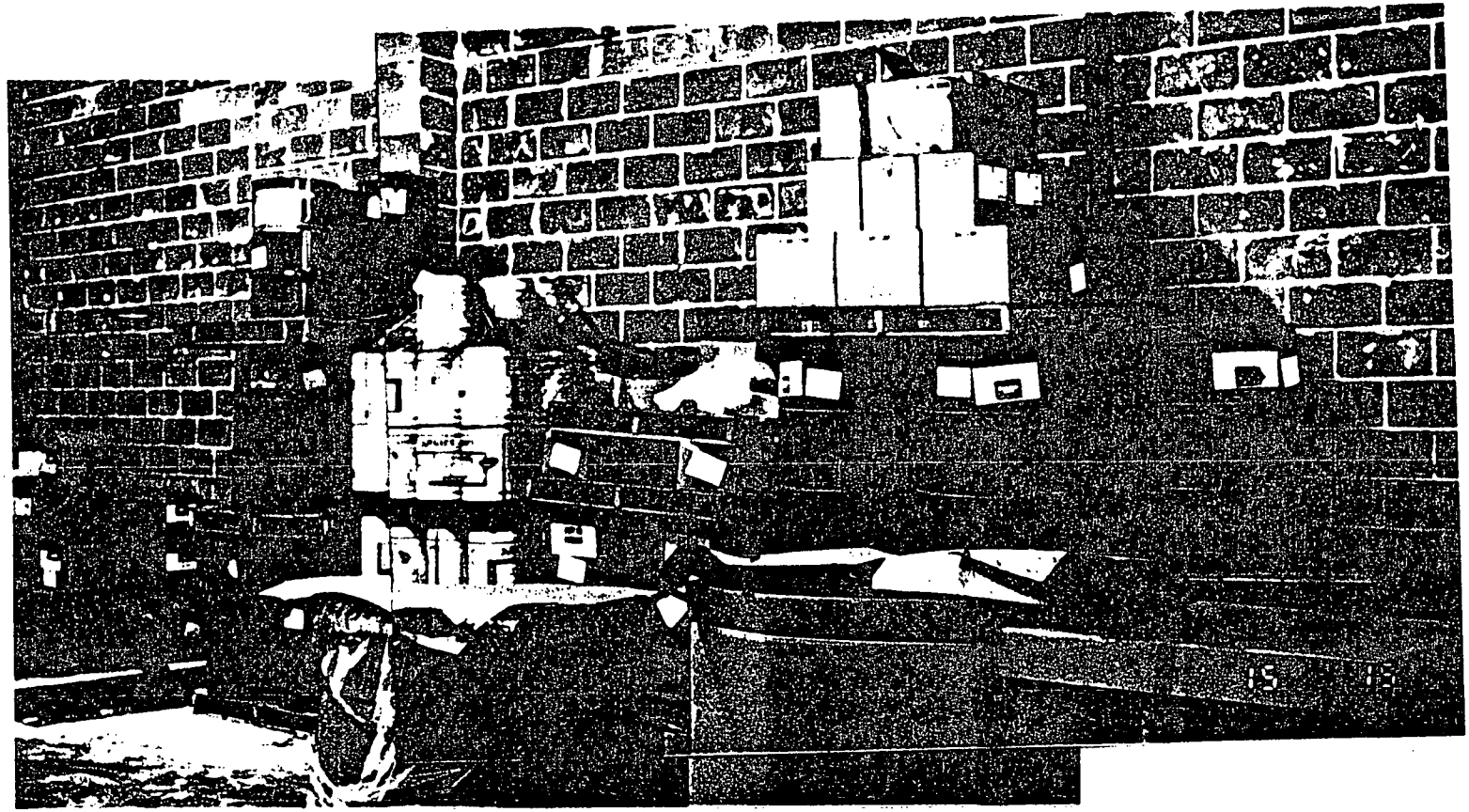
PHOTOGRAPHER/WITNESS # 13

R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88/1501/NW

COMMENTS: Lithkemko photographic/printing products stored along the N wall.



TDD#: T06-8805-09 Pg. 8 of 10

PHOTOGRAPHER/WITNESS # 14-15

R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88/1514-151 /NW

COMMENTS: Continuation of products stored along the north wall. View from preceeding photo is in an easterly direction.

14

TDD#: T06-8805-09 Pg. 9 of 10

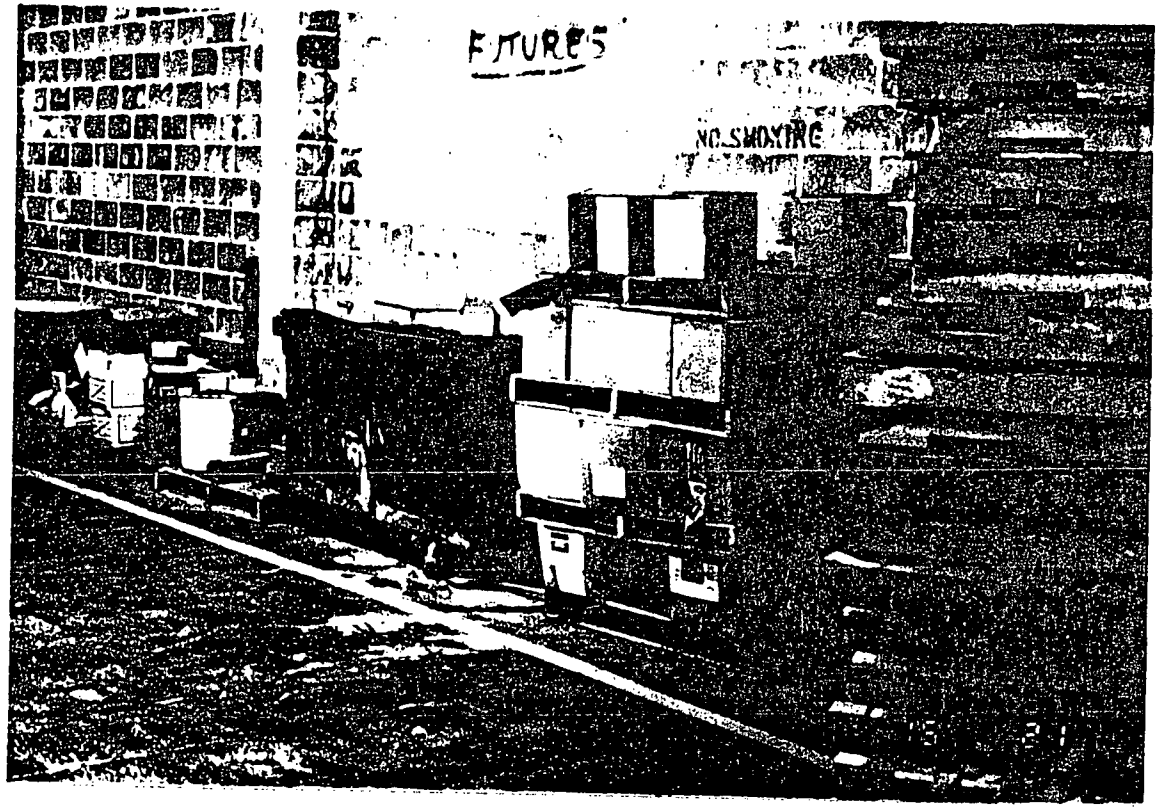
PHOTOGRAPHER/WITNESS # 16

R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88/1519/W

COMMENTS: Drummed products along the N wall. The metal drum is bulged and one poly drum is inverted and leaking.



TDD#: T06-8805-09 Pg. 10 of 10

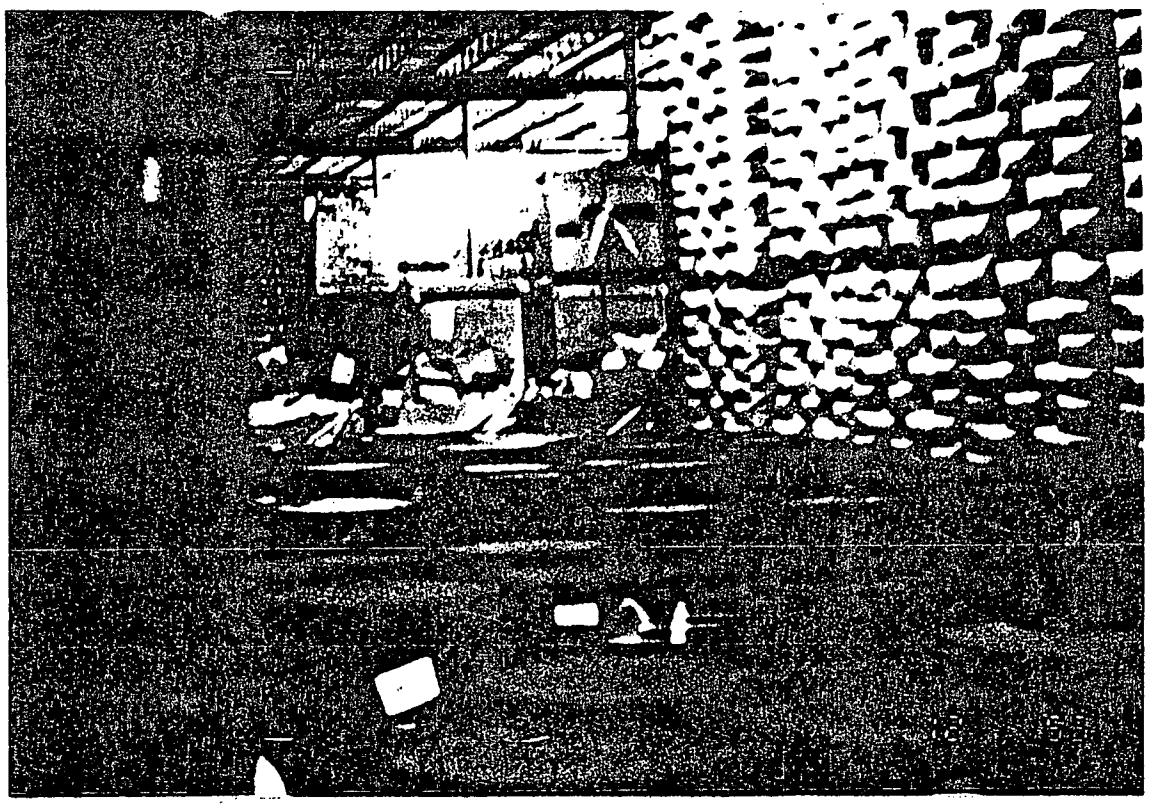
PHOTOGRAPHER/WITNESS # 17

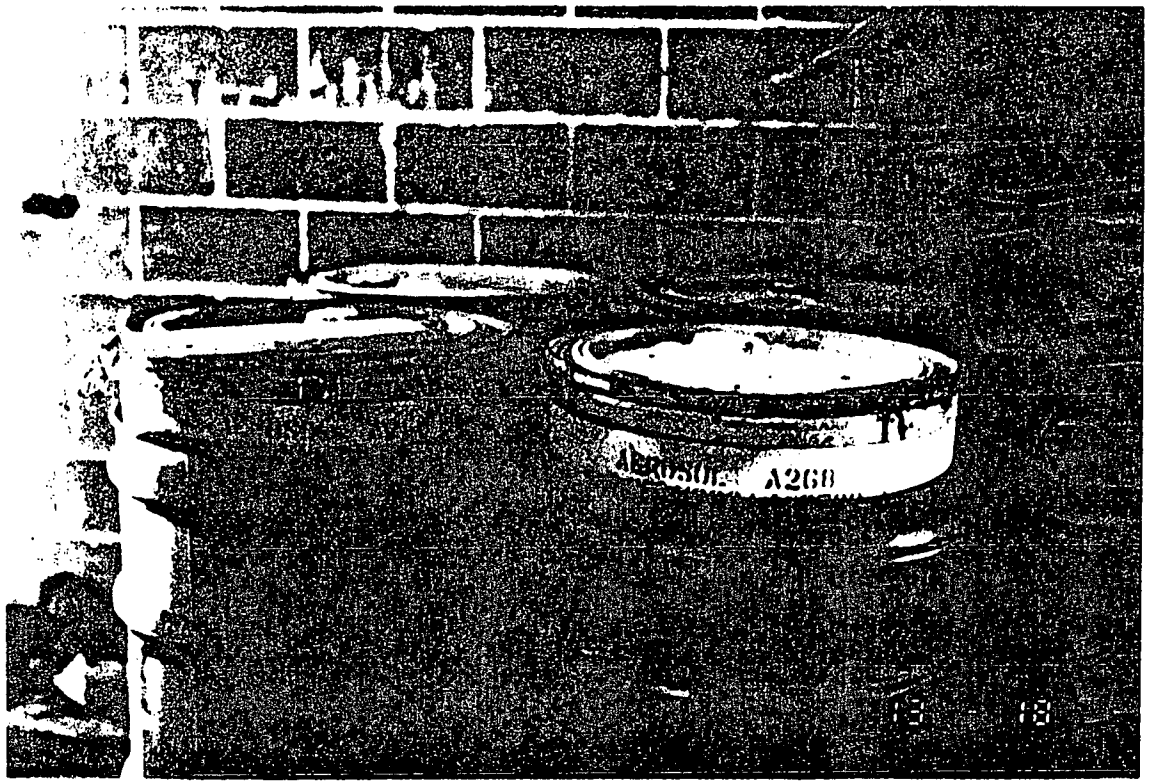
R. Yeager/H. Gray

DATE/TIME/DIRECTION

5-18-88/1521/W

COMMENTS: One skid of product stored along the east-central area of the N wall.





TDD#: T06-8805-09 Pg. 1 of 11

PHOTOGRAPHER/WITNESS #11,23

EPA OSC Hammack

DATE/TIME/DIRECTION

5-18-88/1253, 1318 SE,S

COMMENTS: Drums abandoned by SCI at the Palmer Warehouse. The overpacked Aersol A-268 product is non-hazardous.

TDD#: T06-8805-09 Pg. 2 of 11

PHOTOGRAPHER/WITNESS # 3

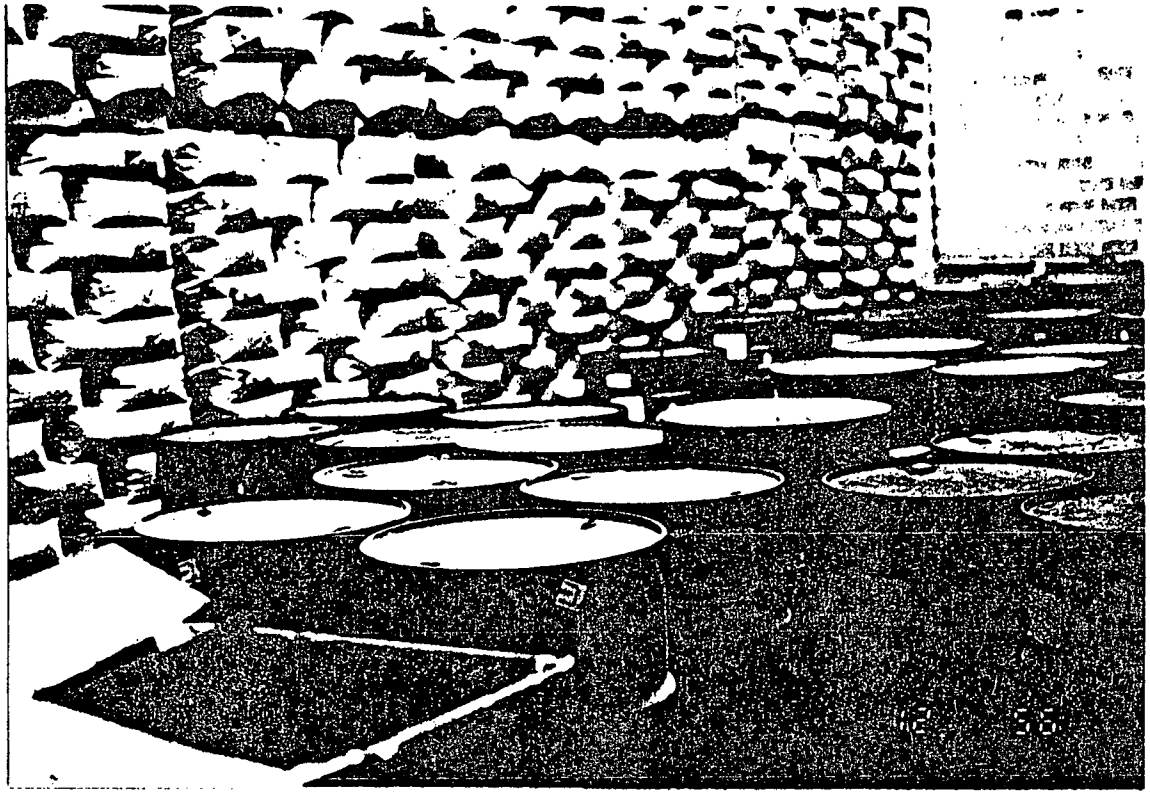
EPA OSC Hammack

DATE/TIME/DIRECTION

5-18-88/1249/E

COMMENTS: East view main group of drums.

Note dented and rusting drum condition.



TDD#: T06-8805-09 Pg. 3 of 11

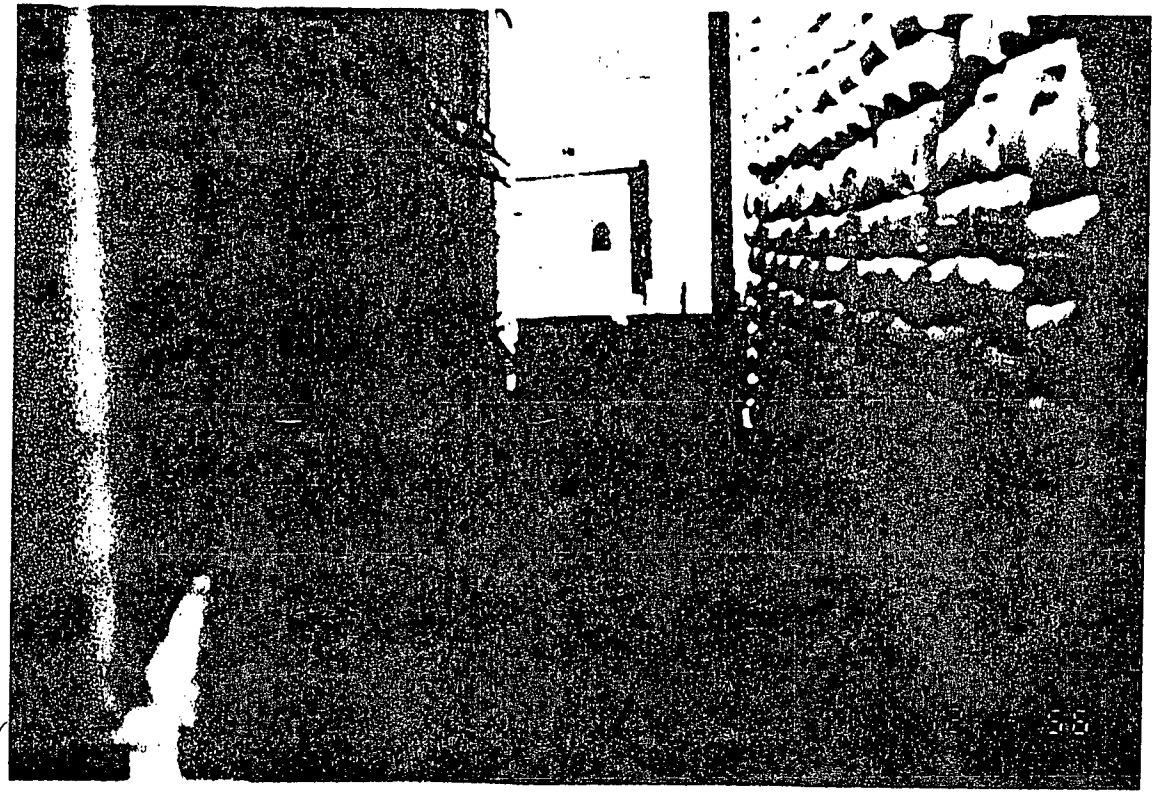
PHOTOGRAPHER/WITNESS #14,4

EPA OSC Hammack

DATE/TIME/DIRECTION

5-18-88/1256,1250/WSW

COMMENTS: WSW view of main group of SCI drums. Note rusting acetaldehyde drum.



TDD#: T06-8805-09 Pg. 4 of 11

PHOTOGRAPHER/WITNESS #10.15

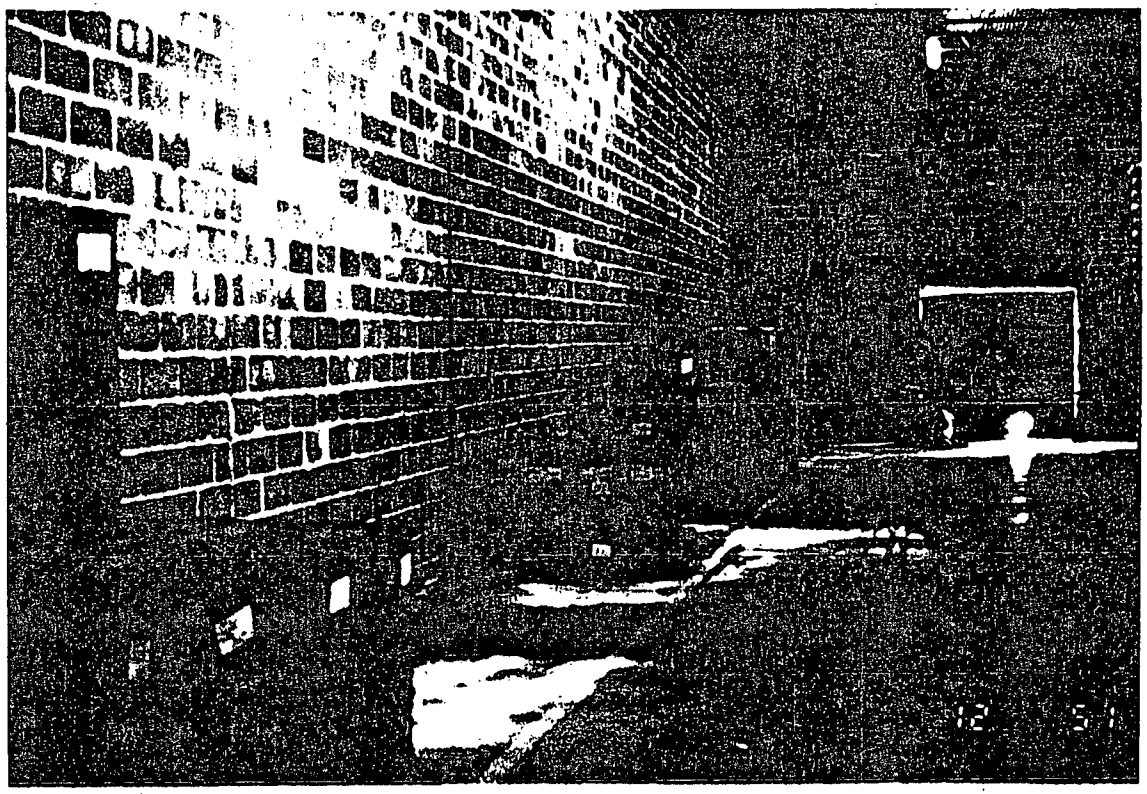
EPA OSC Hammack

DATE/TIME/DIRECTION

5-18-88/1253, 1256/E,W

COMMENTS: 8 of the 12 drums stored in the aisle between Palmer polypropylene product contain unknown chemicals.

20



TDD#: T06-8805-09 Pg. 5 of 11

PHOTOGRAPHER/WITNESS # 5,6

EPA OSC Hammack

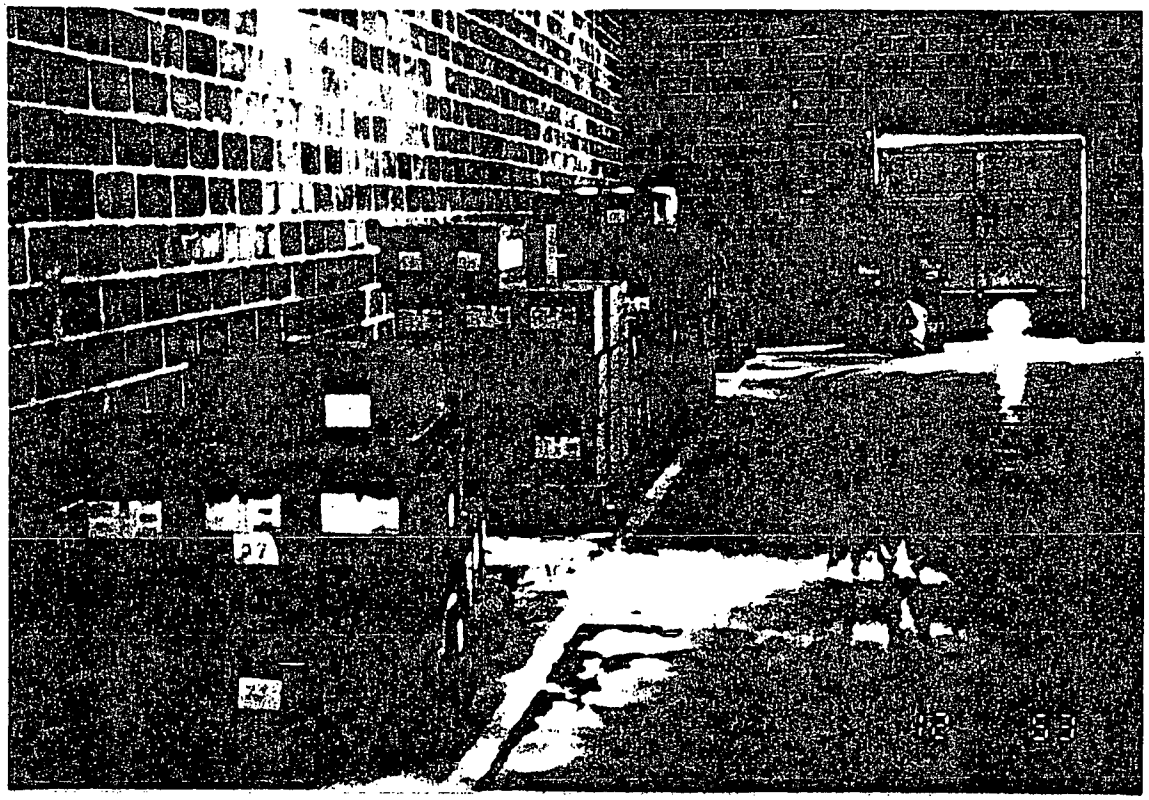
DATE/TIME/DIRECTION

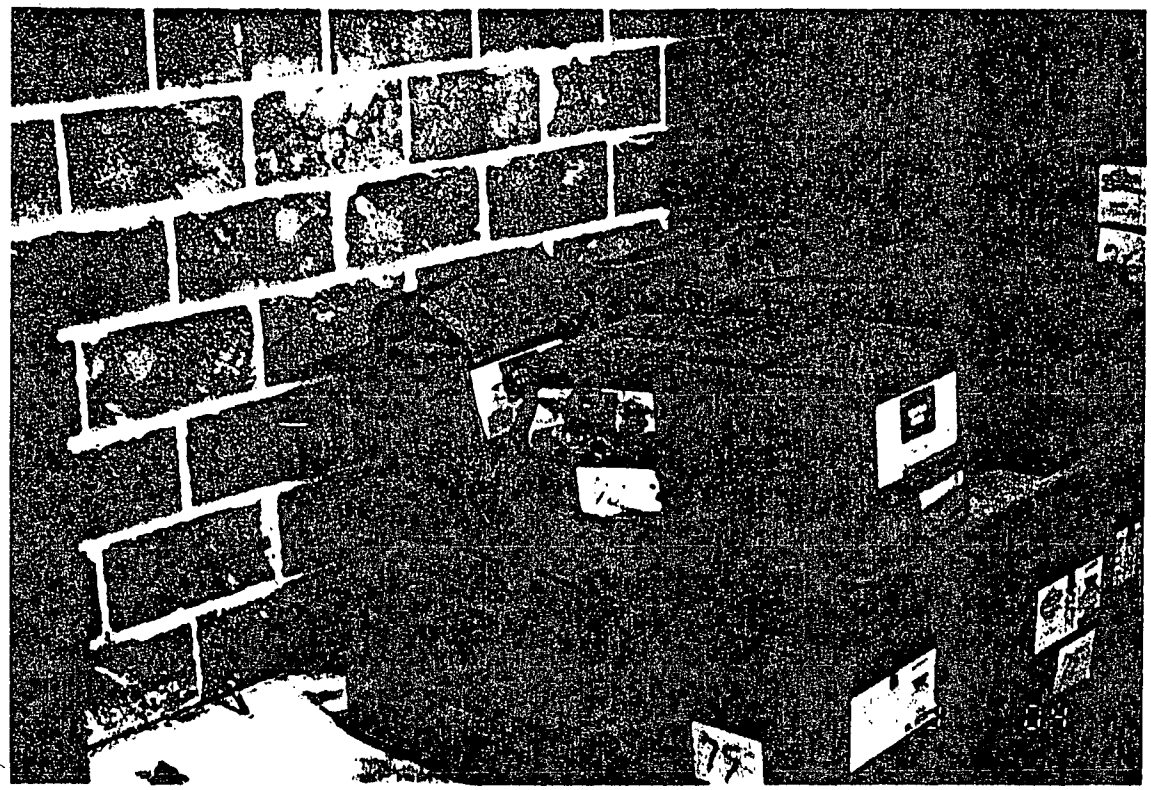
5-18-88/1251/NW, NNW

COMMENTS: Lithkemko photograhic supplies abandoned by SCI. Asphaltum Gum Etch Finisher was repackaged by Palmer.

Note absorbent spread where product had leaked.

12





TDD#: T06-8805-09 Pg. 6 of 11

PHOTOGRAPHER/WITNESS #9,17

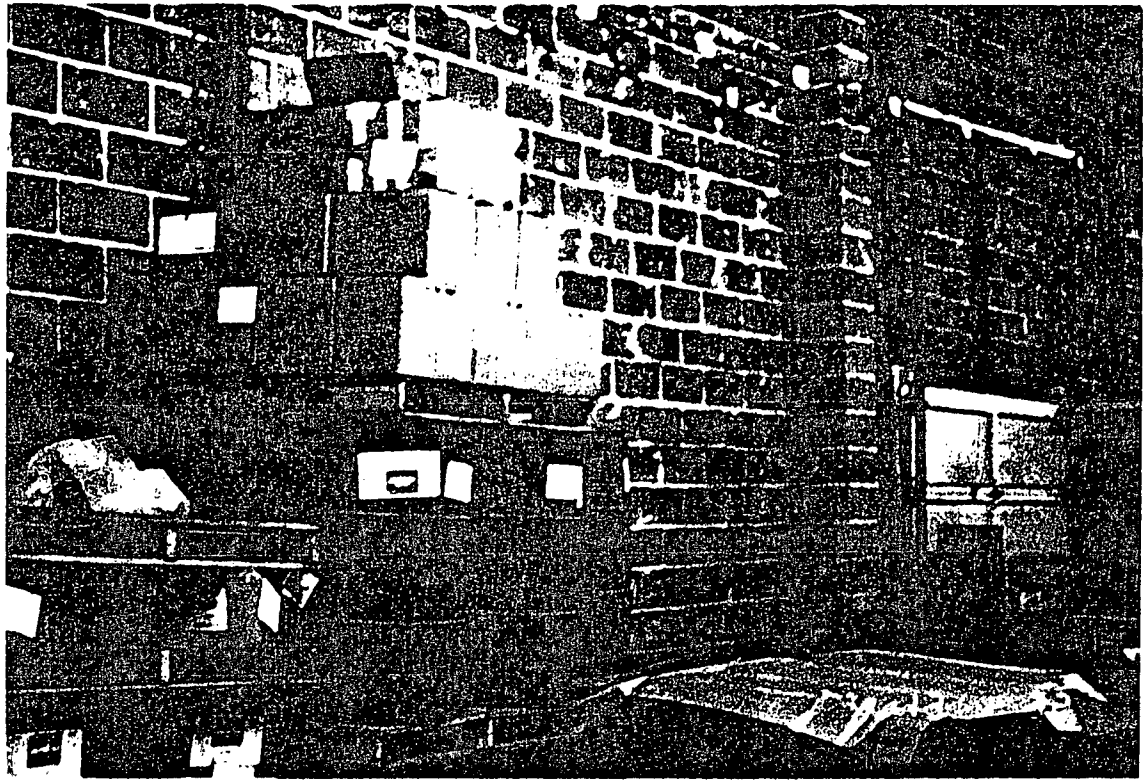
EPA OSC Hammack

DATE/TIME/DIRECTION

5-18-88/1253, 1304/N, W

COMMENTS: Note deteriorating condition of packaged product and evidence of leakage onto the warehouse floor.

27



TDD#: T06-8805-09 Pg. 7 of 11

PHOTOGRAPHER/WITNESS #24,25

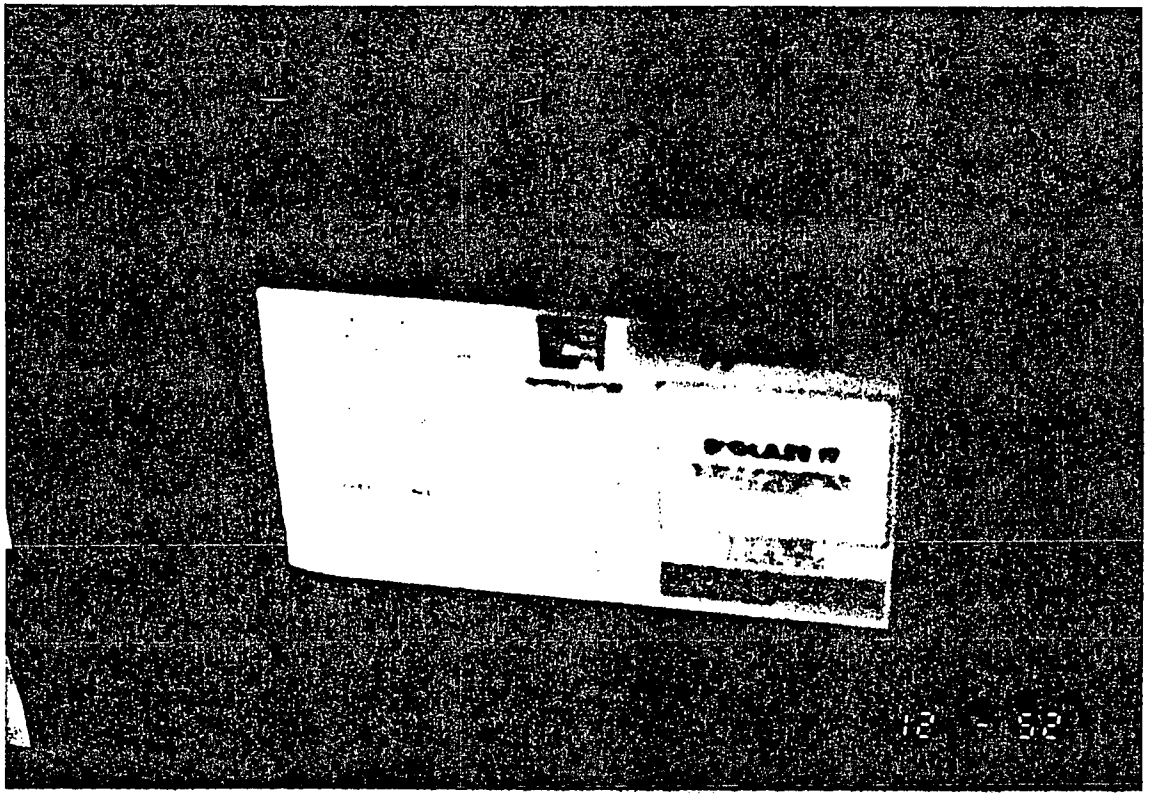
EPA OSC Hammack

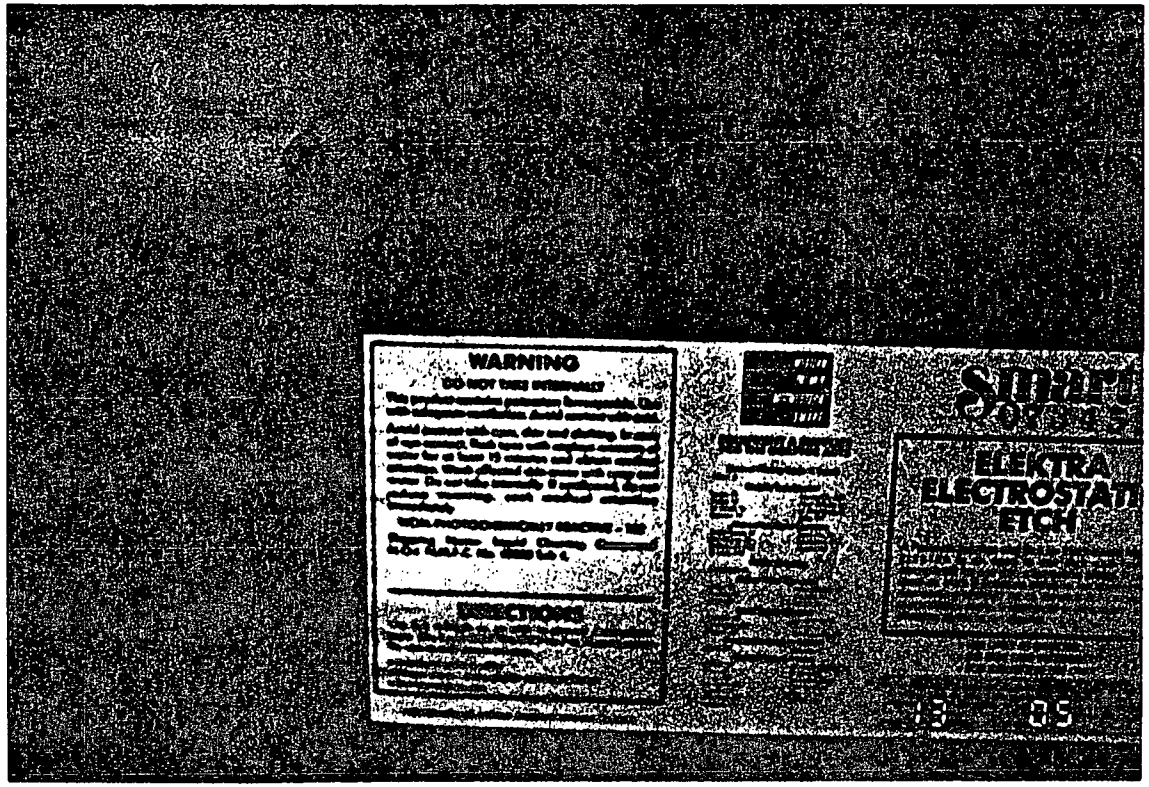
DATE/TIME/DIRECTION

5-18-88/1331, 1332/W, NE

COMMENTS: Product stored along the north wall. A metal drum is bulging and one poly drum is inverted and leaking.

23





TDD#: T06-8805-09 Pg. 8 of 11

PHOTOGRAPHER/WITNESS #8,18

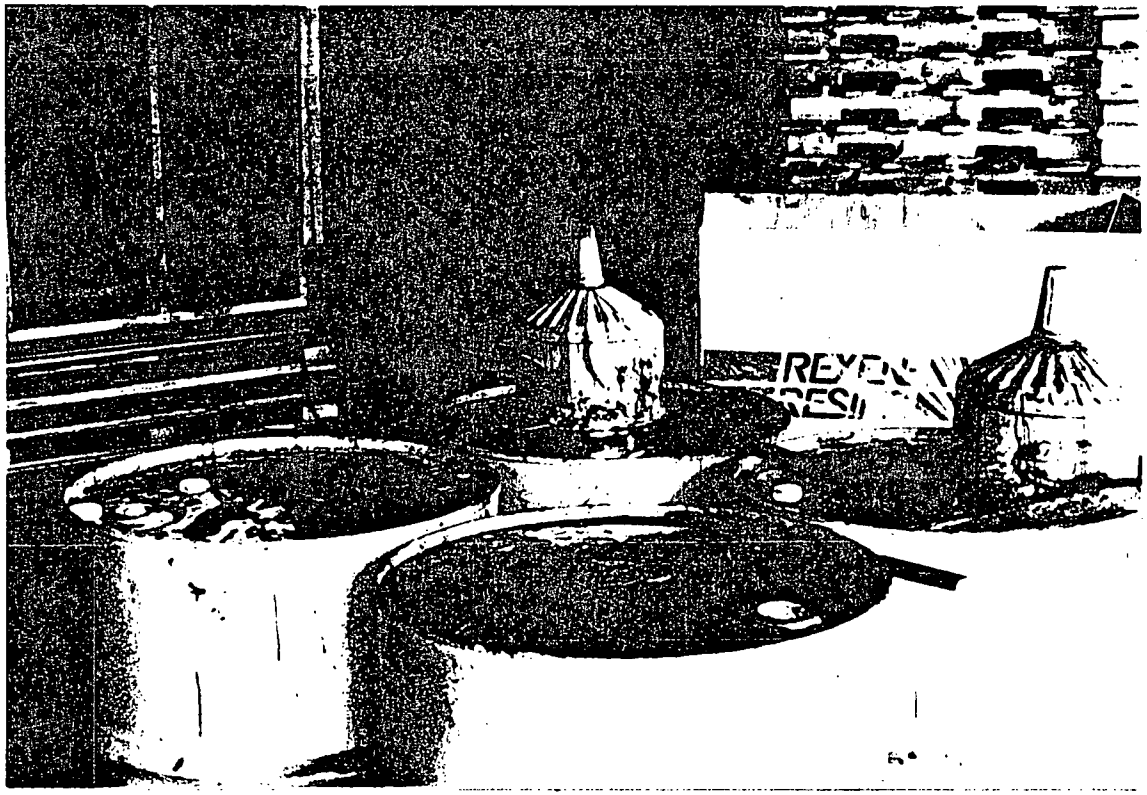
EPA OSC Hammack

DATE/TIME/DIRECTION

5-18-88/1252, 1305/W

COMMENTS: Close up view of deterioration of product. MSDS's indicate constituents toxic by absorption and inhalation.

24



TDD#: T06-8805-09 Pg. 9 of 11

PHOTOGRAPHER/WITNESS #19,20

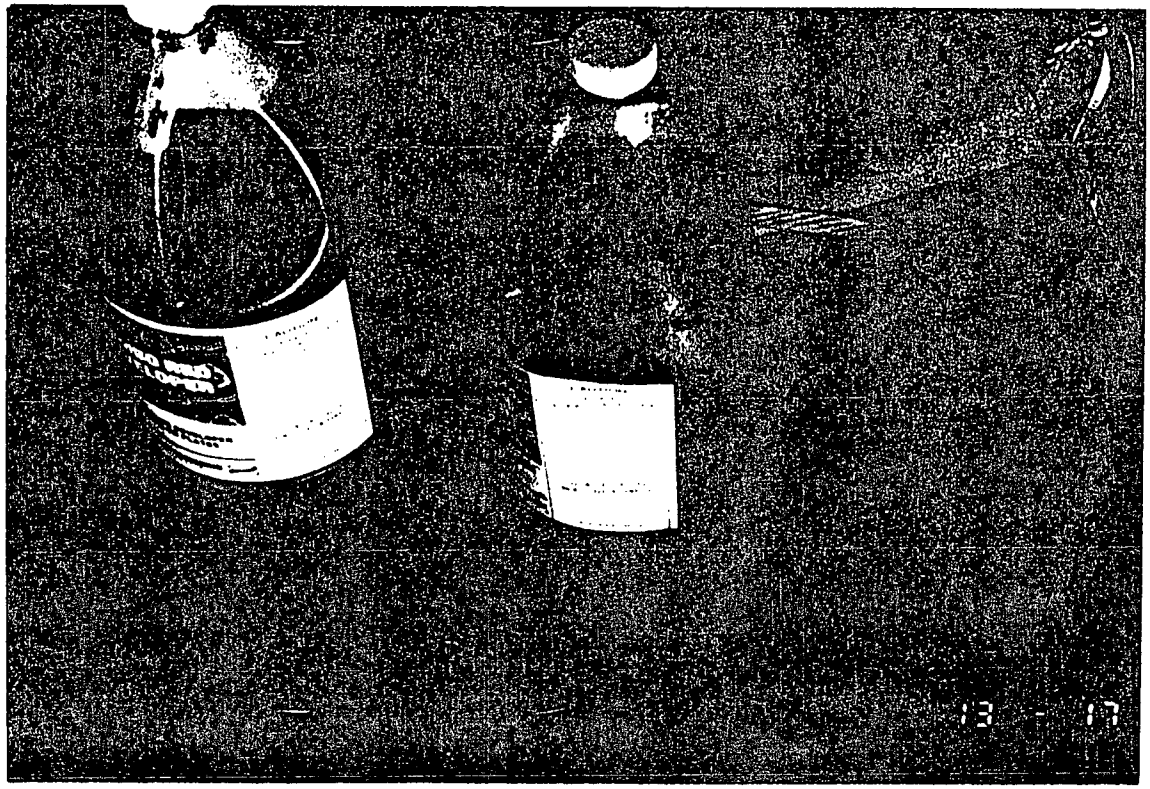
EPA OSC Hammack

DATE/TIME/DIRECTION

5-18-88/1316/NE, Down

COMMENTS: Repackaging of leaking Combo Red Developer was in progress.

25



TDD#: T06-8805-09 Pg. 10 of 11

PHOTOGRAPHER/WITNESS #21,22

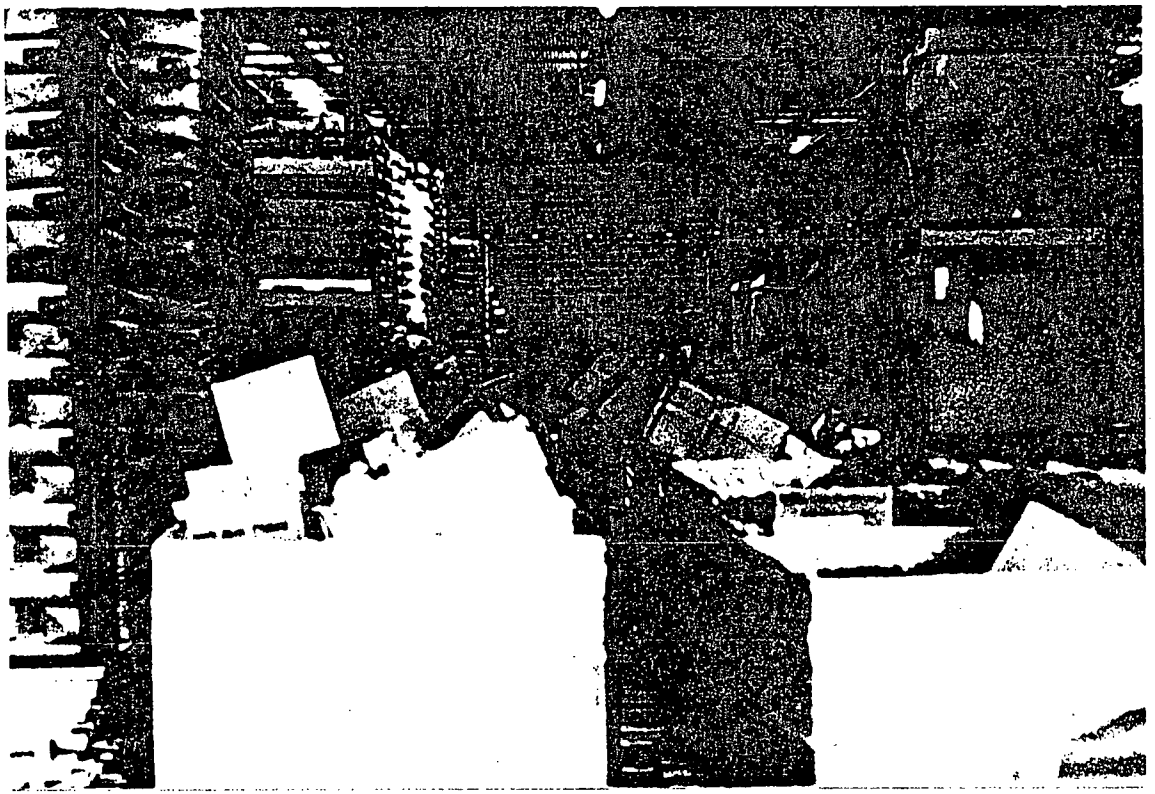
EPA OSC Hammack

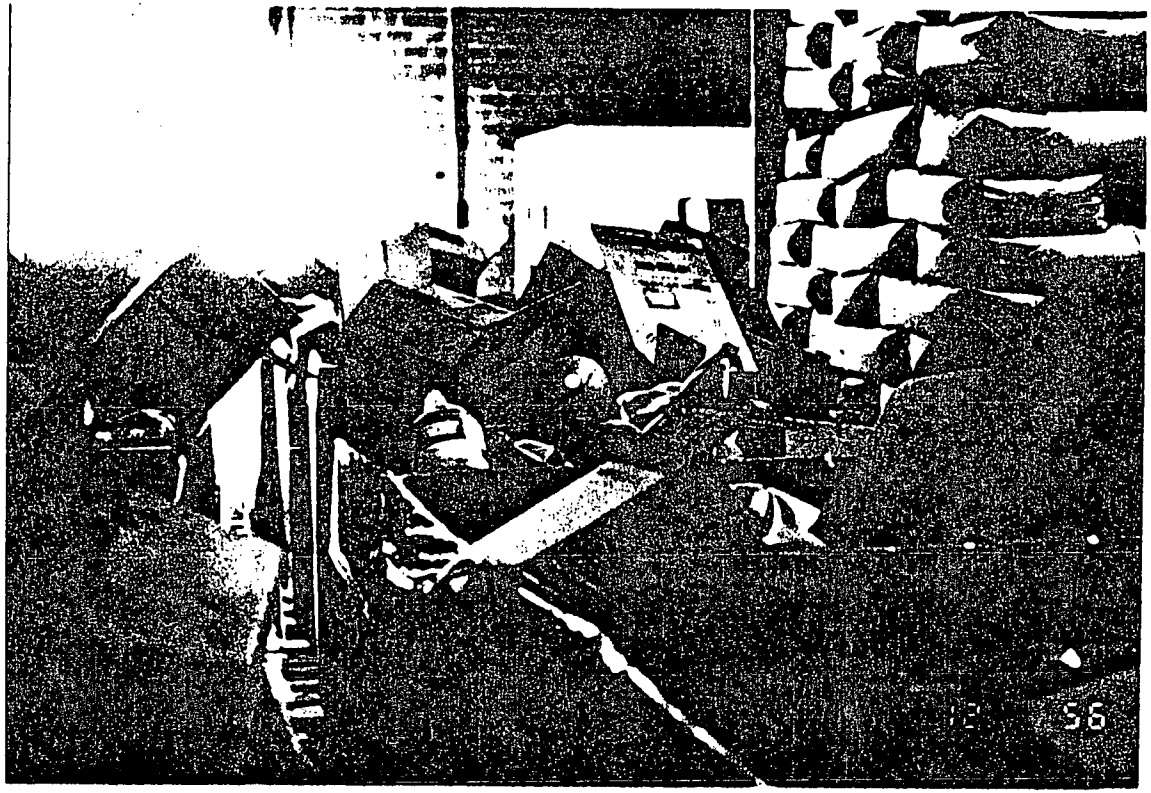
DATE/TIME/DIRECTION

5-18-88/1317/Down

COMMENTS: Note deteriorating cases of Combo Red Developer.

24





TDD#: T06-8805-09 Pg. 11 of 11

PHOTOGRAPHER/WITNESS #12,16

EPA OSC Hammack

DATE/TIME/DIRECTION

5-18-88/1254, 1256/N, S

COMMENTS: Empty containers from repacking were placed in lined boxes.

27

PALMER WAREHOUSE & TRANSFER COMPANY, INC.

P. O. Box 15212
1040 Lockwood Drive (713) 675-6551
HOUSTON, TEXAS 77220

June 20, 1988

RECD
JUN 2[illegible] 1988

Ms. Holly Gray
Ecology and Environment, Inc.
6440 Hillcroft, Suite# 402
Houston, TX 77081

Dear Holly:

Enclosed please find copies of the Straight Bill of Lading and Agreement of sale for the S.C.I. Photographic and Development Chemicals.

Sampling of the remaining 63 drums should be completed by June 24, 1988. Kerry Lund of Lund & Associates will have the samples analyzed.

We are also pursuing contacting Hazardous Waste Disposal Organizations.

We look forward to working with you and should you require any further information, please contact me.

Very truly yours,

PALMER WAREHOUSE & TRANSFER CO., INC.

Edwin Seda
Operations Manager

ES:pw

Enclosure

cc: W. Hermann
T. Shamy

28

STRAIGHT BILL OF LADING — SHORT FORM — ORIGINAL — NOT NEGOTIABLE

RECEIVED, subject to the classifications and tariffs in [illegible] the date of the issue of this Bill of Lading.

PALMER WAREHOUSE & TRANSFER CO., INC.
P.O. BOX 15212 HOUSTON, TEXAS 77220

CARRIERS: SHOW THIS NUMBER ON YOUR FREIGHT BILLS

DATE	ORDER (B/L) NUMBER	P
6-9-88	01924	1
TO ARRIVE	ACCOUNT NUMBER	WHSE. BLDG. N
6-9-88		1020 LOCKWOOD D

CUST. #675-0537

SHIP TO LUND & ASSOCIATES
5524 HARVEY WILSON DRIVE
HOUSTON, TX

P.O. No.

VIA:

SCHEDULE:

COD AMOUNT $

CAR:

BROKER AND REQUISITION NO.:

SHIPMENT TENDERED IN SEGREGATED MANNER

If charges are to be prepaid, wr[illegible] or stamp here, "To be Prepaid."

FREIGHT CHARGE:

QUANTITY	ITEM CODE LOT NO.	DESCRIPTION INSTRUCTIONS	FREIGHT CODE	WEIGHT	LOCATION
60		DRUMS			
121		PAILS			
228		CARTONS			
		PHOTOGRAPHIC AND DEVELOPING CHEMICALS			

These goods are on consignment from Edwin Seda OF Palmer WAREHOUSE Company, Inc.
6/13/88

1

RECEIVED $ to apply in prepayme[illegible] charges on the [illegible] described hereon.

Agent or Cashier Per

(The signature [illegible] knowledges only the [illegible] prepaid.)

Charges advanced

Subject to Sect[illegible] Conditions of applica[illegible] lading, if this shipm[illegible] be delivered [illegible] consignee without re[illegible] the consignor, the [illegible] shall sign the [illegible] statement.

The carrier shall [illegible] delivery of this [illegible] without payment of fr[illegible] all other lawful charg[illegible]

(Signature of cons[illegible])

Truck No. & Driver

Time Arrived AM PM

Time Backed in AM PM

Departed AM PM

PIECES	KIND OF PACKAGE, DESCRIPTION OF ARTICLES, SPECIAL MARKS, & EXCEPTIONS	CODE	WEIGHT	RATE	AMOU
	12:00 to 4:30 @ $35.00/hr. 157.50 + 50.00 dlvry.				
409	← TOTAL PACKAGES	TOTAL WEIGHT →			

SHIPPER: PALMER WAREHOUSE & TRANSFER CO.
P.O. BOX 15212
HOUSTON, TX 77020

NOTE - Where the rate is dependent on va[illegible] shippers are required to state specifica[illegible] writing the agreed or declared value o[illegible] property. The agreed or declared value of the property is hereby stated specifically by the shipper to be not exceeding

PER

AGENT → PALMER WAREHOUSE & TRANSFER CO., INC.
P.O. BOX 15212 HOUSTON, TEXAS 77220

FOR ACCOUNT OF

RECEIVED THE ABOVE IN GOOD ORDER 6/13/88 AGENT

PER

NOTE TO CARRIER ▶ IF THIS IS A PREPAID SHIPMENT PLEASE SEND FREIGHT BILL TO ADDRESS LISTED IN STAMPED IMPRINT

† The Paper Bags, Fibre Pails, Fibre Drums, Fibre Boxes used for this shipment conform to the specifications set forth in the maker's certificate thereon, and all other Requirements of rules for these packages in Uniform Freight Classification and the National Motor Freight Classification.

Shipper's imprint in lieu of stamp not a part of bill of lading approved by the Inte[illegible] Commerce Commission.

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AGREEMENT OF SALE

Date: June 13, 1988

Seller: Palmer Warehouse and Transfer Co., Inc.
1040 Lockwood Drive
Houston, TX 77020

Purchaser: Lund & Associates
P.O. Box 1385
Humble, TX 77347

Merchandise: Misc. Photographic and Development Chemicals

Packaging: Boxes, Drums, Pails, etc.

Terms of Sale: Upon execution of this agreement, seller ~~relinquishes~~ and purchaser assumes title to the merchandise. Purchaser agrees to provide seller a copy of the contract of sale, upon resale of the merchandise. This is a Consignment Sale.

"Purchaser" shall afford "Seller" a 10% commission on the proceeds of the sale of the product, upon resale. Said payment shall be made promptly at the time of the sale.

The above commission shall be the sole consideration Seller is to receive for the merchandise. Seller makes no warranty, express or implied, with respect to the merchandise or its contents.

SELLER:

PALMER WAREHOUSE & TRANSFER CO., INC.

Stephen W. Dougherty
Controller/Chief Financial Officer

PURCHASER:

LUND & ASSOCIATES

Kerry G. Lund

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PALMER WAREHOUSE
SCI DRUM INVENTORY
(63 Drums)

1.	Acetaldehyde	Rusted
2.	Acetaldehyde	Rusted, Bulge near drum cap
3.	Alpha Methyl Styrene*	Rusted, Overpacked
4.	Alpha Methyl Styrene	Spout-type cap with bulge
5.	Aerosol A268	Overpacked fiber drum
6.	Aerosol A268	Overpacked fiber drum
7.	Acetaldehyde	Rusted
8.	Alpha Methyl Styrene	Spout-type cap with bulge
9.	Alpha Methyl Styrene	Rusted, Dented
10.	Aerosol A268	Overpacked fiber drum
11.	Aerosol A268	Overpacked fiber drum
12.	Unknown: Marked MVO-Trebacher***	Ring top
13.	Acetaldehyde	
14	Acetaldehyde	Rusted
15.	Acetaldehyde	Rusted
16.	Acetaldehyde	Rusted
17.	Pyramid Chemical: DMF Adhesive	
18.	Alpha Methyl Styrene	
19.	Alpha Methyl Styrene	
20.	Formaldehyde** No Visible Markings (On Western Co. Skid)	Rusted
21.	Acetaldehyde	Rusted
22.	Acetaldehyde	Rusted, Dented
23.	Formaldehyde** No Visible Markings (On Western Co. Skid)	Rusted
24.	Acetaldehyde	Rusted, Dented
25.	Alpha Methyl Styrene	
26.	Alpha Methyl Styrene*	Rusted top and side, Dented
27.	Acetaldehyde	Rusted
28.	Acetaldehyde	Rusted
29.	Acetaldehyde	Rusted
30.	Formaldehyde** No Visible Markings (On Western Co. Skid)	Rusted
31.	Alpha Methyl Styrene	
32.	Alpha Methyl Styrene	
33.	Acetaldehyde	Rusted
34.	Acetaldehyde	
35.	Armostat - 810	Ring top
36.	Formaldehyde** Western Co. Marking (On Western Co. Skid)	Rusted
37.	Acetaldehyde	Rusted
38.	Acetaldehyde	Rusted
39.	Acetaldehyde	Rusted
40.	Armostat - 810	Ring top
41.	Aerosol A268	Overpacked fiber drum
42.	Acetaldehyde	Rusted
43.	Formaldehyde** Western Co. Marking (On Western Co. Skid)	Rusted

SCI Drum Inventory Continued:

44.	Alpha Methyl Styrene*		Bulged top
45.	Alpha Methyl Styrene*		
46.	Alpha Methyl Styrene		
47.	Alpha Methyl Styrene		
48.	Aerosol A268	(Stored near	Overpacked fiber drum
49.	Aerosol A268	south wall between	Overpacked fiber drum
50.	Aerosol A268	double garage	Overpacked fiber drum
51.	Aerosol A268	doors.)	Overpacked fiber drum
52.	Diamond Shamrock		Overpacked short fiber drum in open 55-gal. metal drum
53.	Aerosol A268		Overpacked fiber drum
54.	Aerosol A268		Overpacked fiber drum
55.	Aerosol A268		Overpacked fiber drum
56.	Aerosol A268		Overpacked fiber drum
57.	Sun Co. Weed Killer	No Visible Markings (Identified by Palmer on 5-20-88)	
58.	Salvage - 80 Gallon Drum		Ring Top
59.	Salvage - 80 Gallon Drum		
60.	Salvage - 80 Gallon Drum		
61.	Diamond Shamrock		Short fiber drum
62.	Diamond Shamrock		Short fiber drum, Stained
63.	Salvage - 80 Gallon Drum		

* Assumed - No Visible Marking
Located on Chemcentral Skid
14-Drum Total - Agrees w/EPA 1-29-88 Inventory

**Formaldehyde - No Visible Marking Except for The Western Co. on #36, #43)
5-Drum Total - Agrees w/EPA 1-29-88 Inventory

***MVO-Trebacher Drum was not on EPA 1-29-88 Inventory

SUMMARY 63-DRUM TOTAL

Acetaldehyde		19 Drums
Formaldehyde		5 Drums
Alpha Methyl Styrene		14 Drums
Aerosol A268		13 Drums
Armostat 810		2 Drums
Diamond Shamrock:	Unknown	3 Drums
Pyramid Chemical:	DMF Adhesive	1 Drum
Sun Oil:	Weed Killer	1 Drum
Unknown:	Marked MVO-Trebacher	1 Drum
Salvage		4 Drums

PALMER WAREHOUSE
INVENTORY OF SCI PHOTOGRAPHIC & PRINTING MATERIAL
(In Order Inventoried May 18, 1988)

9 Drums	55 Gal (Metal)	Asphaltum Gum Etch Finisher
8 Cases	4-1 Gal	Dispatch Black Lacquer Developer
12 Cases	4-1 Gal	D'Glaze It
6 Cases	3 Gal	Elektro-Stat (Potassium Ferrocyanide)
12 Cases	4-1 Gal	Black Bristle Lacquer Developer
1 Case	4-1 Gal	Ultra Kem (Acid, No Cyanide)
32 Cases	4-1 Gal	Professional Universal Fountain Conc. (Cleaning Soln.)
9 Cases	4-1 Gal	Pure Gum Arabic
6 Cases	4-1 Gal	Ultra Kem (5 Damaged, 4 Leaking)
64 Cases	4-1 Gal	D'Glaze It
2 Cases	4-1 Gal	Black to Yellow (B-T-Y) #1 Quick Color Wash
3 Pails	5 Gal	Elektra Electrostatic Etch
1 Case	4-1 Gal	Super Sensitizer Coating
1 Case	4-1 Gal	Dispatcher Black Lacquer Developer
2 Cases	4-1 Gal	Big Red Machine Lacquer Developer
7 Cases	4-1 Gal	Lithographic Chemical Preparation (Cleaning Soln.)
9 Cases	4-1 Gal	Kem Guard (Acid Soln.)
18 Cases	4-1 Gal	Dispatch Black Lacquer Developer (Acid)
20 Cases	4-1 Gal	Elektra Electrostatic Etch (Cyanide)
35 Cases	4-1 Gal	Tray Cleaner (Dichromate)
11 Cases	4-1 Gal	Elektro-Stat (Potassium Ferrocyanide)
2 Cases	4-1 Gal	Dispatch Black Lacquer Developer
19 Pails	5 Gal	Elektra Electrostatic Etch
14 Cases	4-1 Gal	Elektra Electrostatic Etch
11 Cases	4-1 Gal	Kem Kwik Finisher (Acid)
37 Cases	4-1 Gal	Prof. Univ. Fountain Conc.
5 Cases	4-1 Gal	Pure Gum Arabic 8° BE
12 Cases	4-1 Gal	Prof. Univ. Fountain Conc.
2 Cases	4-1 Gal	Kem Kwik Developer
3 Drums	55-Gal (Poly, 1 Bent)	Deep Etch Positive Synthesizer
4 Drums	55-Gal (Poly)	Prof. Univ. Fountain Conc.
2 Drums	55-Gal (Poly)	Ultra Kem
1 Drum	55-Gal (Metal)	Unknown (Similar to 17-H Disposal Drum)
80 Pails	5 Gal	D'Glaze It
2 Cases	4-1 Gal	Unknown (White Cartons)
9 Cases	4-1 Gal	Kem Guard
2 Cases	4-1 Gal	On-the-Fly
7 Cases	4-1 Gal	Plate Gum 14° Baume Lithkemko 2432
6 Cases	4-1 Gal	D'Glaze It
8 Drums	55 Gal (Poly)	Slow Developer (Corrosive) for Bimetalic Deep Etching Plates
30 Cases	4-1 Gal	D'Glaze It
5 Drums	55 Gal (Poly)	Mineral Fountain Solution (Acid)
8 Cases	5 Gal	Pure Arabic Gum
6 Cases	5-Gal	Elektro-Stat
4 Cases	5-Gal	News Plate Finisher
2 Drums	35-Gal (Fiber)	Imperial Fountain Conc. (Acid)
1 Drum	55-Gal (Metal)	D'Glaze It
4 Cases	4-1 Gal (Leaking)	Lasa Kote Developer (Warning Labels)
3 Drums	55-Gal (Poly)	Prof. Univ. Fountain Conc.
3 Drums	55-Gal (Poly)	Deep Etch Positive Sensitizer (1 Drum Upside-down, Leaking)
1 Drum	55-Gal (Metal, Bulged)	D'Glaze It (Tested 10/83, DOT R-1545)
1 Drum	55-Gal (Poly)	Deep Etch Positive Senzitizer (Drum Lying on Side)
19 Cases (Est)	4-1 Gal	Combo Red Developer (SE Corner Storage Room)
(1 Skid, 4 Tiers of Boxes)		Unknown (Beyond Flattened Boxes)

4,693+ Gallons

SCI MATERIAL INVENTORIED AT PALMER-PACK WAREHOUSE
May 18, 1988

SUMMARY OF SCI 63-DRUM TOTAL:

Container	Manufacturer	Chemical	Hazard
19 Metal 55 Gal Drums (17 Rusted, 2 Dented, 1 Bulged)	The Western Co.	Acetaldehyde	Toxic, Flammable, Explosive
5 Metal 55 Gal Drums (5 Rusted)	The Western Co.	Formaldehyde	Toxic, Carcinogen, Flammable
14 Metal 55 Gal Drums (3 Rusted, 2 Dented, 3 Bulged Cap)	Chemcentral	Alpha Methyl Styrene	Toxic, Combustible
13 Fiber Drums in Open, Metal 55 Gal Drums	American Cyanamid	Aerosol A268	No Hazardous Ingredients/Chemce[illegible]l
3 Fiber Drums, (1 in an Open, Metal 55 Gal Drum, 1 Stained)	Diamond Shamrock	Unknown	
2 Metal 55 Gal Drums	Armax	Armostat 810 - Unknown	
1 Metal 55 Gal Drum	Pyramid Chemical	DMF Adhesive - Unknown	
1 Metal 55 Gal Drum	Sun Oil	Weed Killer - Unknown	
1 Metal 55 Gal Drum	Marked MVO-Tribacher	Unknown	
4 Metal 85 Gal Drums	(Salvage Drums)	Unknown	

SUMMARY OF PHOTOGRAPHIC/PRINTING MATERIAL:

Container	Volume	Product	Hazardous Chemical Constituent
9 Metal Drums	495 Gal	Asphaltum Gum Etch Finisher (Repackaged from Cases)	
29 Cases	116 Gal	Dispatch Black Lacquer Developer	*Acetic Acid, Cyclohexanone, Cyclohexanol, Glycol Ether DPM
112 Cases, 80 Cans, 2 Metal Drums	958 Gal	D'Glaze It - Combustible, Toxic (1 drum bulged)	*Hexane, Methylene Chloride, Isopropyl Alcohol
23 Cases	92 Gal	Elektro-Stat	*Potassium Ferrocyanide
53 Cases, 3 Pails	246 Gal	Elektra Electrostatic Etch - Combustible, Toxic	*Hexane, Methylene Chloride, VM&P 66/3, Isopropyl Alcohol
12 Cases	48 Gal	Black Bristle Lacquer Developer - Combustible	*Acetic Acid,Cyclohexanone, Butyl Cellosolve
7 Cases, 2 Poly Drums	138 Gal	Ultra Kem (5 cases leaking, 4 damaged)	*Chrome Alum, Phosphoric Acid
81 Cases, 7 Poly Drums	709 Gal	Prof. Univ. Fountain Conc. - Combustible, Toxic	*Ektasolv EP, Butyl Cellosolve, Isopropyl Alcohol
17 Cases	68 Gal	Pure Gum Arabic	*No Hazardous Chemicals
2 Cases	8 Gal	Black to Yellow B-T-Y #1 Quick Color Wash	
1 Case	4 Gal	Super Sensitizer Coating	
2 Cases	8 Gal	Big Red Machine Lacquer Devel. - Combustible, Toxic	*Acetic Acid, Cyclohexanone, Butyl Cellosolve

TAT Attachment #3

7 Cases	28 Gal	Lithographic Chemical Preparation (Cleaning Soln.)	
18 Cases	72 Gal	Kem Guard (Acid Soln.)	*Phosphoric Acid
35 Cases	140 Gal	Tray Cleaner - Corrosive, Carcinogen	*Sodium Dichromate
11 Cases	44 Gal	Kem Kwik Finisher	*No Hazardous Chemicals
5 Cases	20 Gal	Pure Gum Arabic 8° BE	*No Hazardous Chemicals
2 Cases	8 Gal	Kem Kwik Developer - Combustible	*Ketone, Organic Acid
7 Poly Drums	385 Gal	Deep Etch Positive Synthesizer - Corrosive, Carcinogen (1 drum bent, 1 upside down & leaking, 1 on side)	*Ammonium Bichromate, Ammonium Hydroxide, Butyl Cellosolve
1 Metal Drum	55 Gal	Unknown (Similar to 17-H Disposal Drum)	
2 Cases	Est 8 Gal	Unknown (White Cartons)	
2 Cases	8 Gal	On-the-Fly - Corrosive, Combustible	*Sulfuric Acid, Ethylene Glycol, Mineral Spirits
7 Cases	28 Gal	Plate Gum 14° Baume Lithkemko 2432	
8 Poly Drums	440 Gal	Slow Developer for Deep Etching Plates - Corrosive	
5 Poly Drums	275 Gal	Mineral Fountain Soln. - Combustible	*Chromic Chloride, Phosphoric Acid
4 Cases	20 Gal	News Plate Finisher	*No Hazardous Chemicals
2 Fiber Drums	70 Gal	Imperial Fountain Conc. (Acid)	
4 Cases	20 Gal	Lasa Kote Developer (Warning Labels) (Cases leaking)	
19 Cases (Est)	76 Gal	Combo Red Developer (SE Corner Storage Room)	*Acetic Acid, Hydrogen Cyanide
Total	4,693 Gal		

*Information from Anchor/Lithkemko MSDS Sheets

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Threshhold Limit Values (TLV)
for
SCI Chemical Constituents
Palmer Warehouse

Chemical	CAS #	TLV	Synonym
Acetaldehyde	75-07-0	100 ppm	
Acetic Acid	64-19-7	10 ppm	
Alpha Methyl Styrene	98-83-9	50 ppm in Air	
Ammonium Bichromate	7789-09-5	0.05 mg/m^3	Hexavalent Chromium (Chromium VI)
Ammonium Hydroxide	1336-21-6	25 ppm	
Butyl Cellosolve	111-76-2	25 ppm (Skin)	2-Butoxyethanol
Chrome Alum (dust)	7788-990	0.5 mg/m^3	Chromium Potassium Sulfate
Chromic Chloride (dust)	10025-73-7	0.5 mg/m^3	
Cyclohexanol	108-93-0	50 ppm	Cyclohexyl Alcohol
Cyclohexanone	108-94-1	25 ppm (Skin)	
Ektasolv EP	2807-30-9	25 ppm/Mfgr	Ethylene Glycol Monopropyl Ether
Ethylene Glycol	107-21-1	50 ppm	
Formaldelyde	50-00-0	1 ppm in Air	
Glycol Ether DPM	34590-94-8	100 ppm	Dipropylene Glycol Monoethyl Ether
Hexane	110-54-3	50 ppm (Skin)	Textile Spriits
Hydrogen Cyanide	74-90-8	10 ppm (Skin)	
Isopropyl Alcohol	67-63-0	400 ppm	Isopropanol
Ketone		50 ppm	
Methylene Chloride	75-09-2	75 ppm	Dichloromethane
Mineral Spirits	8030-30-6	100 ppm/Mfgr	
Organic Acid		5-1510 ppm	
Phosphoric Acid	7664-38-2	1.0 mg/m^3	
Potassium Ferrocyanide	13943-58-3	NE	
Sodium Dichromate	10588-01-09	50 mg/m^3	
Sulfuric Acid	7664-93-9	1 mg/m^3	
VM&P 66/3	8030-30-6	100 ppm/Mfgr	Blend of C_{10}-C_{11} Paraffins & Cycloparaffins

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TAT Attachment #4

PALMER WAREHOUSE
SCI INVENTORY DOCUMENTATION

SUMMARY OF SCI STORED MATERIAL:

Stored Material	Manufacturer	Chemical	Documentation
19 Metal Drums	The Western Co.	Acetaldehyde	See Detail #1
5 Metal Drums	The Western Co.	Formaldehyde	See Detail #1
14 Metal Drums	Chemcentral	Alpha Methyl Styrene	*
13 Fiber Drums	American Cyanamid	Aerosol A268	*
3 Fiber Drums	Diamond Shamrock	Unknown	See Detail #2
2 Metal Drums	Armax	Armostat 810 - Unknown	*
1 Metal Drum	Pyramid Chemical	DMF Adhesive - Unknown	*
1 Metal Drum	Sun Oil	Weed Killer - Unknown	*
1 Metal Drum	Marked MVO-Tribacher	Unknown	No Documentation
4 Metal Drums	(Salvage Drums)	Unknown	*
Drums, Cases, Pails	Anchor/Lithkemko	Photographic/Printing	See Detail #3

*Documentation only by Palmer Internal Warehouse Log

- Documentation Detail #1: 19 Drums Acetaldehyde & 5 Drums Formaldehyde

Packing List
Shipper # C0235
Date: 3-29-85
From SCI to SCI c/o Palmer Warehuse
1234 Kress St.
Houston, Tx. 77020

Shipper: Bull Chemical Company
6327 Darby Way
Spring, Texas

Palmer Invoice #9635
(For Handling
24 Drums)
Date: 3-29-85
Billed SCI Equipment & Technology
200 South 14th Avenue
Mt. Vernon, N. Y. 10580
Attn: Hugh Wright

Palmer Internal
Warehouse Log
19 Drums Acetaldehyde
5 Drums Formaldehyde
Date: 3-29-85
Shipper: Bull Chemical Company

- Documentation Detail #2: 3 Diamond Shamrock Drums (Inventoried)

Palmer Pickup Order
#8505
80 Drums Surplus Chemicals
Weight: 24,000#
Date: 11-16-84
From Diamond Shamrock - Deliver to: 1060 Lockwood
Tidal Gate #1 or 2
Deer Park, Texas

For Account of: SCI Equipment

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Shipping Order Date: 11-19-84 From Diamond Shamrock to SCI Equipment & Technology
80 Drums Surplus Deer Park, Texas
Chemicals, N.O.S.
Weight: 24,000# Routing/Carrier Instructions: Customer Truck

Palmer Invoice #8526 Date: 11-19-84 Billed SCI Equipment & Technology
(For Pickup, Handling, Address As Above
Storage)

Palmer Internal Date: None Carrier: Palmer
Warehouse Log
4 Fiber Drums - Contents Not Designated

- Documentation Detail #3: Anchor/Lithkemko Photographic/Printing Supplies

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Letter Date: 11-9-87 From Anchor/Lithkemko to: Palmer Warehouse
50 Industrial Loop North P. O. Box 15212
P. O. Box 979 Houston, Texas 77220
Orange Park, Fl. 32067

Letter Statements;

Material Safety Data Sheets for product stored at Palmer Warehouse by Signo Crating of Mt. Vernon, N. Y.
Anchor Lithkemko did not enter into a contractural agreement with Palmer Warehouse... The product was sold to Signo and shipped prepaid to your warehouse per Signo. Palmer Warehouse acted as an agent for Signo and accepted the material for Signo. The material belongs to Signo and any problems which your warehouse encounters with moving the material needs to be handled within your own organization and/or with Signo.

---13 Pallets (Skids):

Freight Bill #129153 Date: 11-30-84 From Anchor/Lithkemko to Palmer Warehouse
Shipper #1950 (Sante Fe 1040 Lockwood Dr.
13 Pallets Cleaning Compounds Springs, Ca.)
Weight: 19,373#

Shipper: Superior Fast Freight
P. O. Box 60100, Terminal Annex
Los Angeles, Ca. 90060

Palmer Work Order Date: 12-4-84 Repallatize 13 Pallets
Freight Bill #129153

Palmer Invoice #8359 Date: 1-29-85 Billed SCI Equipment & Technology
(For Handling & Address As Above
Storage of 13 Pallets
Rec'd Via Superior Fast Freight)

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---26 Skids:

Manifest #28837 Date: 12-19-84 From Anchor/Lithkemko to Palmer Warehouse
26 Skids Flammable & (Dallas, Texas) 1040 Lockwood Dr.
Corrosive Liquids
Weight: 32,582#
510 Pieces: 1 Drum Leaking - Had Fallen Off Pallet
5 Cases Stained
Shipper: Big State Freight Lines, Inc.
2355 Stemmons (P. O. Box 47826)
Dallas, Texas 75247

Bill of Lading Date: 12-19-84 From Anchor/Lithkemko to Palmer Warehouse
Shipper #P02026 (Dallas, Texas) 1040 Lockwood Dr.
26 Skids, 510 Pieces
Weight: 32,582# Shipper: Big State Freight Lines
Address As Above

Palmer Work Order Date: 12-20-84 Restack 26 Pallets
Manifest #28837

Palmer Invoice #8360 Date: 1-29-85 Billed SCI Equipment & Technology
(For Handling & Address As Above
Storage of 26 Pallets
Rec'd Via Big State)

- Other Documentation (Some Material Not Tied to Specific Stored Material):

Certified Letter Date: 5-28-85 Palmer to SCI Equipment & Technology
Address As Above

Invoice #8526 Diamond Shamrock 11-19-84 Pickup, Handling & Nov., 1984 (1/2 Mo.) Storage
Invoice #8359 Anchor/Lithkemko 12-04-84 Handling & Dec., 1984 Storage
Invoice #8360 Anchor/Lithkemko 12-20-84 Handling & Dec., 1984 (1/2 Mo.) Storage
Invoice #8361
Invoice #9147
Invoice #9476
Invoice #9635 Acetaldehyde & Formaldehyde 3-29-85 Handling Charge
Invoice #9842

Palmer Internal Date: None 19 Acetaldehyde Drums (Noted Above)
Warehouse Log 5 Formaldehyde Drums (Noted Above)
Total 90 Drums 13 Aerosol A268 Drums in Overpack Drums
2 Armostat 810 Drums

38 Fiber Drums (1 Bent on Top)
(Includes 4 w/Palmer as Carrier & Noted with
Diamond Shamrock Documentation)
8 Drums (1 Designated as Steel)
4 Overpack Drums

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TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087

REF 06

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2050-0039, expires 9-30-88

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. TXP490102612 Manifest Document No. 00001

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
PALMER WAREHOUSE
1040 Lockwood Dr. Houston TX 77020
ED SEDA

4. Generator's Phone (713) 673-9084

A. State Manifest Document Number NO 00557898

B. State Generator's ID XXX 07

5. Transporter 1 Company Name: Beeline Services INC.

6. US EPA ID Number: TXD980309859

C. State Transporter's ID 40421

D. Transporter's Phone (713) 474-7772

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Heat Energy Advanced Technology
4460 Singleton Blvd.
DALLAS TX 75212

10. US EPA ID Number: TXD980624035

G. State Facility's ID 50029

H. Facility's Phone (214) 637-6434

11A. HM	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
X	a. HAZARDOUS WASTE Liquid NOS CRM-E NA 9189 Acetaldehyde 19 drum 5	024	DM	01248	G	D001 993001
X	b. WASTE Flammable Liquid NOS Flammable Liquid UN1993	014	DM	00728	G	D001 990001
	c. ~~3 PN dromethyl~~ 14 a methyl Styrene					
	d.					

J. Additional Descriptions for Materials Listed Above
11.a Acetaldehyde + water · 19 drums S5283
5 drums S5282
11.b. Alpha methyl Styrene S5217

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Eduardo Seda — Signature — Month 11 Day 16 Year 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials — Date

Printed/Typed Name: Dean McCary — Signature — Month 11 Day 16 Year 88

18. Transporter 2 Acknowledgement of Receipt of Materials — Date

Printed/Typed Name — Signature — Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Date

Printed/Typed Name — Signature — Month Day Year

TWC-0311 (Rev.11-06-86) White - original Pink-TSD Facility Yellow-Transporter Green-Generator's first copy

5520 12

RESTRICTED FROM LAND DISPOSAL UNDER 40 CFR 2[illegible]

This notification is submitted to HEAT ENERGY ADVANCED TECHNOLOGY, INC. in accordance with the Land Disposal Restrictions, Final Rule (effective November 8, 1986) and the "California List" (effective July 8, 1987) under 40 CFR 268.7(a)(1). According to these final rules, generators of certain E.P.A. Hazardous wastes must provide the following information with each shipment delivered to a treatment facility: no waste which exceeds any treatment standards or concentration limits may be utilized in land disposal until it can be certified by the treatment facility to meet the requirements.

1. Generator Name and Address: PALMER WAREHOUSE, 10410 LOCKWOOD DR., HOUSTON TX.

2. Waste profile number(s): 5-5282

3. E.P.A. Hazardous Waste Number(s): U001

4. Corresponding Treatment Standard (SEE BELOW)

5. Manifest number associated with this shipment: 00557595

6. Attach waste analysis, if available (first time only). NOTE: Generators using process knowledge must keep supporting data in their operating records).

A. CORRESPONDING TREATMENT STANDARD

Instructions: For each solvent waste constituent present in this waste or its extract, circle the treatment standard(s) which apply.

Solvent Constituents	TREATMENT STANDARD (mg/Liter) Wastewaters containing spent solvents	All other spent solvent wastes	Solvent Constituents	TREATMENT STANDARD (mg/Liter) Wastewaters containing spent solvents	All other spent solvent wastes
Acetone	0.050	0.590	Methylene Chloride	0.200	0.960
n Butyl Alcohol	5.000	5.000	Methyl. Chloride(pharmaceutical)	12.700	0.960
Carbon Disulfide	1.050	4.810	Methyl Ethyl Ketone (MEK)	0.050	0.750
Carbon tetrachloride	0.050	0.960	Methyl Iso Butyl Ketone (MIBK)	0.050	0.330
Chlorobenzene	0.150	0.050	Nitrobenzene	0.660	0.125
Cresols & Cresylic Acid	2.820	0.750	Pyridine	1.120	0.330
Cyclohexanone	0.125	0.750	Tetrachloroethylene	0.079	0.050
1,2 Dichlorobenzene	0.650	0.125	Toluene	1.120	0.330
Ethyl Acetate	0.050	0.750	1,1,1-Trichloroethane	1.050	0.410
Ethyl Benzene	0.050	0.053	1,1,2-Trichloroethane	1.050	0.960
Ethyl Ether	0.050	0.750	Trichloroethylene	0.062	0.091
Iso Butanol	5.000	5.000	Trichlorofluoromethane	0.050	0.960
Methanol	0.250	0.750	Xylene	0.050	0.150

B. CALIFORNIA LIST

Liquid hazardous wastes, including free liquids associated with any solid or sludge, containing the following metals (or elements) or compounds of these metals (or elements) at concentrations greater than or equal to those specified below.
INSTRUCTIONS: Circle the appropriate answers.

		Exceeds concentration limits (no treatment standards)	
(i)	Arsenic and/or compounds (as As) 500 mg/l	Yes	No
(ii)	Cadmium and/or compounds (as Cd) 100 mg/l	Yes	No
(iii)	Chromium (VI and/or compounds (as CR VI)) 500 mg/l	Yes	No
(iv)	Lead and/or compounds (as Pb) 500 mg/l	Yes	No
(v)	Mercury and/or compounds (as Hg) 20 mg/l	Yes	No
(vi)	Nickel and/or compounds (as Ni) 134 mg/l	Yes	No
(vii)	Selenium and/or compounds (as Se) 100 mg/l	Yes	No
(viii)	Thallium and/or compounds (as Tl) 130 mg/l	Yes	No

C. OTHER RESTRICTED WASTES (List Below)

RESTRICTED FROM LAND DISPOSAL UNDER 40 CFR 2[illegible])(1)

This notification is submitted to HEAT ENERGY ADVANCED TECHNOLOGY, INC. in accordance with the Land Disposal Restrictions, Final Rule (effective November 8, 1986) and the "California List" (effective July 8, 1987) under 40 CFR 268.7(a)(1). According to these final rules, generators of certain E.P.A. Hazardous wastes must provide the following information with each shipment delivered to a treatment facility: no waste which exceeds any treatment standards or concentration limits may be utilized in land disposal until it can be certified by the treatment facility to meet the requirements.

1. Generator Name and Address: PALMER WAREHOUSE, 1040 LOCKWOOD DR, HOUSTON, TX.

2. Waste profile number(s): 5-5217

3. E.P.A. Hazardous Waste Number(s): D001

4. Corresponding Treatment Standard (SEE BELOW)

5. Manifest number associated with this shipment: 00557398

6. Attach waste analysis, if available (first time only). NOTE: Generators using process knowledge must keep supporting data in their operating records).

A. CORRESPONDING TREATMENT STANDARD

Instructions: For each solvent waste constituent present in this waste or its extract, circle the treatment standard(s) which apply.

Solvent Constituents	TREATMENT STANDARD (mg/Liter) Wastewaters containing spent solvents	All other spent solvent wastes	Solvent Constituents	TREATMENT STANDARD (mg/Liter) Wastewaters containing spent solvents	All other spent solvent wastes
Acetone	0.050	0.590	Methylene Chloride	0.200	0.960
n Butyl Alcohol	5.000	5.000	Methyl. Chloride(pharmaceutical)	12.700	0.960
Carbon Disulfide	1.050	4.810	Methyl Ethyl Ketone (MEK)	0.050	0.750
Carbon tetrachloride	0.050	0.960	Methyl Iso Butyl Ketone (MIBK)	0.050	0.330
Chlorobenzene	0.150	0.050	Nitrobenzene	0.660	0.125
Cresols & Cresylic Acid	2.820	0.750	Pyridine	1.120	0.330
Cyclohexanone	0.125	0.750	Tetrachloroethylene	0.079	0.050
1,2 Dichlorobenzene	0.650	0.125	Toluene	1.120	0.330
Ethyl Acetate	0.050	0.750	1,1,1-Trichloroethane	1.050	0.410
Ethyl Benzene	0.050	0.053	1,1,2-Trichloroethane	1.050	0.960
Ethyl Ether	0.050	0.750	Trichloroethylene	0.062	0.091
Iso Butanol	5.000	5.000	Trichloroflurowethane	0.050	0.960
Methanol	0.250	0.750	Xylene	0.050	0.150

B. CALIFORNIA LIST

Liquid hazardous wastes, including free liquids associated with any solid or sludge, containing the following metals (or elements) or compounds of these metals (or elements) at concentrations greater than or equal to those specified below.
INSTRUCTIONS: Circle the appropriate answers.

		Exceeds concentration limits (no treatment standards)	
(i)	Arsenic and/or compounds (as As) 500 mg/l	Yes	(No)
(ii)	Cadmium and/or compounds (as Cd) 100 mg/l	Yes	(No)
(iii)	Chromium (VI and/or compounds (as CR VI)) 500 mg/l	Yes	(No)
(iv)	Lead and/or compounds (as Pb) 500 mg/l	Yes	(No)
(v)	Mercury and/or compounds (as Hg) 20 mg/l	Yes	(No)
(vi)	Nickel and/or compounds (as Ni) 134 mg/l	Yes	(No)
(vii)	Selenium and/or compounds (as Se) 100 mg/l	Yes	(No)
(viii)	Thallium and/or compounds (as Tl) 130 mg/l	Yes	(No)

C. OTHER RESTRICTED WASTES (List Below)

RESTRICTED FROM LAND DISPOSAL UNDER 40 CFR 2[illegible]

This notification is submitted to HEAT ENERGY ADVANCED TECHNOLOGY, INC. in accordance with the Land Disposal Restrictions, Final Rule (effective November 8, 1986) and the "California List" (effective July 8, 1987) under 40 CFR 268.7(a)(1). According to these final rules, generators of certain E.P.A. Hazardous wastes must provide the following information with each shipment delivered to a treatment facility: no waste which exceeds any treatment standards or concentration limits may be utilized in land disposal until it can be certified by the treatment facility to meet the requirements.

1. Generator Name and Address: PALMER WAREHOUSE, 1040 LOCKWOOD DR. HOUSTON, TX

2. Waste profile number(s): 5-5283

3. E.P.A. Hazardous Waste Number(s): U001

4. Corresponding Treatment Standard (SEE BELOW)

5. Manifest number associated with this shipment: 00557898

6. Attach waste analysis, if available (first time only). NOTE: Generators using process knowledge must keep supporting data in their operating records).

A. CORRESPONDING TREATMENT STANDARD

Instructions: For each solvent waste constituent present in this waste or its extract, circle the treatment standard(s) which apply.

Solvent Constituents	TREATMENT STANDARD (mg/Liter) Wastewaters containing spent solvents	All other spent solvent wastes	Solvent Constituents	TREATMENT STANDARD (mg/Liter) Wastewaters containing spent solvents	All other spent solvent wastes
Acetone	0.050	0.590	Methylene Chloride	0.200	0.960
n Butyl Alcohol	5.000	5.000	Methyl. Chloride(pharmaceutical)	12.700	0.960
Carbon Disulfide	1.050	4.810	Methyl Ethyl Ketone (MEK)	0.050	0.750
Carbon tetrachloride	0.050	0.960	Methyl Iso Butyl Ketone (MIBK)	0.050	0.330
Chlorobenzene	0.150	0.050	Nitrobenzene	0.660	0.125
Cresols & Cresylic Acid	2.820	0.750	Pyridine	1.120	0.330
Cyclohexanone	0.125	0.750	Tetrachloroethylene	0.079	0.050
1,2 Dichlorobenzene	0.650	0.125	Toluene	1.120	0.330
Ethyl Acetate	0.050	0.750	1,1,1-Trichloroethane	1.050	0.410
Ethyl Benzene	0.050	0.053	1,1,2-Trichloroethane	1.050	0.960
Ethyl Ether	0.050	0.750	Trichloroethylene	0.062	0.091
Iso Butanol	5.000	5.000	Trichlorofluoromethane	0.050	0.960
Methanol	0.250	0.750	Xylene	0.050	0.150

B. CALIFORNIA LIST

Liquid hazardous wastes, including free liquids associated with any solid or sludge, containing the following metals (or elements) or compounds of these metals (or elements) at concentrations greater than or equal to those specified below.
INSTRUCTIONS: Circle the appropriate answers.

		Exceeds concentration limits (no treatment standards)	
(i)	Arsenic and/or compounds (as As) 500 mg/l	Yes	(No)
(ii)	Cadmium and/or compounds (as Cd) 100 mg/l	Yes	(No)
(iii)	Chromium (VI and/or compounds (as CR VI)) 500 mg/l	Yes	(No)
(iv)	Lead and/or compounds (as Pb) 500 mg/l	Yes	(No)
(v)	Mercury and/or compounds (as Hg) 20 mg/l	Yes	(No)
(vi)	Nickel and/or compounds (as Ni) 134 mg/l	Yes	(No)
(vii)	Selenium and/or compounds (as Se) 100 mg/l	Yes	(No)
(viii)	Thallium and/or compounds (as Tl) 130 mg/l	Yes	(No)

C. OTHER RESTRICTED WASTES (List Below)

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2050-0039, expires 9-30-88

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. TXP490102612 Manifest Document No. 00002

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ED SEDA
PALMER WAREHOUSE
1040 Lockwood Dr. Houston TX 77020

4. Generator's Phone (713) 673-9084

A. State Manifest Document Number NO 00557896

B. State Generator's ID XXX07

5. Transporter 1 Company Name
Bealine Services INC.

6. US EPA ID Number TXD980809859

C. State Transporter's ID 40421

D. Transporter's Phone 474-7772

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
EMPAK INC
2759 Battleground Rd
Deer PARK TX 77536

10. US EPA ID Number TXD009767314 9

G. State Facility's ID 30567

H. Facility's Phone (713) 479-1990

11A. HM	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
	a. AEROSOL A268 NON Regulated Surfactant	013	DM	00676	G	112070 NONE
	b.					
	c.					
	d.					

J. Additional Descriptions for Materials Listed Above
11-a EM1912-3

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: Edwin seda
Signature: [signature]
Month 11 Day 16 Year 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: DEAN McCARY
Signature: Dean McCary
Date: Month 11 Day 16 Year 88

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Date: Month Day Year

TWC-0311 (Rev.11-06-86)

White - original Pink-TSD Facility Yellow-Transporter Green-Generator's first copy

EMPAK INC.

WASTE CERTIFICATION FORM

Please fill in the following:

Customer PALMER warehouse / moffeat

Contract and Stream Number EM 1912-31

Manifest Number 00557896

By checking the appropriate boxes and signing this form, I certify that the following is correct:

1) F-Listed Solvents (Mark A or B)

✓ (A) The waste stream stated herein does not contain any F-Listed Solvents specified under 40 CFR Part 148.10.

___ (B) The waste stream stated herein contains the waste material identified in 1.(A) of this Waste Certification Form under EPA Hazardous Waste Number _____, but in quantities of no more than 1% (by weight) at the point of origin.

2) California List Halogenated Organic Compounds (HOC's) (Mark A or B)

✓ (A) The waste stream stated herein does not contain any California List Halogenated Organic Compounds (see Attachment A on reverse for listing)

___ (B) The waste stream stated herein contains the waste material identified in 2.(A) of this Waste Certification Form under EPA Hazardous Waste Number _____, but in quantities of no more than 1% (by weight) at the point of origin.

3) Dioxins and PCB's (Mark the following box if it applies)

✓ I certify that the waste stream stated herein does not contain any dioxin wastes and does not contain PCB's greater than 50 parts per million.

4) Non Restricted (Mark the following box if it applies)

___ I certify that the waste stream stated herein is currently non-restricted by the U.S. E.P.A. according to 40 CFR Part 148.10, Part 148.11, or Part 148.12.

[illegible signature] 11/16/88

Signature and Date 9/6/88

MOHEAT, INC.

Box 721945
Houston, TX 77272-1945
713-496-4100

November 16, 1988

Palmer Warehouse
1040 Lockwood Dr.
Houston, Texas 77020

SUBJECT: Removal of 63 drums of hazardous material, all inclusive price.

Terms and conditions for the pick up and disposal of 63 drums of miscellaneous waste at the above mentioned warehouse.

$7500.00 COD
7500.00 net 30 days (1.5% each day after)
Total $15,000.00

Bijhan A. Naderi
Bijhan A. Naderi
CEO/Chemist

11/16/88
Date

Responsible Party
Palmer Warehouse

Moheat, Inc. is responsible for the pick up and removal of the above mentioned waste to an appropriate disposal facility. We will make ready all necessary documents and will prpare all the manifest in accordance with EPA regulations. Disposal proof will be sent to Palmer Warehouse upon the disposal of the waste. Moheat, Inc is assuming no legal liability for this material for the time before pick up or for after delivery to the appropriate disposal facility.

Bijhan A. Naderi
Bijhan A. Naderi
CEO/Chemist

Palmer Warehouse

11/16/88
Date

STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY
HAZARDOUS WASTE DIVISION
P.O. BOX 44307
BATON ROUGE, LOUISIANA 70804

RECYCLE / REUSE

MANIFEST № 815334

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039. Expires 9-30-88

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. TXP4901026120000 — Manifest Document No.

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
PALMER WAREHOUSE ED SEDA
1040 LOCKWOOD DR. HOUSTON TX 77020

4. Generator's Phone (713) 673-9084

A. State Manifest Document Number: 815334

B. State Generator's ID: TX XXX07

5. Transporter 1 Company Name: Bealine Services INC

6. US EPA ID Number: TXD980809559

C. State Transporter's ID: TX 40421

D. Transporter's Phone: (713) 474 7777

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
MARINE SHALE PROCESSORS, INC.
HIGHWAY 90 EAST
MORGAN CITY, LOUISIANA 70380

10. US EPA ID Number: LAD981057706

G. State Facility's ID

H. Facility's Phone: (504) 631-3161

GENERATOR

	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol.	I. Waste No.
a. X	HAZ 2,4 Dichlorophenoxy Acetic Acid ORM-A NA 2765	034	DF	00170	G	D240 R
b. X	WASTE combustible liquid NOS combustible liquid NA 1993 5 NN dimethylformamide 1 dimethyl-3 Dim.	011	DF	00055	G	D001 R
c.	Ion exchange Resin Non Regulated	004	DM	00655	P	NONE R
d.	Abmistat 810 Emulsifier Non Regulated	002	DM	00104		NONE R

J. Additional Descriptions for Materials Listed Above — RECYCLE / REUSE
11.a MOH/PWH/8808404
11.b MOH/PWH/8808406
11.c MOH/PWH/8808402
11.d MOH/PWH/8808772

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

IF UNABLE TO DELIVER, RETURN TO GENERATOR

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR,** if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Edwin Seda — Signature: [signature] — Month Day Year: 11 16 88

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Dean McCary — Signature: [signature] — Month Day Year: 11 16 88

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name — Signature — Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name — Signature — Month Day Year

EPA Form 8700-22 (Rev. 9/86) Original-DEQ. Green-Generator's 2nd, Yellow-Disposer, Pink-**Transporter**, Gold-Generator 1st

DEQ FORM HW-3 (R 9/86)

MARINE SHALE PROCESSORS, INC.

LAND DISPOSAL RESTRICTIONS INFORMATION

Customer Name: [illegible] Customer EPA ID Number: [illegible]

Customer Address: [illegible] MCDS Document Number: [illegible]

[illegible] TX [illegible]

Under manifest number(s): [illegible], we are shipping to you, for use in the MSP recycling process, recyclable materials stream(s) classified as EPA Hazardous Waste Number(s):

_____.

A. The EPA land disposal restriction regulations (40 CFR 268)

___ APPLY to these materials, under the following category or categories:

___ Solvent/dioxin (See Attach. 1)

___ California list, specifically (See Attach. 2): _____.

___ "First Third" list (See Attach. 3)

X DO NOT apply to this stream. (Skip following questions. Sign on bottom of page.)

B. The stream cannot be landfilled because (check one):

___ 1. Incineration or recycling is the required technology to be used (See 40 CFR 268.42.), or

___ 2. PCB's (ARE NOT acceptable and NOT approved for shipment to MSP), or

___ 3. After November 8, 1988 -- wastes, except wastewaters, containing Halogenated Organic Compounds in total concentration of 1000 mg/kg or 1000 mg/l, or more.), or

___ 4. The stream is an F001-F005 solvent, or a "First Third" waste containing organics or other non-metals (Attach. 3, Item 1). The following constituents identified in Table CCW or Table CCWE (See Attach. 4) of 40 CFR 268, must be treated to at least the level specified below (use reverse side for additional constituents):

Constituent	Treatment Standard	Per Table CCW	Per Table CCWE
			, or

___ 5. The stream is a liquid that is primarily water and contains HOC's in total concentration greater than or equal to 1,000 mg/l and less than 10,000 mg/l HOC's, or

___ 6. The stream is a "Soft Hammer" material containing organics or other non-metals (Attach. 3, Item 5).

I hereby certify that the information provided on this form is complete and accurate to the best of my knowledge and ability to determine.

Authorized Representative Signature: [signature]

Print or Type Name: Edward Sedia

Title: Vice-President Date: 11/16/88

MARINE SHALE PROCESSORS, INC.

LAND DISPOSAL RESTRICTIONS INFORMATION

Customer Name: palmer warehouse

Customer EPA ID Number: TXP490102612

Customer Address: 1040 Lockwood Dr.
Houston TX 77020

MCDS Document Number: 880840

Under manifest number(s): 853324, we are shipping to you, for use in the MSP recycling process, recyclable materials stream(s) classified as EPA Hazardous Waste Number(s):

_____.

A. The EPA land disposal restriction regulations (40 CFR 268)

___ APPLY to these materials, under the following category or categories:

___ Solvent/dioxin (See Attach. 1)

___ California list, specifically (See Attach. 2): _____.

___ "First Third" list (See Attach. 3)

X DO NOT apply to this stream. (Skip following questions. Sign on bottom of page.)

B. The stream cannot be landfilled because (check one):

___ 1. Incineration or recycling is the required technology to be used (See 40 CFR 268.42.), or

___ 2. PCB's (ARE NOT acceptable and NOT approved for shipment to MSP), or

___ 3. After November 8, 1988 --- wastes, except wastewaters, containing Halogenated Organic Compounds in total concentration of 1000 mg/kg or 1000 mg/l, or more.), or

___ 4. The stream is an F001-F005 solvent, or a "First Third" waste containing organics or other non-metals (Attach. 3, Item 1). The following constituents identified in Table CCW or Table CCWE (See Attach. 4) of 40 CFR 268, must be treated to at least the level specified below (use reverse side for additional constituents):

Constituent	Treatment Standard	Per Table CCW	Per Table CCWE
			, or

___ 5. The stream is a liquid that is primarily water and contains HOC's in total concentration greater than or equal to 1,000 mg/l and less than 10,000 mg/l HOC's, or

___ 6. The stream is a "Soft Hammer" material containing organics or other non-metals (Attach. 3, Item 5).

I hereby certify that the information provided on this form is complete and accurate to the best of my knowledge and ability to determine.

Authorized Representative Signature: [signature]

Print or Type Name: Edwin Soda

Title: Vice-President

Date: 11/16/88

MARINE SHALE PROCESSORS, INC.

LAND DISPOSAL RESTRICTIONS INFORMATION

Customer Name: PALMER WAREHOUSE Customer EPA ID Number: TXP49[illegible]

Customer Address: 1046 Lockwood Dr MCDS Document Number: 8[illegible]

HOUSTON TX 77020

Under manifest number(s): 815334, we are shipping to you, for use in the MSP recycling process, recyclable materials stream(s) classified as EPA Hazardous Waste Number(s):

_____.

A. The EPA land disposal restriction regulations (40 CFR 268)

___ APPLY to these materials, under the following category or categories:

___ Solvent/dioxin (See Attach. 1)

___ California list, specifically (See Attach. 2): _____.

___ "First Third" list (See Attach. 3)

X DO NOT apply to this stream. (Skip following questions. Sign on bottom of page.)

B. The stream cannot be landfilled because (check one):

___ 1. Incineration or recycling is the required technology to be used (See 40 CFR 268.42.), or

___ 2. PCB's (ARE NOT acceptable and NOT approved for shipment to MSP), or

___ 3. After November 8, 1988 --- wastes, except wastewaters, containing Halogenated Organic Compounds in total concentration of 1000 mg/kg or 1000 mg/l, or more.), or

___ 4. The stream is an F001-F005 solvent, or a "First Third" waste containing organics or other non-metals (Attach. 3, Item 1). The following constituents identified in Table CCW or Table CCWE (See Attach. 4) of 40 CFR 268, must be treated to at least the level specified below (use reverse side for additional constituents):

Constituent	Treatment Standard	Per Table CCW	Per Table CCWE
			, or

___ 5. The stream is a liquid that is primarily water and contains HOC's in total concentration greater than or equal to 1,000 mg/l and less than 10,000 mg/l HOC's, or

___ 6. The stream is a "Soft Hammer" material containing organics or other non-metals (Attach. 3, Item 5).

I hereby certify that the information provided on this form is complete and accurate to the best of my knowledge and ability to determine.

Authorized Representative Signature: [signature]

Print or Type Name: Edwin Soda

Title: Vice-President Date: 11/16/88

MARINE SHALE PROCESSORS, INC.

LAND DISPOSAL RESTRICTIONS INFORMATION

Customer Name: PALMER Warehouse

Customer EPA ID Number: TXP4911026 12

Customer Address: 1040 Lockwood Dr.
HOUSTON TX 77020

MCDS Document Number: 880406

Under manifest number(s): 815334, we are shipping to you, for use in the MSP recycling process, recyclable materials stream(s) classified as EPA Hazardous Waste Number(s):

_____.

A. The EPA land disposal restriction regulations (40 CFR 268)

___ APPLY to these materials, under the following category or categories:

___ Solvent/dioxin (See Attach. 1)

___ California list, specifically (See Attach. 2): _____.

___ "First Third" list (See Attach. 3)

X DO NOT apply to this stream. (Skip following questions. Sign on bottom of page.)

B. The stream cannot be landfilled because (check one):

___ 1. Incineration or recycling is the required technology to be used (See 40 CFR 268.42.), or

___ 2. PCB's (ARE NOT acceptable and NOT approved for shipment to MSP), or

___ 3. After November 8, 1988 --- wastes, except wastewaters, containing Halogenated Organic Compounds in total concentration of 1000 mg/kg or 1000 mg/l, or more.), or

___ 4. The stream is an F001-F005 solvent, or a "First Third" waste containing organics or other non-metals (Attach. 3, Item 1). The following constituents identified in Table CCW or Table CCWE (See Attach. 4) of 40 CFR 268, must be treated to at least the level specified below (use reverse side for additional constituents):

Constituent	Treatment Standard	Per Table CCW	Per Table CCWE
			, or

___ 5. The stream is a liquid that is primarily water and contains HOC's in total concentration greater than or equal to 1,000 mg/l and less than 10,000 mg/l HOC's, or

___ 6. The stream is a "Soft Hammer" material containing organics or other non-metals (Attach. 3, Item 5).

I hereby certify that the information provided on this form is complete and accurate to the best of my knowledge and ability to determine.

Authorized Representative Signature: [signature]

Print or Type Name: Eduardo Seda

Title: Vice-President

Date: 11/16/88

MARINE SHALE PROCESSORS, INC.

MATERIALS CHARACTERIZATION DATA SHEET

MCDS Document # [illegible]

MSP CODE: _____

Generator Name: PALMer Warehouse
Facility Address: 1040 Ledwood Rd
Houston TX 77020
City, State, Zip:
Technical Contact: EDWIN SEDA / BRENDA SANDEFER
Title: operations manager / SECRETARY
Telephone NO. (713) 673 9084 EXT:
Facility EPA ID #: TXD980102612

Bill To: MoHeat INC.
Company Contact: Bijhan Nader
Contanier Size: 55 gl
EPA Waste No.: D001
Generating Process: unused
Common Name of Waste: Solvent
Rate of Generation: (Quan) (Units) PER (Time Interval)
Volume in Storage: (Quan) 19 (Units) IN 55 gl (Container Size and Type)
Is Waste DOT Hazardous [X] YES [ ] NO
Proper DOT Shipping Name: HAZARDOUS waste Liquid NOS
Hazard Class: ORM-E ID No.: NA 9189
Transportation Equipment: VAN
Placarding: NONE

CHEMICAL COMPOSITION (No Trade Name)

(Totals must add up to 100%)

Acetaldehyde	20 %
WATER	80 %
	%
	%
	%
	%
	%

METALS (EP Toxicity Test, mg/1)

Arsenic (As)	NONE	Silver (Ag)	NONE
Barium (Ba)		Copper (Cu)	
Cadmium (Cd)		Nickel (Ni)	
Chromium (cr)		Zinc (Zn)	
Lead (Pb)			
Mercury (Hg)			
Selenium (Se)			

INORGANICS (mg/1 or ppm)

Total CN	NONE	Iodine	NONE
Free CN		Asbestos	
Sulfide			
Chloride			
Bisulfite			
Sulfite			
Sulfate			
Phosphate			
Flourine			
Bromine			
Chlorine			

ORGANICS (mg/1 or ppm)

Endr in	NONE	Organohalide	NONE
Methoxychlor		Mercaptans	//
Toxaphene			
2, 4-5			
2,4,5-T			
Phenol(ics)			
PCBs			
Dioxin			
TOC			

PHYSICAL DESCRIPTION

Physical State: [X] Liquid [ ] Semi-solid [ ] Solid
Phases/Layering: [X] Uni-Layer [ ] Bilayer [ ] Multilayer
Viscosity: [ ] High [ ] Medium [X] Low
Type of Solids: NONE [ ] Organic [ ] Inorganic [ ] Mixed
Total Solids (wt. %): <1 Suspended Solids (wt. %): <1
BTU/lb <1000 % Ash Content <5 % Water (by weight)
Flash Point (°F) >200 Type open
Specific Gravity 1.1
Boiling Point, (°C) 102 Freezing Point, (°C)
Vapor Pressure (mm Hg @ 24°C)
pH. (Avg) 7 (Range) 7 to 7
Total Alkalinity/Acidity (%)
Odor: mild organic
Color: clear

HAZARDOUS PROPERTIES

[ ] NONE
[ ] Water Reactive [ ] Reactive [ ] Explosive
[ ] Shock Sensitive [ ] Pyrophoric [ ] Polymriable
[ ] Radioactive [ ] Pesticide Residuals [ ] Ignitable
[ ] Corrotive [X] Toxic Vapor [ ] Pathogen
[ ] Biological [ ] Etiological
[ ] Other

REQUIRED PERSONNEL PROTECTIVE EQUIPMENT AND PROCEDURES:

Standard

PLEASE ATTACH ALL MATERIAL SAFETY DATA SHEETS, LOGISTIC SKETCHES, ANALYSIS REPORTS, HANDLING PRECAUTIONS, ADDITIONAL HAZARD SUPPORT INFORMATION, DATA & COMMENTS.

CERTIFICATION: I hereby certify that the above and attached description is complete and accurate to the best of my knowledge and ability to determine, that no deliberate or willful omission of composition or properties exists, and that all known or suspected hazards have been disclosed. I certify that the materials tested are representative of all the materials subject to the contract.

DATE 10/28/88 GENERATOR'S SIGNATURE: Edwin Seda / eds

MSP FORM 1040 (REV. JUNE/87)

MATERIALS CHARACTERIZATION DATA SHEET

MCDS Document # 880 8406

MSP CODE: _____

Generator Name: Palmer warehouse
Facility Address: 1040 Lockwood Dr.
Houston Tx 77020
c/o MOHEGT INC
City, State, Zip: _____
X Technical Contact: EDWIN. SEDA
Title: Operations Manager
Telephone NO. (713) 673-4084 EXT: _____
Facility EPA ID #: TXP 49 0100612

Bill To: MOHEGT INC Box 721945 Houston Tx 772
Company Contact: Bijhan A. Nadri
Contanier Size: 55 gl
EPA Waste No.: D001
Generating Process: Unused
Common Name of Waste: DMF Adhesive
Rate of Generation: _____ (Quan) _____ (Units) PER _____ (Time Interval)
Volume in Storage: 3 (Quan) (Units) IN 55 gl (Container Size and Type)
Is Waste DOT Hazardous [X] YES [ ] NO
Proper DOT Shipping Name: Waste Combustible liquid NOS
Hazard Class: F ID No.: NA 1993
Transportation Equipment: Van
Placarding: _____

CHEMICAL COMPOSITION (No Trade Name)

(Totals must add up to 100%)

N,N dimethyl formamide 100 %
_____ %
_____ %
_____ %
_____ %
_____ %
_____ %

METALS (EP Toxicity Test, mg/1)

Arsenic (As)	NONE	Silver (Ag)	NONE
Barium (Ba)		Copper (Cu)	
Cadmium (Cd)		Nickel (Ni)	
Chromium (cr)		Zinc (Zn)	
Lead (Pb)			
Mercury (Hg)			
Selenium (Se)			

INORGANICS (mg/1 or ppm)

Total CN	NONE	Iodine	NONE
Free CN		Asbestos	"
Sulfide			
Chloride			
Bisulfite			
Sulfite			
Sulfate			
Phosphate			
Flourine			
Bromine			
Chlorine			

ORGANICS (mg/1 or ppm)

Endr in	NONE	Organohalide	NONE
Methoxychlor		Mercaptans	"
Toxaphene			
2, 4-5			
2,4,5-T			
Phenol(ics)			
PCBs			
Dioxin			
TOC			

PHYSICAL DESCRIPTION

Physical State: [X] Liquid [ ] Semi-solid [ ] Solid
Phases/Layering: [X] Uni-Layer [ ] Bilayer [ ] Multilayer
Viscosity: [ ] High [ ] Medium [X] Low
Type of Solids: N/A [ ] Organic [ ] Inorganic [ ] Mixed
Total Solids (wt. %): <2% Suspended Solids (wt. %): _____
BTU/lb 15-16000 Ash Content 2-5 % Water (by weight) NONE
Flash Point (°F) 140 Type PMCC
Specific Gravity 0.954
Boiling Point, (°C) 153 Freezing Point, (°C) -61°
Vapor Pressure (mm Hg @ 24°C) N/A
pH (Avg) 7 (Range) 7 to _____
Total Alkalinity/Acidity (%) N/A
Odor: mild
Color: clear

HAZARDOUS PROPERTIES

[ ] NONE
[ ] Water Reactive [ ] Reactive [ ] Explosive
[ ] Shock Sensitive [ ] Pyrophoric [ ] Polymriable
[ ] Radioactive [ ] Pesticide Residuals [X] Ignitable
[ ] Corrotive [X] Toxic Vapor [ ] Pathogen
[ ] Biological [ ] Etiological
[ ] Other _____

REQUIRED PERSONNEL PROTECTIVE EQUIPMENT AND PROCEDURES:

STANDARD.

PLEASE ATTACH ALL MATERIAL SAFETY DATA SHEETS, LOGISTIC SKETCHES, ANALYSIS REPORTS, HANDLING PRECAUTIONS, ADDITIONAL HAZARD SUPPORT INFORMATION, DATA & COMMENTS.

CERTIFICATION: I hereby certify that the above and attached description is complete and accurate to the best of my knowledge and ability to determine, that no deliberate or willful omission of composition or properties exists, and that all known or suspected hazards have been disclosed. I certify that the materials tested are representative of all the materials subject to the contract.

DATE 10/21/88 GENERATOR'S SIGNATURE: _____

MSP FORM 1040 (REV. JUNE/87)

MATERIALS CHARACTERIZATION DATA SHEET

MCDS Document # 880 8405

MSP CODE: _____

Generator Name: Palmer Warehouse
Facility Address: 1040 Lockwood Dr.
Houston TX 77020
c/o McHeat INC
City, State, Zip: _____
Technical Contact: EDWIN SEDA / [illegible]
Title: Operations Manager / EXE. SEC.
Telephone NO. (713) 673 9084 EXT: _____
Facility EPA ID #: TXP 440102612

Bill To: McHEAT INC. Box 721945 Houston Tx 77
Company Contact: Bijhan Nadir
Contanier Size: 55 gal
EPA Waste No.: non regulated
Generating Process: unused
Common Name of Waste: —
Rate of Generation: _____ (Quan) _____ (Units) PER _____ (Time Interval)
Volume in Storage: 5 (Quan) (Units) IN 55 gal (Container Size and Type)
Is Waste DOT Hazardous [X] YES [ ] NO
Proper DOT Shipping Name: waste poison B liquid N
Hazard Class: P ID No.: UN2810
Transportation Equipment: UAN
Placarding: P

CHEMICAL COMPOSITION (No Trade Name)

(Totals must add up to 100%)

paraformaldehyde	10 %
water	90 %
	%
	%
	%
	%
	%

METALS (EP Toxicity Test, mg/1)

Arsenic (As)	NONE	Silver (Ag)	NONE
Barium (Ba)	↓	Copper (Cu)	↓
Cadmium (Cd)	↓	Nickel (Ni)	↓
Chromium (cr)	↓	Zinc (Zn)	↓
Lead (Pb)	↓		↓
Mercury (Hg)	↓		
Selenium (Se)	↓		

INORGANICS (mg/1 or ppm)

Total CN	NONE	Iodine	NONE
Free CN	↓	Asbestos	"
Sulfide	↓		
Chloride	↓		
Bisulfite	↓		
Sulfite	↓		
Sulfate	↓		
Phosphate	↓		
Flourine	↓		
Bromine	↓		
Chlorine	↓		

ORGANICS (mg/1 or ppm)

Endr in	NONE	Organohalide	NONE
Methoxychlor	↓	Mercaptans	↓
Toxaphene	↓		
2, 4-5	↓		
2,4,5-T	↓		
Phenol(ics)	↓		
PCBs	↓		
Dioxin	↓		
TOC	↓		

PHYSICAL DESCRIPTION

Physical State	[X] Liquid	[ ] Semi-solid	[ ] Solid
Phases/Layering	[ ] Uni-Layer	[X] Bilayer	[ ] Multilayer
Viscosity	[ ] High	[ ] Medium	[X] Low
Type of Solids	[X] Organic	[ ] Inorganic	[ ] Mixed

Total Solids (wt. %): 10 Suspended Solids (wt. %): ?
BTU/lb <1000 % Ash Content 2.5 % Water (by weight) _____
Flash Point (°F): >300° Type _____
Specific Gravity: 1.1
Boiling Point, (°C): 100 Freezing Point, (°C): 0
Vapor Pressure (mm Hg @ 24°C): 1
pH (Avg): 7 (Range): 7 to _____
Total Alkalinity/Acidity (%): _____
Odor: NONE
Color: milky

HAZARDOUS PROPERTIES

		[ ] NONE
[ ] Water Reactive	[ ] Reactive	[ ] Explosive
[ ] Shock Sensitive	[ ] Pyrophoric	[ ] Polymriable
[ ] Radioactive	[ ] Pesticide Residuals	[ ] Ignitable
[ ] Corrotive	[X] Toxic Vapor	[ ] Pathogen
[ ] Biological	[ ] Etiological	
[ ] Other _____		

REQUIRED PERSONNEL PROTECTIVE EQUIPMENT AND PROCEDURES:

standard

PLEASE ATTACH ALL MATERIAL SAFETY DATA SHEETS, LOGISTIC SKETCHES, ANALYSIS REPORTS, HANDLING PRECAUTIONS, ADDITIONAL HAZARD SUPPORT INFORMATION, DATA & COMMENTS.

CERTIFICATION: I hereby certify that the above and attached description is complete and accurate to the best of my knowledge and ability to determine, that no deliberate or willful omission of composition or properties exists, and that all known or suspected hazards have been disclosed. I certify that the materials tested are representative of all the materials subject to the contract.

DATE 10/21/88 GENERATOR'S SIGNATURE: [signature]

Edwin Seda / [illegible]

MSP FORM 1040 (REV. JUNE/87)

MATERIALS CHARACTERIZATION DATA SHEET

MCDS Document # 870 84104

MSP CODE: _____

Generator Name: Palmer warehouse
Facility Address: 1040 Lockwood Dr.
Houston Tx 77020
c/o moHeat, INC.
City, State, Zip: _____
*Technical Contact: EDWIN SEDA / ISRAEL SANCHEZ
Title: Operations MANAGER / SUPV. SECK.
Telephone NO. (713) 673-9084 EXT: _____
Facility EPA ID #: TXD 980 102 612

Bill To: moHeat INC.
Company Contact: Bijan A. Nader
Contanier Size: 55 gal
EPA Waste No. U240
Generating Process: Unused
Common Name of Waste: 2, 4, D
Rate of Generation: _____ (Quan) 1 (Units) PER _____ (Time Interval)
Volume in Storage: 1 (Quan) (Units) IN 55 (Container Size and Type)
Is Waste DOT Hazardous [X] YES [ ] NO
Proper DOT Shipping Name: 2,4 Dichlorophenoxy Acetic Acid
Hazard Class: Class A ID No. NA 2765
Transportation Equipment: Van
Placarding: _____

CHEMICAL COMPOSITION (No Trade Name)

(Totals must add up to 100%)

2,4 Dichlorophenoxyacetic Acid	80-100	%
WATER	0-20	%
		%
		%
		%
		%
		%

METALS (EP Toxicity Test, mg/1)

Arsenic (As)	NONE	Silver (Ag)	NONE
Barium (Ba)		Copper (Cu)	
Cadmium (Cd)		Nickel (Ni)	
Chromium (cr)		Zinc (Zn)	
Lead (Pb)			
Mercury (Hg)			
Selenium (Se)			

INORGANICS (mg/1 or ppm)

Total CN	NONE	Iodine	NONE
Free CN		Asbestos	
Sulfide			
Chloride			
Bisulfite			
Sulfite			
Sulfate			
Phosphate			
Flourine			
Bromine			
Chlorine			

ORGANICS (mg/1 or ppm)

Endr In	NONE	Organohalide	NONE
Methoxychlor		Mercaptans	
Toxaphene			
2, 4-5-			
2,4,5-T			
Phenol(ics)			
PCBs			
Dioxin			
TOC			

PHYSICAL DESCRIPTION

Physical State: [X] Liquid [ ] Semi-solid [ ] Solid
Phases/Layering: [X] Uni-Layer [ ] Bilayer [ ] Multilayer
Viscosity: [ ] High [ ] Medium [X] Low
Type of Solids: N/A [ ] Organic [ ] Inorganic [ ] Mixed
Total Solids (wt. %): N/A Suspended Solids (wt. %): _____
BTU/lb 10-1700 % Ash Content 2-5 % Water (by weight) 70-20
Flash Point (°F) 140° Type open
Specific Gravity 1.18
Boiling Point, (°C) 120° Freezing Point, (°C) _____
Vapor Pressure (mm Hg @ 24°C) N/A
pH (Avg) 7 (Range) 7 to _____
Total Alkalinity/Acidity (%) _____
Odor: mild
Color: Dk Red to Brown

HAZARDOUS PROPERTIES

[ ] NONE
[ ] Water Reactive [ ] Reactive [ ] Explosive
[ ] Shock Sensitive [ ] Pyrophoric [ ] Polymriable
[ ] Radioactive [X] Pesticide Residuals [X] Ignitable
[ ] Corrotive [X] Toxic Vapor [ ] Pathogen
[ ] Biological [ ] Etiological
[ ] Other _____

REQUIRED PERSONNEL PROTECTIVE EQUIPMENT AND PROCEDURES: Stand.

PLEASE ATTACH ALL MATERIAL SAFETY DATA SHEETS, LOGISTIC SKETCHES, ANALYSIS REPORTS, HANDLING PRECAUTIONS, ADDITIONAL HAZARD SUPPORT INFORMATION, DATA & COMMENTS.

CERTIFICATION: I hereby certify that the above and attached description is complete and accurate to the best of my knowledge and ability to determine, that no deliberate or willful omission of composition or properties exists, and that all known or suspected hazards have been disclosed. I certify that the materials tested are representative of all the materials subject to the contract.

DATE 10/21/88 GENERATOR'S SIGNATURE: [signature]

MSP FORM 1040 (REV. JUNE/87)

MATERIALS CHARACTERIZATION DATA SHEET

MCDS Document # 58084103

MSP CODE: _____

Generator Name: Palmer Warehouse
Facility Address: 1040 Lockwood Dr.
Houston TX 77020
c/o McHeat INC.
City, State, Zip: _____
Technical Contact: EDWIN SEDA / [illegible]
Title: Operations Manager / Exec. Sec.
Telephone NO. (713) 673-4084 EXT: _____
Facility EPA ID #: TXP490026172

Bill To: McHeat INC.
Company Contact: Byron A. Nader
Contanier Size: 55 gal
EPA Waste No.: NONE Regulated
Generating Process: unused
Common Name of Waste: Toxaphene
Rate of Generation _____ (Quan) _____ (Units) PER _____ (Time Interval)
Volume in Storage 27 (Quan) (Units) IN 55 gal (Container Size and Type)
Is Waste DOT Hazardous [X] YES [ ] NO
Proper DOT Shipping Name: Poison B Liquid NOS
Hazard Class: P ID No.: UN2810
Transportation Equipment: CAN
Placarding: _____

CHEMICAL COMPOSITION (No Trade Name)

(Totals must add up to 100%)

Toxaphene	100 %
(Tech chlorinated camphene)	%
	%
	%
	%
	%
	%

METALS (EP Toxicity Test, mg/1)

Arsenic (As)	NONE	Silver (Ag)	NONE
Barium (Ba)	↓	Copper (Cu)	↓
Cadmium (Cd)	↓	Nickel (Ni)	↓
Chromium (cr)	↓	Zinc (Zn)	↓
Lead (Pb)	↓		
Mercury (Hg)	↓		
Selenium (Se)	↓		

INORGANICS (mg/1 or ppm)

Total CN	NONE	Iodine	NONE
Free CN	↓	Asbestos	"
Sulfide	↓		
Chloride	↓		
Bisulfite	↓		
Sulfite	↓		
Sulfate	↓		
Phosphate	↓		
Flourine	↓		
Bromine	↓		
Chlorine	67%		

ORGANICS (mg/1 or ppm)

Endrin	NONE	Organohalide	NONE
Methoxychlor	"	Mercaptans	↓
Toxaphene	100%		↓
2,4-D	NONE		
2,4,5-T	↓		
Phenol(ics)	↓		
PCBs	↓		
Dioxin	↓		
TOC	↓		

PHYSICAL DESCRIPTION

Physical State	[X] Liquid	[ ] Semi-solid	[ ] Solid
Phases/Layering	[X] Uni-Layer	[ ] Bilayer	[ ] Multilayer
Viscosity	[X] High	[ ] Medium	[ ] Low
Type of Solids	[X] Organic	[ ] Inorganic	[ ] Mixed

Total Solids (wt. %) 5 Suspended Solids (wt. %) 1-2
BTU/lb <1000 % Ash Content 50-60 % Water (by weight) _____
Flash Point (°F) >200 Type _____
Specific Gravity _____
Boiling Point, (°C) 150 Freezing Point, (°C) _____
Vapor Pressure (mm Hg @ 24°C) _____
pH (Avg) 7 (Range) 7 to _____
Total Alkalinity/Acidity (%) _____
Odor: mild
Color: Dk Brown

HAZARDOUS PROPERTIES

		[ ] NONE
[ ] Water Reactive	[ ] Reactive	[ ] Explosive
[ ] Shock Sensitive	[ ] Pyrophoric	[ ] Polymriable
[ ] Radioactive	[ ] Pesticide Residuals	[X] Ignitable
[ ] Corrotive	[X] Toxic Vapor	[ ] Pathogen
[ ] Biological	[ ] Etiological	
[ ] Other _____		

REQUIRED PERSONNEL PROTECTIVE EQUIPMENT AND PROCEDURES:

Standard

PLEASE ATTACH ALL MATERIAL SAFETY DATA SHEETS, LOGISTIC SKETCHES, ANALYSIS REPORTS, HANDLING PRECAUTIONS, ADDITIONAL HAZARD SUPPORT INFORMATION, DATA & COMMENTS.

CERTIFICATION: I hereby certify that the above and attached description is complete and accurate to the best of my knowledge and ability to determine, that no deliberate or willful omission of composition or properties exists, and that all known or suspected hazards have been disclosed. I certify that the materials tested are representative of all the materials subject to the contract.

DATE 10/21/88 GENERATOR'S SIGNATURE: [signature]

MSP FORM 1040 (REV. JUNE/87)

MATERIALS CHARACTERIZATION DATA SHEET

MCDS Document # 3808403

MSP CODE: _____

Generator Name: PALMER warehouse
Facility Address: 1040 lockwood Dr.
HOUSTON TX 77020
c/o Mohat INC
City, State, Zip:
Technical Contact: EDWIN SEDIT / [illegible]
Title: operations MANAGER / [illegible]
Telephone NO. (713) 673-9084 EXT:
Facility EPA ID #: TXP4010122617

Bill To: MOHAWT INC. P.O. 721945 HOUSTON 772
Company Contact: Byron Nader
Contanier Size: 55 gl
EPA Waste No.: NONE NRM
Generating Process: UNUSED RESIN
Common Name of Waste: RESIN
Rate of Generation: _____ (Quan) _____ (Units) PER _____ (Time Interval)
Volume in Storage: 4 (Quan) (Units) IN 55 gl (Container Size and Type)
Is Waste DOT Hazardous [ ] YES [X] NO
Proper DOT Shipping Name: N/A
Hazard Class: N/A ID No.: N/A
Transportation Equipment: LAN
Placarding: NONE

CHEMICAL COMPOSITION (No Trade Name)

(Totals must add up to 100%)

Zeolite (Ion exchange Resin)	100 %
	%
	%
	%
	%
	%
	%

METALS (EP Toxicity Test, mg/1)

Arsenic (As)	NONE	Silver (Ag)	NONE
Barium (Ba)		Copper (Cu)	
Cadmium (Cd)		Nickel (Ni)	
Chromium (cr)		Zinc (Zn)	✓
Lead (Pb)			
Mercury (Hg)			
Selenium (Se)	✓		

INORGANICS (mg/1 or ppm)

Total CN	NONE	Iodine	NONE
Free CN		Asbestos	✓
Sulfide			
Chloride			
Bisulfite			
Sulfite			
Sulfate			
Phosphate			
Flourine			
Bromine			
Chlorine	✓		

ORGANICS (mg/1 or ppm)

Endr in	NONE	Organohalide	NONE
Methoxychlor		Mercaptans	✓
Toxaphene			
2, 4-5,			
2,4,5-T			
Phenol(ics)			
PCBs	✓		
Dioxin			
TOC	✓		

PHYSICAL DESCRIPTION

Physical State	[ ] Liquid	[ ] Semi-solid	[X] Solid
Phases/Layering	[ ] Uni-Layer	[ ] Bilayer	[ ] Multilayer
Viscosity	[ ] High	[ ] Medium	[ ] Low
Type of Solids	[ ] Organic	[X] Inorganic	[ ] Mixed

Total Solids (wt. %): 100 Suspended Solids (wt. %): _____
BTU/lb 2100 % Ash Content 100 % Water (by weight) NONE
Flash Point (°F) > 300 Type _____
Specific Gravity 1.8
Boiling Point, (°C) N/A Freezing Point, (°C) _____
Vapor Pressure (mm Hg @ 24°C) N/A
pH (Avg) 7 (Range) _____ to _____
Total Alkalinity/Acidity (%) _____
Odor: NONE
Color: BLACK

HAZARDOUS PROPERTIES

[X] NONE

[ ] Water Reactive	[ ] Reactive	[ ] Explosive
[ ] Shock Sensitive	[ ] Pyrophoric	[ ] Polymriable
[ ] Radioactive	[ ] Pesticide Residuals	[ ] Ignitable
[ ] Corrotive	[ ] Toxic Vapor	[ ] Pathogen
[ ] Biological	[ ] Etiological	
[ ] Other		

REQUIRED PERSONNEL PROTECTIVE EQUIPMENT AND PROCEDURES:

NON haz.

PLEASE ATTACH ALL MATERIAL SAFETY DATA SHEETS, LOGISTIC SKETCHES, ANALYSIS REPORTS, HANDLING PRECAUTIONS, ADDITIONAL HAZARD SUPPORT INFORMATION, DATA & COMMENTS.

CERTIFICATION: I hereby certify that the above and attached description is complete and accurate to the best of my knowledge and ability to determine, that no deliberate or willful omission of composition or properties exists, and that all known or suspected hazards have been disclosed. I certify that the materials tested are representative of all the materials subject to the contract.

DATE 10/21/88 GENERATOR'S SIGNATURE: [signature]

[signature] / Mdz

MSP FORM 1040 (REV. JUNE/87)

MATERIALS CHARACTERIZATION DATA SHEET

MCDS Document # RYO 8401

MSP CODE: _____

Generator Name: PALMER warehouse
Facility Address: 1040 Lockwood Dr.
Houston TX 77020
c/o McHeat INC
City, State, Zip: _____
Technical Contact: EDWIN SEDA / BRENDA SANDERS
Title: Operations Manager / EXT. SECR.
Telephone NO. (713) 673 9084 EXT: _____
Facility EPA ID #: TXP490102612

Bill To: McHeat INC.
Company Contact: Sylvia A Nadir
Contanier Size: 55 gal
EPA Waste No.: NONE
Generating Process: unused surfactant
Common Name of Waste: Aerosol A268
Rate of Generation: _____ (Quan) _____ (Units) PER _____ (Time Interval)
Volume in Storage: 14 (Quan) (Units) IN 55 gal (Container Size and Type)
Is Waste DOT Hazardous [ ] YES [X] NO
Proper DOT Shipping Name: Non Reg
Hazard Class: _____ ID No.: _____
Transportation Equipment: VAN
Placarding: _____

CHEMICAL COMPOSITION (No Trade Name)

(Totals must add up to 100%)

Disodium isodecyl sulfosuccinate	100 %
(Aerosol) A268	%
American cyanamide surfactant	%
	%
	%
	%
	%

METALS (EP Toxicity Test, mg/1)

Arsenic (As)	NONE	Silver (Ag)	NONE
Barium (Ba)		Copper (Cu)	
Cadmium (Cd)		Nickel (Ni)	
Chromium (cr)		Zinc (Zn)	
Lead (Pb)			
Mercury (Hg)			
Selenium (Se)			

INORGANICS (mg/1 or ppm)

Total CN	NONE	Iodine	NONE
Free CN		Asbestos	NONE
Sulfide			
Chloride			
Bisulfite			
Sulfite			
Sulfate			
Phosphate			
Flourine			
Bromine			
Chlorine			

ORGANICS (mg/1 or ppm)

Endr in	NONE	Organohalide	NONE
Methoxychlor		Mercaptans	NONE
Toxaphene			
2, 4-5			
2,4,5-T			
Phenol(ics)			
PCBs			
Dioxin			
TOC.			

PHYSICAL DESCRIPTION

Physical State	[X] Liquid	[ ] Semi-solid	[ ] Solid
Phases/Layering	[ ] Uni-Layer	[X] Bilayer	[ ] Multilayer
Viscosity	[ ] High	[X] Medium	[ ] Low
Type of Solids N/A	[ ] Organic	[ ] Inorganic	[ ] Mixed

Total Solids (wt. %): N/A Suspended Solids (wt. %): _____
BTU/lb 12-14000 % Ash Content 2-5 % Water (by weight) ?
Flash Point (°F) > 200° Type open
Specific Gravity 1.2
Boiling Point, (°C): _____ Freezing Point, (°C): _____
Vapor Pressure (mm Hg @ 24°C): _____
pH (Avg) 7 (Range) 7 to 7
Total Alkalinity/Acidity (%): _____
Odor: mild
Color: Clear

HAZARDOUS PROPERTIES

[ ] NONE

[ ] Water Reactive	[ ] Reactive	[ ] Explosive
[ ] Shock Sensitive	[ ] Pyrophoric	[ ] Polymriable
[ ] Radioactive	[ ] Pesticide Residuals	[X] Ignitable
[ ] Corrotive	[ ] Toxic Vapor	[ ] Pathogen
[ ] Biological	[ ] Etiological	

[ ] Other: _____

REQUIRED PERSONNEL PROTECTIVE EQUIPMENT AND PROCEDURES: Standard

PLEASE ATTACH ALL MATERIAL SAFETY DATA SHEETS, LOGISTIC SKETCHES, ANALYSIS REPORTS, HANDLING PRECAUTIONS, ADDITIONAL HAZARD SUPPORT INFORMATION, DATA & COMMENTS.

CERTIFICATION: I hereby certify that the above and attached description is complete and accurate to the best of my knowledge and ability to determine, that no deliberate or willful omission of composition or properties exists, and that all known or suspected hazards have been disclosed. I certify that the materials tested are representative of all the materials subject to the contract.

DATE 10/21/88 GENERATOR'S SIGNATURE: _____

MSP FORM 1040 (REV. JUNE/87)

REF 07

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VI
1445 ROSS AVENUE, SUITE 1200
DALLAS, TEXAS 75202

REPLY TO 6E-EI

MEMORANDUM

SUBJECT: ACTION MEMORANDUM
Request for Removal Action at the Palmer Warehouse Site, Houston, Harris County, Texas
CERCLIS # TXD 006806582
Site ID # K1
Category of Removal: Time Critical

FROM: Patrick L. Hammack
On-Scene Coordinator
Site Investigation/Emergency Response Section (6E-EI)

TO: Robert E. Layton Jr., P.E.
Regional Administrator (6A)

THRU: Russell F. Rhoades
Director
Environmental Services Division (6E)

I. PURPOSE

This memorandum requests approval for a Removal Action pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA) at the Palmer Warehouse Site. The purpose of the action is to remove drums containing various hazardous substances abandoned in an active warehouse.

This action meets the criteria for initiating a removal action under Section 300.65 of the National Contingency Plan (NCP) and is anticipated to require less than twelve months and under $2 million for completion.

II. BACKGROUND

A. Site Description:

The Palmer Warehouse at 1046 Lockwood, Houston, Texas is the site of abandoned substances drums along with photographic and printing chemicals stored for SCI Equipment and Technology (SCI), a company which is now defunct. The warehouse is located in a predominantly residential district. Located in a one mile radius of the site are three public

T654200013

parks, a hospital and approximately 8,000 residents (Attachment 1). The Palmer Warehouse Company, along with its subsidiary, Palmer-Pack Co., Inc. operates five warehouses. The Palmer Warehouse operates as a full distribution warehouse storing a variety of commodities for various clients, while Palmer-Pack Co., Inc. is involved in the packaging of polyproplene and polyethylene products, some of which have been stored in the same warehouse as the SCI stored waste chemicals and photographic or printing material.

On December 19, 1984 Anchor/Lithkemko sold photographic and printing material to Signo Crating, a sister company of SCI, out of Mt. Vernon, New York. The product consisted of 510 pieces and was shipped on 26 skids to the Palmer Warehouse for storage. The bill of lading indicates the product was packaged in cases, drums and pails and weighed 32,582 pounds.

On March 29, 1985, 19 drums of acetaldehyde and 5 drums of formaldehyde were transported to the Palmer warehouse on Kress Street. The material has since been moved and is currently stored at the 1046 Lockwood warehouse. According to Palmer, 63 drums of material is associated with SCI stored shipments. The 39 remaining drums consist of 14 drums of alpha methyl styrene, 13 drums of non-hazardous Aerosol A268 product, and 12 drums of unidentified chemical content. A listing of materials and original shippers inventoried at the Palmer warehouse is in Attachment 1.

SCI and its associated companies were owned by the Colbert brothers, Jack and Charles, and were involved in the purchase of off specification and waste chemicals for export. SCI materials were stored in warehouses and frequently abandoned according to records in other EPA Regional offices. The Colbert brothers have been convicted on various counts of fraud and are serving sentences in the Otisville Federal Correctional Institute in New York.

The Palmer Warehouse is an active business and does not appear on the National Priority List.

B. Incident Characteristics:

The circumstances surrounding the insolvency of SCI resulted in the Colbert brothers no longer being a viable responsible party. The condition of the stored SCI material continues to deteriorate. Of the 63-drum total, 25 are rusting, 4 are dented and 3 are bulging. These drums contain acetaldehyde, formaldehyde and alpha methyl styrene. All three of these chemicals are toxic and each of the chemicals is either flammable, explosive or combustible. In addition formaldehyde is a carcinogen. There are also 12 drums of unknown chemical content and, therefore, present unknown hazards.

Much of the photographic and printing material being stored for SCI contains hazardous constituents including cyanide. Some of the product leaked and Palmer personnel placed it in overpack drums when discovered. Inventoried material that was damaged and leaking contained constituents such as potassium ferrocyanide, chrome alum, phosphoric acid, ammonium bichromate and ammonium hydroxide. One bulged drum is known to contain combustible materials such as hexane and isopropyl alcohol.

C. Quantity and Types of Substances Present:

The inventory of materials attached indicates the quantity and types of substances present at the Palmer warehouse. Acetaldehyde, formaldehyde and alpha methyl styrene have Threshold Limit Values (TLV's) of 100 ppm, 1 ppm, and 50 ppm respectively. Leaking and damaged photographic and printing material contains constituents as noted in section B which carry TLV's ranging from 0.05 ppm for ammonium bichromate to 400 ppm for isopropyl alcohol.

D. State and Local Authorities Roles:

On January 29, 1988, the Texas Water Commission accompanied the EPA Houston RCRA inspectors on an inspection of the Palmer Warehouse facility (see Other Actions to Date). The Texas Water Commission has expressed an interest in the site but is not maintaining an active file on this facility due to higher priority actions and limited resources.

E. Other Actions to Date:

As a result of the investigation into the illegal activities conducted by the companies run by Jack and Charles Colbert, the EPA Houston RCRA inspectors conducted an inspection of the warehouse on January 29, 1988. A copy of the SCI file data was obtained and an inventory of the stored material for SCI was provided by Palmer Warehouse. Because the materials in the warehouse are claimed to be product and RCRA only regulates waste, they turned the case over to Emergency Response for evaluation of removal potential.

III. THREAT TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT

A. Threats to Public Health or Welfare:

This site presents a threat to human health due to the deteriorating condition of drums containing hazardous chemicals. Releases of acetaldehyde, formaldehyde, alpha methyl styrene or the constituents ammonium bichromate, potassium ferrocyanide, chromic chloride, chrome alum, phosphoric acid, and sulfuric acid would result in direct contact and inhalation problems. The TLV's range from 0.05 ppm for ammonium bichromate to 400 ppm for isopropyl alcohol. The SCI material is stored in an active warehouse where workers are potentially exposed to toxic, flammable, explosive, and carcinogenic materials.

Many of the materials stored present uncontrolled exposure routes that include direct contact, ingestion, and inhalation. The site assessment identified numerous hazardous and carcinogenic chemicals present in the stored material (Attachment 2).

The deteriorating condition of the drums and other containers poses a fire or explosion hazard which threatens the surrounding population. The area to the northwest and northeast of the Palmer warehouse is primarily residential. Three public parks and one hospital lie within a one mile radius of the facility. No other response mechanisms exist to respond to the above described threats in a timely manner.

B. Threats to the Environment:

A release of these materials would contaminate the surrounding soil, water, and drainage area. An air release, possibly from a fire, would result in a much greater extent of contamination of the surrounding air, soil, water, and vegetation.

IV. ENFORCEMENT

See Attachment 3.

V. PROPOSED ACTIONS AND COST

A. Proposed Actions:

The objective of the action is to mitigate the immediate threat to the warehouse employees and the surrounding neighborhood by removing and properly disposing of the hazardous materials.

A removal action is planned where the drums will be sampled, overpacked and secured awaiting an acceptable disposal facility. Any other action would delay the inevitable solution of removal and disposal. There are no long term remedial plans for this site.

SUMMARY OF COSTS

Extramural Costs

ERCS Cleanup Contractor	$378,500
TAT Costs	$ 23,500
CLP Costs	$ 0
ERT Costs	$ 0
Subtotal Extramural Direct Cost	$402,000
15% Contingency of Above Cost	$ 60,000

Total Extramural Costs.....$462,000

Intramural Costs

Intramural Direct Costs.....$ 13,000

Intramural Indirect Costs.....$ 19,000

Total Intramural Costs.....$ 32,000

Total Removal Project Ceiling Estimate.....$494,000

B. Alternative Action and Costs:

Because of the condition of the drums and other containers, the only reasonable solution is removal and disposal. The alternative actions pertain only to the type of disposal required for the drums. Incineration would totally remove the threat caused by the material. However, the cost of solidification and landfilling is much less. The decision of what method of disposal to use can not be determined until the waste are sampled and a waste profile is developed for disposal.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD NO ACTION BE TAKEN OR ACTION BE DELAYED

Without further attention, the containers will continue to deteriorate. If this is allowed, the health and welfare of the area residents and warehouse employees will be endangered. If the materials are inadvertently allowed to mix with one another, a fire and explosion danger to the local citizens would result. If some of these materials were mixed, cyanide could be released causing an immediate threat to the warehouse employees and surrounding neighborhood.

If a removal is not conducted soon, it is likely that a removal would have to be conducted under emergency conditions. Cyanide producing chemicals are involved in this removal. The more time these chemicals are allowed to decay their containers, the greater the probability for the liberation and release of the cyanide to the atmosphere with detrimental health effects.

VII. IMPORTANT POLICY ISSUES

Not Applicable

VIII. RECOMMENDATION

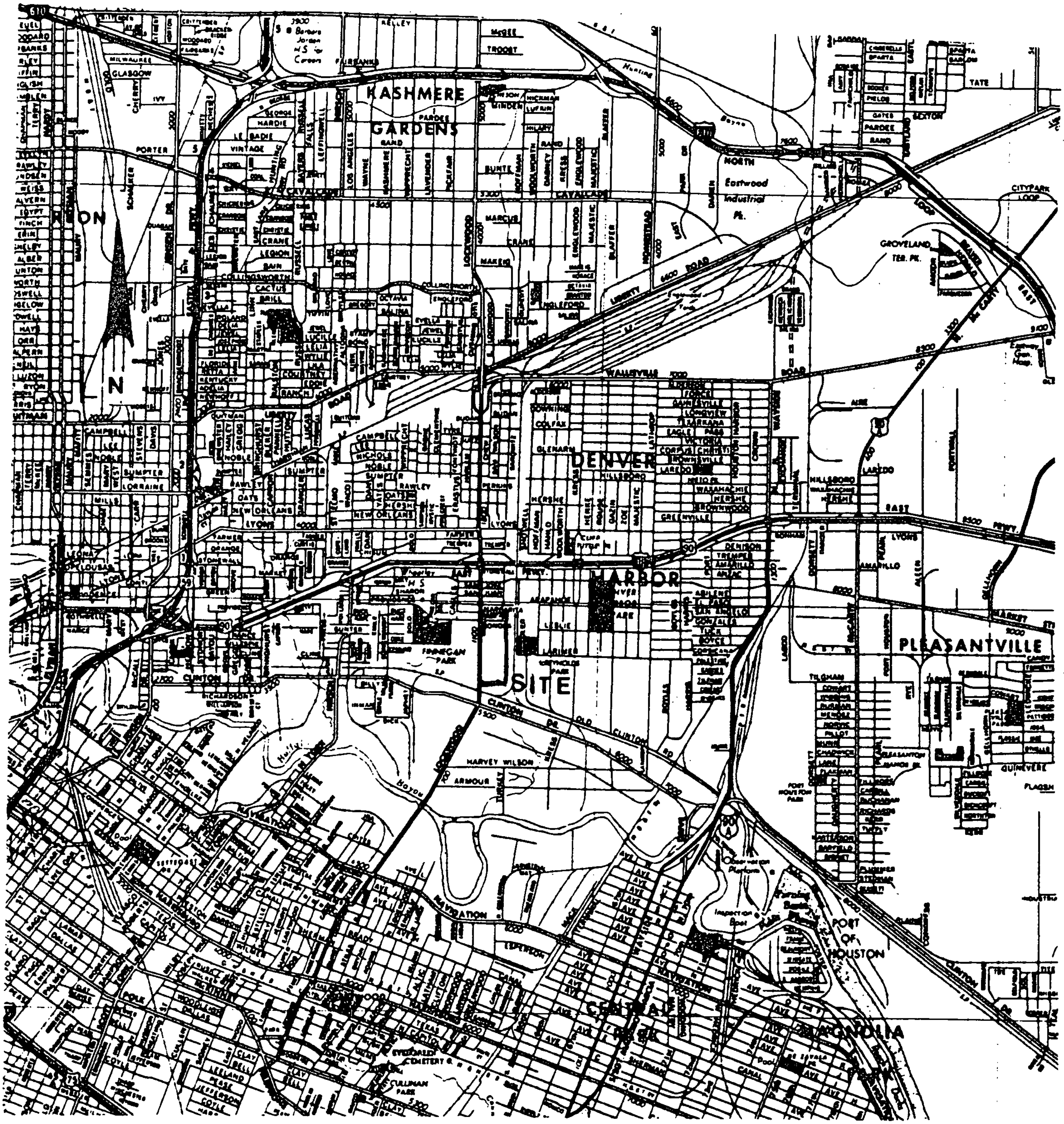
Because conditions at the site meet the NCP section 300.65 (b) (2) criteria for a removal, I recommend your approval of the proposed removal action. The estimated total project costs are $494,000 of which $462,000 are for extramural cleanup contractor costs. You may indicate your approval or disapproval by signing below.

APPROVE: Robert D. Feyt Jr DATE: 6-22-88

DISAPPROVE: _____ DATE: _____

Attachments

ATTACHMENT 1
AREA MAP



ATTACHMENT -

SCI DRUM INVENTORY

(63 Drums)

1.	Acetaldehyde	Rusted
2.	Acetaldehyde	Rusted, Bulge near drum cap
3.	Alpha Methyl Styrene*	Rusted, Overpacked
4.	Alpha Methyl Styrene	Spout-type cap with bulge
5.	Aerosol A268	Overpacked fiber drum
6.	Aerosol A268	Overpacked fiber drum
7.	Acetaldehyde	Rusted
8.	Alpha Methyl Styrene	Spout-type cap with bulge
9.	Alpha Methyl Styrene	Rusted, Dented
10.	Aerosol A268	Overpacked fiber drum
11.	Aerosol A268	Overpacked fiber drum
12.	Unknown: Marked MVO-Trebacher***	Ring top
13.	Acetaldehyde	
14	Acetaldehyde	Rusted
15.	Acetaldehyde	Rusted
16.	Acetaldehyde	Rusted
17.	Pyramid Chemical: DMF Adhesive	
18.	Alpha Methyl Styrene	
19.	Alpha Methyl Styrene	
20.	Formaldehyde** No Visible Markings (On Western Co. Skid)	Rusted
21.	Acetaldehyde	Rusted
22.	Acetaldehyde	Rusted, Dented
23.	Formaldehyde** No Visible Markings (On Western Co. Skid)	Rusted
24.	Acetaldehyde	Rusted, Dented
25.	Alpha Methyl Styrene	
26.	Alpha Methyl Styrene*	Rusted top and side, Dented
27.	Acetaldehyde	Rusted
28.	Acetaldehyde	Rusted
29.	Acetaldehyde	Rusted
30.	Formaldehyde** No Visible Markings (On Western Co. Skid)	Rusted
31.	Alpha Methyl Styrene	
32.	Alpha Methyl Styrene	
33.	Acetaldehyde	Rusted
34.	Acetaldehyde	
35.	Abmostat - 810	Ring top
36.	Formaldehyde** Western Co. Marking (On Western Co. Skid)	Rusted
37.	Acetaldehyde	Rusted
38.	Acetaldehyde	Rusted
39.	Acetaldehyde	Rusted
40.	Abmostat - 810	Ring top
41.	Aerosol A268	Overpacked fiber
42.	Acetaldehyde	Rusted
43.	Formaldehyde** Western Co. Marking (On Western Co. Skid)	Rusted

44.	Alpha Methyl Styrene*	Bulged top
45.	Alpha Methyl Styrene*	
46.	Alpha Methyl Styrene	
47.	Alpha Methyl Styrene	
48.	Aerosol A268	
49.	Aerosol A268	Stored near south wall between
50.	Aerosol A268	double garage doors
51.	Aerosol A268	
52.	Diamond Shamrock	Overpacked short fiber drum in open 55-gal. metal drum
53.	Aerosol A268	Overpacked fiber drum
54.	Aerosol A268	Overpacked fiber drum
55.	Aerosol A268	Overpacked fiber drum
56.	Aerosol A268	Overpacked fiber drum
57.	Sun Co. Weed Killer (No Visible Markings, identified by Palmer on 5-20-88)	
58.	Salvage - 80 Gallon Drum	
59.	Salvage - 80 Gallon Drum	
60.	Salvage - 80 Gallon Drum	Ring top
61.	Diamond Shamrock	Short fiber drum
62.	Diamond Shamrock	Short fiber drum, Stained
63.	Salvage - 80Gallon Drum	

* Assumed - No Visible Marking
Located on Chemcentral Skid
14-Drum Total - Agrees w/EPA 1-29-88 Inventory

**Formaldehyde - No Visible Marking Except for The Western Co. on #36, #43)
5-Drum Total - Agrees w/EPA 1-29-88 Inventory

***MVO-Trebacher Drum was not on EPA 1-29-88 Inventory

SUMMARY 63-DRUM TOTAL

Acetaldehyde		19 Drums
Formaldehyde		5 Drums
Alfa Methyl Styrene		14 Drums
Aerosol A268		13 Drums
Abmistat 810		2 Drums
Diamond Shamrock:	Unknown	3 Drums
Pyramid Chemical:	DMF Adhesive	1 Drum
Sun Oil:	Weed Killer	1 Drum
Unknown:	Marked MVO-Trebacher	1 Drum
Salvage		4 Drums

SUMMARY OF PHOTOGRAPHIC MATERIALS

9 Drums		Asphaltum Gum Etch Finisher
8 Cases	4 Gal. Each	Dispatch Black Lacquer Developer
12 Cases	4-1 Gal	D'Glaze It
6 Cases	12 Qt. Bottles	Elektrostat (Potassium Ferro Cyanide)
12 Cases	4-1 Gal	Black Bristle Lacquer Developer
1 Case	4-1 Gal	Ultra Kem (Acid, No Cyanide)
32Cases		Professional Universal Fountain Concentrate (Clea
9 Cases	4-1 Gal	Pure Gum Arabic
6 Cases	4-1 Gal	Ultra Kem (5 Damaged, 4 are Leaking)
64 Cases	4-1 Gal	D'Glaze It
2 Boxes		Black to Yellow B-T-Y #1 Quick Color Wash
3 Pails		Elektra Electrostatic Etch
1 Case	4-1 Gal	Super Sensitizer Coating
1 Case		Dispatcher Black Lacquer Developer
2 Cases	4-1 Gal	Big Red Machine Lacquer Developer
7 Cases		Lithographic Chemical Preparation - Cleaning Sol
9 Cases	4-1 Gal	Kem Guard (Acid Soln.)
18 Cases	4-1 Gal	Dispatch Black Lacquer Developer (Acid)
20 Cases	4-1 Gal	Electra Electrostatic Etch (Cyanide)
35 Cases	4-1 Gal	Tray Cleaner (Dichromate)
11 Cases	4-1 Gal	Electrostat Etch (Potassium Ferro Cyanide)
2 Cases	4-1 Gal	Dispatch Black Lacquer Developer
19 Cases	5-Gal	Electra Electrostatic Etch

Attachment 3
Enforcement Analysis
Palmer Warehouse Site

The owner of the property has been identified through a special warranty deed as Houston-St. Louis Properties, Ltd., a partnership comprised of the New England Mutual Life company and George A. Shutt. The warehouse is managed by the Trammell Crow Company of Houston and is leased to Palmer Warehouse & Transfer Company Inc.. This has been verified with a lease agreement.

An Administrative Order has been drafted based on information collected to date, and will be issued unilaterally to the owner and the operator.

RECORD OF COMMUNICATION	(Record of Item Checked Below) _x_Phone Call ___Discussion ___Field Trip ___Conference ___Other(Specify) Reference 08	
TO: Don McInnes Houston Public Works, Water Prouduction office (713) 227-6558	From: Kelly Bowles FIT Geologist Kelly Bowles	Date: 1/5/89 Time: 1:00 p.m.

SUBJECT Groundwater and surface water use in the City of Houston.

SUMMARY OF COMMUNICATION

A. Where does the public water supply for the study area in the City of Houston come from?

B. Drinking water for that area is a mixture of surface water and groundwater. Surface water comes from Lake Houston, 17 miles north. Groundwater comes from City of Houston water supply wells, 4 of which are located within 4 miles of your area of concern. Central #19, Central #20, Central #21 and Scott Street #6. Approximately 60% comes from surface water and 40% from groundwater. (See attachment.)

Q. What are the uses of Buffalo Bayou?

A. Buffalo Bayou is primarily a storm sewer outlet with limited recreational uses, such as canoeing. There is no surface water withdrawal from Buffalo Bayou for public water supply use in the City of Houston. It not used for irrigation either.

*105 Sabine

Houston, Texas

CONCLUSIONS, ACTION TAKEN OR REQUIRED

INFORMATION COPIES
TO:

EPA FORM 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 which may be used until Supply is Exhausted.

ATTACHMENT TO REFERENCE 08

			Surface Casing	First Screen	I.D.
Central #18	not active	27 Artesial			
Central #19		715 Gillette	627	1160	1978
Central #20		901 Sawyer	601	1015	1920
Cemtral #21		1901 Memorial Drive	606	747	1985
Northeast #1	Plugged	3400 Delia			
Northeast #2	Plugged	3400 Delia			
Northeast #3	Plugged	3156 Crane			
Scott St.		3346 Scott	571	580	2100

TARGET SHEET

SITE NAME: PALMER PACK WAREHOUSE

CERCLIS I.D.: TXD006806582

TITLE OF DOC.: REFERENCE 9 TO THE PRELIMINARY ASSESSMENT REPORT

DATE OF DOC.: 03/21/1989

NO. OF PGS. THIS TARGET SHEET REPLACES: UNK

SDMS #: 9490052 **RELATED #:**

SENSITIVE ?		MISSING PAGES ?	X
ALTERN. MEDIA ?		CROSS REFERENCE ?	

LAB DOCUMENT ?		LAB NAME:	
ASC./BOX #:			
CASE #:		SDG #:	

COMMENTS : REFERENCE 9 TO THE PRELIMINARY ASSESSMENT REPORT WAS NOT LOCATED IN THE FILE.

PHC80-2-184

Census Tracts

HOUSTON, TEX.

STANDARD METROPOLITAN STATISTICAL AREA

Section 1 of 2

REF. 10

1980

Census of Population and Housing

U.S. Department of Commerce
BUREAU OF THE CENSUS

1980

Census of Population and Housing

Census Tracts

HOUSTON, TEX.

STANDARD METROPOLITAN STATISTICAL AREA

PHC80-2-184

Section 1: Tables P-1—P-17

Issued July 1983

U.S. Department of Commerce
Malcolm Baldrige, Secretary
Robert G. Dederick,
Under Secretary for Economic Affairs

BUREAU OF THE CENSUS
Bruce Chapman, Director

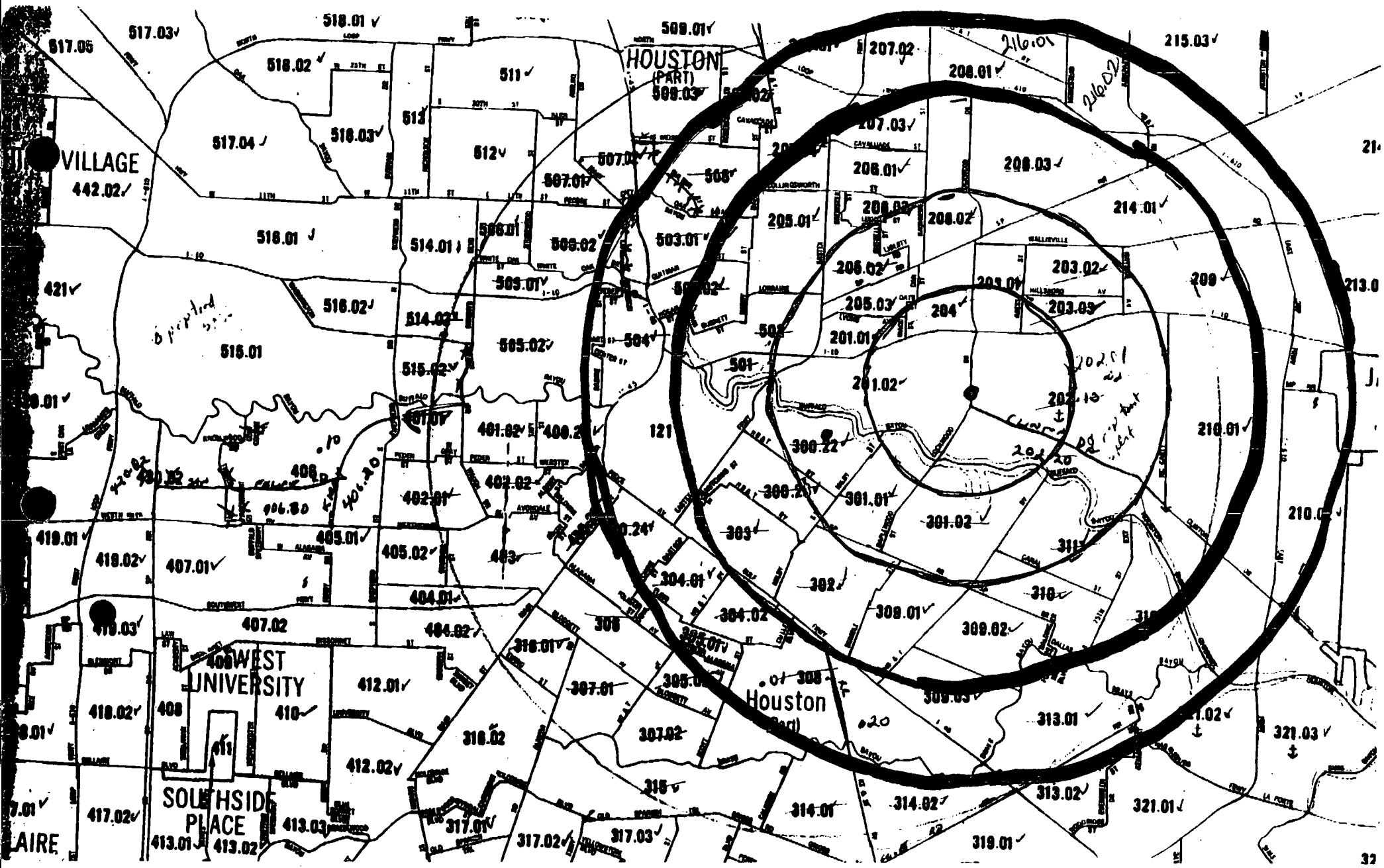

HOUSTON
(PART)
VILLAGE
WEST
UNIVERSITY
SOUTHSIDE
PLACE
Houston
(Part)
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Table P-1. **General Characteristics of Persons: 1980**—Con.

[For meaning of symbols, see introduction. For definitions of terms, see appendixes A and B]

Census Tracts	Cloverleaf (CDP), Harris County		Deer Park city, Harris County					Friendswood city (pt.), Harris County	Houston city (pt.), Harris County			
	Tract 0230.01*	Tract 0230.04*	Tract 0360.01	Tract 0360.02	Tract 0360.03*	Tract 0360.04*	Tract 0361*	Tract 0375*	Tract 0121	Tract 0201.01	Tract 0201.02	Tract 0202
AGE												
Total persons	**7 932**	**9 385**	**4 587**	**8 343**	**5 221**	**4 497**	-	-	**2 145**	**3 385**	**5 137**	**8 186**
Under 5 years	568	864	437	642	564	406	-	-	54	257	524	888
5 to 9 years	713	849	453	830	610	436	-	-	51	279	548	865
10 to 14 years	745	722	481	927	520	477	-	-	48	317	473	954
15 to 19 years	800	948	358	914	445	470	-	-	170	363	545	904
20 to 24 years	787	1 151	298	574	398	451	-	-	267	309	496	854
25 to 34 years	1 546	1 614	1 001	1 497	1 279	847	-	-	502	375	659	1 226
35 to 44 years	1 315	1 111	689	1 362	763	627	-	-	302	263	412	762
45 to 54 years	814	967	448	896	396	446	-	-	279	359	421	701
55 to 64 years	401	690	219	515	174	232	-	-	250	350	422	614
65 to 74 years	198	352	95	139	55	77	-	-	154	296	410	378
75 years and over	45	117	108	47	17	28	-	-	58	207	227	140
3 and 4 years	272	348	183	294	226	160	-	-	19	107	208	361
16 years and over	5 652	6 781	3 136	5 736	3 426	3 081	-	-	1 975	2 443	3 477	5 405
18 years and over	5 328	6 426	2 971	5 338	3 237	2 881	-	-	1 932	2 293	3 277	5 045
21 years and over	4 851	5 760	2 822	4 899	3 032	2 613	-	-	1 751	2 096	2 940	4 504
60 years and over	280	739	288	353	137	187	-	-	330	662	842	798
62 years and over	213	607	248	273	110	147	-	-	283	584	756	665
Median	26.6	25.7	27.9	27.4	25.5	25.1	-	-	34.3	28.3	24.8	23.5
Female	**4 002**	**4 594**	**2 281**	**4 159**	**2 541**	**2 215**	-	-	**552**	**1 864**	**2 766**	**3 897**
Under 5 years	323	428	221	309	262	204	-	-	25	132	248	437
5 to 9 years	353	423	212	378	274	218	-	-	23	117	263	412
10 to 14 years	365	356	229	453	264	225	-	-	23	165	231	421
15 to 19 years	410	484	166	454	229	233	-	-	35	196	249	404
20 to 24 years	405	531	158	290	204	222	-	-	55	152	285	365
25 to 34 years	817	736	504	902	543	414	-	-	108	214	379	560
35 to 44 years	565	563	338	673	352	321	-	-	85	164	246	372
45 to 54 years	387	467	205	454	189	216	-	-	73	214	249	335
55 to 64 years	186	330	101	233	86	99	-	-	70	219	252	318
65 to 74 years	58	196	65	80	27	45	-	-	53	162	249	195
75 years and over	33	80	82	33	11	18	-	-	22	129	115	78
3 and 4 years	129	174	91	143	107	81	-	-	9	56	101	184
16 years and over	2 884	3 309	1 580	2 912	1 695	1 519	-	-	474	1 412	1 966	2 544
18 years and over	2 708	3 119	1 503	2 730	1 602	1 428	-	-	466	1 327	1 885	2 377
21 years and over	2 477	2 776	1 439	2 501	1 485	1 287	-	-	438	1 218	1 711	2 154
60 years and over	153	408	188	196	73	97	-	-	105	397	492	424
62 years and over	125	340	166	168	63	76	-	-	92	350	437	357
Median	26.7	25.8	28.2	27.9	25.5	25.1	-	-	35.8	32.6	27.2	23.7
HOUSEHOLD TYPE AND RELATIONSHIP												
Total persons	**7 932**	**9 385**	**4 587**	**8 343**	**5 221**	**4 497**	-	-	**2 145**	**3 385**	**5 137**	**8 186**
In households	7 932	9 385	4 511	8 343	5 221	4 497	-	-	1 116	3 384	5 129	8 163
Householder	2 671	3 358	1 397	2 544	1 527	1 421	-	-	741	1 265	1 788	2 111
Family householder	2 150	2 526	1 274	2 321	1 408	1 190	-	-	154	798	1 184	1 773
Nonfamily householder	521	832	123	223	119	231	-	-	587	467	604	338
Living alone	423	714	104	191	94	173	-	-	541	420	553	261
Spouse	1 872	2 139	1 159	2 069	1 304	982	-	-	114	320	509	1 387
Other relatives	3 186	3 627	1 881	3 632	2 305	1 956	-	-	185	1 662	2 677	4 335
Nonrelatives	203	261	74	98	85	138	-	-	76	137	155	330
Inmate of institution	-	-	76	-	-	-	-	-	456	-	-	-
Other, in group quarters	-	-	-	-	-	-	-	-	573	1	8	23
Persons per household	2.97	2.79	3.23	3.28	3.42	3.16	-	-	1.51	2.68	2.87	3.87
Persons per family	3.35	3.28	3.39	3.46	3.56	3.47	-	-	2.94	3.48	3.69	4.23
Persons 65 years and over	**143**	**469**	**203**	**186**	**72**	**105**	-	-	**212**	**503**	**637**	**518**
In households	143	469	129	186	72	105	-	-	170	502	636	518
Householder	78	305	65	110	31	54	-	-	141	380	467	327
Nonfamily householder	31	142	25	43	5	13	-	-	123	203	233	116
Living alone	31	140	25	42	5	13	-	-	117	194	220	108
Spouse	26	97	30	38	14	29	-	-	16	55	104	109
Other relatives	39	65	29	35	26	22	-	-	4	46	49	77
Nonrelatives	-	2	5	3	1	-	-	-	9	21	16	5
Inmate of institution	-	-	74	-	-	-	-	-	14	-	-	-
Other, in group quarters	-	-	-	-	-	-	-	-	28	1	1	-
FAMILY TYPE BY PRESENCE OF OWN CHILDREN												
Families	**2 150**	**2 526**	**1 274**	**2 321**	**1 408**	**1 190**	-	-	**154**	**798**	**1 184**	**1 773**
With own children under 18 years	1 372	1 379	848	1 534	1 005	774	-	-	52	388	628	1 113
Number of own children under 18 years	2 452	2 653	1 543	2 862	1 875	1 493	-	-	123	818	1 500	2 756
Married-couple families	**1 872**	**2 139**	**1 159**	**2 069**	**1 304**	**982**	-	-	**114**	**320**	**509**	**1 387**
With own children under 18 years	1 182	1 133	770	1 347	929	617	-	-	34	130	197	896
Number of own children under 18 years	2 147	2 222	1 416	2 559	1 754	1 215	-	-	78	261	454	2 298
Female householder, no husband present	**194**	**288**	**74**	**184**	**70**	**161**	-	-	**23**	**415**	**594**	**285**
With own children under 18 years	152	201	56	144	57	128	-	-	13	238	404	189
Number of own children under 18 years	239	353	91	241	89	235	-	-	40	528	989	403
MARITAL STATUS												
Male, 15 years and over	**2 845**	**3 563**	**1 597**	**2 925**	**1 786**	**1 610**	-	-	**1 501**	**1 072**	**1 568**	**2 952**
Single	707	917	300	676	363	424	-	-	630	443	638	974
Now married, except separated	1 930	2 220	1 186	2 102	1 327	1 010	-	-	289	376	570	1 713
Separated	42	60	19	15	11	27	-	-	114	86	118	83
Widowed	20	85	17	17	9	10	-	-	97	76	107	62
Divorced	146	281	75	115	76	139	-	-	371	91	135	120
Female, 15 years and over	**2 961**	**3 387**	**1 619**	**3 019**	**1 741**	**1 568**	-	-	**481**	**1 450**	**2 024**	**2 627**
Single	590	472	205	543	256	278	-	-	106	459	619	588
Now married, except separated	1 922	2 226	1 179	2 111	1 338	1 018	-	-	177	353	554	1 527
Separated	42	85	31	47	22	44	-	-	51	143	223	104
Widowed	135	283	127	132	47	63	-	-	77	321	365	254
Divorced	272	321	77	186	78	165	-	-	70	174	263	154

Table P-1. **General Characteristics of Persons: 1980**—Con.

For meaning of symbols, see introduction. For definitions of terms, see appendixes A and B)

Census Tracts	Houston city (pt.), Harris County—Con.												
	Tract 0202.99	Tract 0203.01	Tract 0203.02	Tract 0203.03	Tract 0204	Tract 0205.01	Tract 0205.02	Tract 0205.03	Tract 0206.01	Tract 0206.02	Tract 0207.01	Tract 0207.02	Tract 0207.03
AGE													
Total persons	42	3 779	5 853	2 463	3 111	4 020	5 757	2 431	3 512	3 524	2 689	2 753	2 622
Under 5 years	-	404	515	281	231	402	532	211	283	317	241	261	207
5 to 9 years	-	379	685	268	259	336	514	187	291	316	263	318	200
10 to 14 years	-	358	683	235	249	337	509	158	325	353	286	331	258
15 to 19 years	12	375	686	285	274	393	553	254	396	385	344	361	290
20 to 24 years	22	322	573	223	236	347	533	220	328	345	271	233	226
25 to 34 years	4	581	970	406	420	584	849	282	497	442	321	368	360
35 to 44 years	2	347	514	219	291	332	534	214	320	314	255	244	211
45 to 54 years	-	341	538	192	364	388	587	268	335	328	348	261	320
55 to 64 years	2	332	384	163	301	403	578	271	384	302	205	201	274
65 to 74 years	-	222	200	115	297	335	377	205	203	272	106	129	163
75 years and over	-	118	105	76	189	163	191	161	150	150	49	46	113
3 and 4 years	-	147	263	103	95	138	229	83	104	123	96	106	90
16 years and over	42	2 567	3 753	1 612	2 310	2 861	4 092	1 820	2 537	2 462	1 838	1 762	1 892
18 years and over	38	2 416	3 479	1 492	2 199	2 699	3 865	1 720	2 381	2 309	1 699	1 615	1 773
21 years and over	25	2 184	3 044	1 341	2 058	2 458	3 532	1 583	2 140	2 078	1 492	1 429	1 611
60 years and over	2	476	466	259	621	674	843	483	520	553	239	258	404
62 years and over	2	404	389	223	573	593	719	425	445	504	200	213	340
Median	21.6	25.7	22.1	23.3	32.0	27.6	27.3	29.9	27.3	25.8	23.6	22.1	28.0
Female	21	1 908	2 857	1 229	1 685	2 061	3 131	1 308	1 895	1 781	1 386	1 543	1 371
Under 5 years	-	197	308	138	110	195	264	107	147	137	124	128	101
5 to 9 years	-	189	327	118	131	155	287	94	147	169	145	143	86
10 to 14 years	-	184	338	125	122	184	276	82	163	172	148	160	132
15 to 19 years	6	170	327	134	151	187	311	138	196	194	166	208	140
20 to 24 years	9	155	255	111	135	176	288	109	187	160	123	137	103
25 to 34 years	2	296	415	187	218	292	449	146	260	230	164	239	203
35 to 44 years	2	152	239	106	151	164	286	102	176	170	142	150	120
45 to 54 years	-	173	275	105	187	214	328	143	191	176	195	158	173
55 to 64 years	2	184	187	88	158	217	333	162	211	164	99	110	162
65 to 74 years	-	130	114	69	198	186	203	122	129	143	48	82	83
75 years and over	-	78	72	48	124	91	106	103	88	66	32	28	68
3 and 4 years	-	71	126	47	50	66	113	47	56	47	48	51	43
16 years and over	21	1 298	1 838	817	1 285	1 480	2 245	1 001	1 400	1 273	939	1 069	1 021
18 years and over	19	1 232	1 697	761	1 229	1 399	2 118	942	1 321	1 188	869	977	971
21 years and over	13	1 131	1 494	694	1 146	1 298	1 927	875	1 186	1 078	772	870	890
60 years and over	2	281	261	156	403	376	475	293	307	289	117	159	217
62 years and over	2	246	223	137	374	332	399	259	271	258	97	134	181
Median	21.8	26.8	22.6	24.5	33.6	28.6	27.5	33.0	28.4	27.8	24.3	24.9	30.7
HOUSEHOLD TYPE AND RELATIONSHIP													
Total persons	42	3 779	5 853	2 463	3 111	4 020	5 757	2 431	3 512	3 524	2 689	2 753	2 622
In households	-	3 770	5 852	2 463	3 105	4 013	5 757	2 429	3 410	3 524	2 689	2 753	2 542
Householder	-	1 147	1 466	690	1 226	1 440	2 081	939	1 201	1 093	783	790	785
Family householder	-	863	1 260	536	723	903	1 359	585	836	835	623	644	610
Nonfamily householder	-	284	206	154	503	537	722	354	365	258	160	146	175
Living alone	-	233	169	135	449	468	647	304	329	216	139	126	163
Spouse	-	620	1 043	441	343	471	723	268	436	469	403	310	391
Other relatives	-	1 866	3 226	1 278	1 400	1 915	2 740	1 123	1 659	1 821	1 445	1 596	1 325
Nonrelatives	-	137	117	54	136	187	213	99	114	141	58	57	41
Inmate of institution	-	-	-	-	-	-	-	2	40	-	-	-	80
Other, in group quarters	42	9	1	-	6	7	-	-	62	-	-	-	-
Persons per household	-	3.29	3.99	3.57	2.53	2.79	2.77	2.59	2.84	3.22	3.43	3.48	3.24
Persons per family	-	3.88	4.39	4.21	3.41	3.64	3.55	3.38	3.51	3.74	3.97	3.96	3.81
Persons 65 years and over	-	340	305	191	486	498	568	366	353	422	155	175	276
In households	-	340	305	191	486	497	568	365	317	422	155	175	208
Householder	-	233	206	131	359	349	402	295	230	288	111	114	152
Nonfamily householder	-	107	85	67	161	181	177	163	101	94	48	39	63
Living alone	-	101	80	64	151	164	165	148	92	90	46	33	62
Spouse	-	57	53	33	83	63	98	40	43	87	24	31	33
Other relatives	-	44	42	23	38	57	56	17	36	40	19	27	23
Nonrelatives	-	6	4	4	6	28	12	13	8	7	1	3	-
Inmate of institution	-	-	-	-	-	-	-	1	31	-	-	-	68
Other, in group quarters	-	-	-	-	-	1	-	-	5	-	-	-	-
FAMILY TYPE BY PRESENCE OF OWN CHILDREN													
Families	-	863	1 260	536	723	903	1 359	585	836	835	623	644	610
With own children under 18 years	-	473	827	342	318	469	706	243	439	416	375	406	329
Number of own children under 18 years	-	1 183	2 109	846	689	1 026	1 509	501	932	958	838	957	669
Married-couple families	-	620	1 043	441	343	471	723	268	436	469	403	310	391
With own children under 18 years	-	355	721	298	138	223	335	95	204	219	233	176	201
Number of own children under 18 years	-	879	1 857	742	308	493	672	193	422	497	538	406	425
Female householder, no husband present	-	193	152	66	330	352	552	264	341	290	178	306	188
With own children under 18 years	-	110	83	35	166	220	336	130	211	173	125	223	119
Number of own children under 18 years	-	285	195	76	355	486	781	273	471	416	270	538	230
MARITAL STATUS													
Male, 15 years and over	21	1 300	1 986	831	1 050	1 418	1 898	850	1 175	1 235	930	731	905
Single	21	406	651	269	379	528	691	317	451	443	356	291	328
Now married, except separated	-	740	1 182	484	397	546	783	295	486	537	429	339	440
Separated	-	52	49	23	100	111	149	91	81	95	51	32	37
Widowed	-	29	36	20	54	106	126	74	65	70	34	21	38
Divorced	-	73	68	35	120	127	149	73	92	90	60	48	62
Female, 15 years and over	21	1 338	1 884	848	1 322	1 527	2 304	1 025	1 438	1 303	969	1 112	1 052
Single	21	277	398	186	372	451	667	280	413	363	286	384	285
Now married, except separated	-	681	1 143	472	379	512	772	285	486	510	425	337	428
Separated	-	84	67	29	119	137	260	134	124	100	85	106	70
Widowed	-	184	175	103	313	270	346	232	252	213	88	130	155
Divorced	-	112	101	58	139	157	259	94	163	117	85	155	114

Table P-1. **General Characteristics of Persons: 1980**—Con.

For meaning of symbols, see introduction. For definitions of terms, see appendixes A and B1

Census Tracts	Houston city (pt.), Harris County—Con.												
	Tract 0207.04	Tract 0208.01	Tract 0208.02	Tract 0208.03	Tract 0209	Tract 0210.01	Tract 0210.02	Tract 0211*	Tract 0212*	Tract 0213.01	Tract 0213.02	Tract 0214.01	Tract 0214.02
AGE													
Total persons	**988**	**1 880**	**4 822**	**5 719**	**751**	**5 473**	**3 222**	-	-	**2 951**	**9 136**	**374**	**2 849**
Under 5 years	80	177	349	366	77	336	238	-	-	234	1 027	49	193
5 to 9 years	94	170	467	556	68	383	269	-	-	228	803	38	225
10 to 14 years	76	153	433	459	53	390	309	-	-	266	465	40	239
15 to 19 years	107	240	482	632	74	571	318	-	-	299	583	41	321
20 to 24 years	78	224	531	632	90	593	290	-	-	212	1 480	24	248
25 to 34 years	149	301	751	801	123	569	382	-	-	443	2 519	47	407
35 to 44 years	98	181	475	471	74	436	260	-	-	400	815	11	321
45 to 54 years	121	173	458	651	67	929	288	-	-	385	593	38	289
55 to 64 years	85	149	393	518	59	729	402	-	-	310	421	46	313
65 to 74 years	60	78	238	303	34	383	313	-	-	127	240	38	193
75 years and over	20	34	145	130	12	154	153	-	-	47	190	32	100
3 and 4 years	28	76	161	243	30	123	94	-	-	113	398	6	75
16 years and over	711	1 339	3 373	4 012	522	4 271	2 341	-	-	2 158	6 752	271	2 135
18 years and over	669	1 247	3 178	3 757	491	4 013	2 206	-	-	2 034	6 581	257	2 006
21 years and over	609	1 096	2 879	3 372	440	3 655	2 033	-	-	1 878	6 027	233	1 813
60 years and over	126	174	573	654	62	822	675	-	-	284	598	94	429
62 years and over	105	139	500	550	56	704	585	-	-	228	517	82	360
Median	27.1	24.4	25.4	25.1	24.4	32.5	28.9	-	-	30.3	25.7	29.4	29.9
Female	**489**	**1 006**	**2 545**	**2 998**	**381**	**2 824**	**1 751**	-	-	**1 489**	**4 600**	**206**	**1 440**
Under 5 years	44	88	226	277	47	161	127	-	-	105	504	12	100
5 to 9 years	45	88	227	282	32	179	138	-	-	116	411	18	118
10 to 14 years	39	77	213	246	30	198	146	-	-	123	232	19	132
15 to 19 years	50	112	231	290	31	253	161	-	-	139	322	25	156
20 to 24 years	47	120	234	321	54	296	144	-	-	116	787	11	128
25 to 34 years	74	167	401	436	61	292	219	-	-	226	1 186	29	194
35 to 44 years	46	104	252	287	37	250	155	-	-	205	346	5	157
45 to 54 years	61	104	269	367	42	509	171	-	-	198	315	27	150
55 to 64 years	45	81	207	277	23	360	238	-	-	155	209	29	153
65 to 74 years	27	44	143	154	19	217	169	-	-	74	145	17	103
75 years and over	11	21	92	61	5	109	83	-	-	32	143	14	49
3 and 4 years	15	34	87	118	17	63	48	-	-	56	198	4	39
16 years and over	348	730	1 833	2 132	265	2 252	1 304	-	-	1 118	3 410	154	1 057
18 years and over	331	685	1 739	2 022	257	2 150	1 237	-	-	1 060	3 323	143	993
21 years and over	297	611	1 582	1 846	232	1 965	1 151	-	-	980	3 004	129	899
60 years and over	57	100	330	339	29	470	382	-	-	158	370	47	218
62 years and over	48	83	290	282	28	408	328	-	-	134	330	41	193
Median	26.2	26.1	26.7	26.6	24.4	36.6	31.2	-	-	31.3	25.3	31.0	29.6
HOUSEHOLD TYPE AND RELATIONSHIP													
Total persons	**988**	**1 880**	**4 822**	**5 719**	**751**	**5 473**	**3 222**	-	-	**2 951**	**9 136**	**374**	**2 849**
In households	976	1 880	4 813	5 705	751	5 473	3 222	-	-	2 951	8 994	374	2 756
Householder	320	604	1 610	1 772	220	1 761	1 072	-	-	951	3 629	129	926
Family householder	225	464	1 201	1 428	189	1 373	803	-	-	805	2 404	87	662
Nonfamily householder	95	140	409	344	31	388	269	-	-	146	1 225	42	264
Living alone	83	114	365	306	28	366	247	-	-	138	1 042	39	242
Spouse	148	239	665	918	171	1 057	472	-	-	729	1 943	50	565
Other relatives	476	955	2 420	2 883	343	2 549	1 611	-	-	1 238	3 126	186	1 177
Nonrelatives	32	82	118	132	17	106	67	-	-	33	296	9	88
Inmate of institution	-	-	-	-	-	-	-	-	-	-	142	-	-
Other, in group quarters	12	-	9	14	-	-	-	-	-	-	-	-	93
Persons per household	3.05	3.11	2.99	3.22	3.41	3.11	3.01	-	-	3.10	2.48	2.90	2.98
Persons per family	3.77	3.57	3.57	3.66	3.72	3.63	3.59	-	-	3.44	3.11	3.71	3.63
Persons 65 years and over	**80**	**112**	**383**	**432**	**46**	**537**	**466**	-	-	**174**	**430**	**70**	**293**
In households	79	112	383	433	46	537	466	-	-	174	313	70	293
Householder	54	71	269	286	28	381	333	-	-	104	220	55	200
Nonfamily householder	21	23	100	88	9	180	113	-	-	40	126	23	90
Living alone	19	20	93	84	9	176	108	-	-	39	125	21	86
Spouse	14	22	74	81	11	93	85	-	-	39	49	7	51
Other relatives	9	16	36	55	7	59	39	-	-	30	40	8	34
Nonrelatives	2	3	4	11	-	4	9	-	-	1	4	-	8
Inmate of institution	-	-	-	-	-	-	-	-	-	-	117	-	-
Other, in group quarters	1	-	-	-	-	-	-	-	-	-	-	-	-
FAMILY TYPE BY PRESENCE OF OWN CHILDREN													
Families	**225**	**464**	**1 201**	**1 428**	**189**	**1 373**	**803**	-	-	**805**	**2 404**	**87**	**662**
With own children under 18 years	127	274	656	784	112	576	344	-	-	430	1 402	39	343
Number of own children under 18 years	255	530	1 334	1 592	235	1 101	747	-	-	838	2 393	90	744
Married-couple families	**148**	**239**	**665**	**918**	**171**	**1 057**	**472**	-	-	**729**	**1 943**	**50**	**565**
With own children under 18 years	76	127	332	476	105	447	183	-	-	390	1 098	19	308
Number of own children under 18 years	161	232	682	960	218	879	394	-	-	772	1 922	41	675
Female householder, no husband present	**62**	**194**	**443**	**427**	**13**	**247**	**277**	-	-	**54**	**345**	**31**	**56**
With own children under 18 years	45	134	289	280	7	108	147	-	-	30	258	16	25
Number of own children under 18 years	82	275	588	573	17	185	335	-	-	49	401	39	52
MARITAL STATUS													
Male, 15 years and over	**377**	**627**	**1 594**	**1 945**	**261**	**2 078**	**1 066**	-	-	**1 078**	**3 388**	**120**	**1 102**
Single	142	272	605	695	66	698	377	-	-	257	876	39	318
Now married, except separated	166	258	729	990	178	1 160	504	-	-	758	2 033	56	633
Separated	22	37	69	92	2	71	62	-	-	9	103	3	25
Widowed	8	16	52	71	6	51	57	-	-	17	61	10	63
Divorced	39	44	139	97	9	98	66	-	-	37	315	12	63
Female, 15 years and over	**361**	**753**	**1 879**	**2 193**	**272**	**2 286**	**1 340**	-	-	**1 145**	**3 453**	**157**	**1 090**
Single	108	256	528	604	56	561	347	-	-	188	627	42	272
Now married, except separated	158	255	723	961	176	1 117	500	-	-	755	2 026	52	600
Separated	26	83	167	162	8	89	90	-	-	20	145	12	27
Widowed	31	74	243	253	17	327	246	-	-	96	307	30	119
Divorced	38	85	218	213	15	192	157	-	-	86	348	21	72

ple P-1. General Characteristics of Persons: 1980—Con.

[For meaning of symbols, see introduction. For definitions of terms, see appendixes A and B]

Census Tracts	Houston city (pt.), Harris County—Con.												
	Tract 0215.01	Tract 0215.02	Tract 0215.03	Tract 0216.01	Tract 0216.02	Tract 0217.01	Tract 0217.02	Tract 0218.01	Tract 0218.02	Tract 0218.03	Tract 0218.04	Tract 0219	Tract 0220.01
Total persons	4 411	5 946	6 519	3 808	2 115	6 840	3 504	2 380	2 579	2 074	5 481	6 212	2 844
Under 5 years	380	563	512	286	153	754	341	238	242	223	575	708	313
5 to 9 years	403	675	587	346	171	685	310	236	269	170	663	606	245
10 to 14 years	528	756	603	364	243	653	335	186	245	180	683	549	221
15 to 19 years	636	733	798	487	343	744	387	227	298	221	645	614	224
20 to 24 years	402	472	568	363	156	709	372	291	227	282	565	690	267
25 to 34 years	551	879	752	427	230	1 021	392	473	366	309	861	972	471
35 to 44 years	620	782	530	399	347	638	338	264	285	234	503	517	271
45 to 54 years	463	561	714	435	209	555	365	189	249	221	465	579	247
55 to 64 years	260	307	727	314	146	497	280	130	200	144	273	464	279
65 to 74 years	118	158	490	239	83	381	245	110	143	70	179	330	197
75 years and over	50	60	238	148	34	203	139	36	55	20	69	183	109
5 and 4 years	150	255	196	112	63	322	133	101	94	98	235	273	129
16 years and over	2 972	3 780	4 678	2 728	1 470	4 591	2 449	1 680	1 760	1 469	3 428	4 252	2 023
18 years and over	2 691	3 488	4 328	2 532	1 320	4 271	2 264	1 600	1 628	1 379	3 176	3 989	1 941
21 years and over	2 365	3 103	3 884	2 232	1 155	3 864	2 035	1 421	1 472	1 240	2 786	3 603	1 801
62 years and over	273	336	1 060	527	169	814	527	220	271	157	350	731	449
65 years and over	230	274	928	466	155	716	466	186	244	124	300	662	393
Median	22.9	22.5	27.0	26.3	24.6	24.1	25.1	25.2	25.2	24.3	21.4	24.5	27.5
Female	2 288	3 038	3 499	2 016	1 118	3 620	1 832	1 029	1 308	1 016	2 933	3 089	1 424
Under 5 years	173	287	275	144	83	370	163	107	141	106	286	359	135
5 to 9 years	194	329	271	165	92	350	173	120	126	89	349	277	121
10 to 14 years	273	357	286	191	120	319	162	82	120	83	345	263	111
15 to 19 years	353	366	422	233	178	394	185	102	153	108	341	283	99
20 to 24 years	190	251	278	184	83	385	185	128	106	134	287	329	137
25 to 34 years	312	466	425	240	133	547	212	156	179	144	501	488	224
35 to 44 years	339	436	308	224	197	351	187	120	154	115	267	248	135
45 to 54 years	255	286	416	250	105	310	207	68	119	110	270	306	130
55 to 64 years	115	137	418	160	66	271	154	71	111	71	142	244	167
65 to 74 years	57	83	274	143	45	208	133	58	67	41	100	181	103
75 years and over	27	40	126	82	16	115	71	17	32	15	45	111	62
5 and 4 years	72	124	103	56	34	146	63	45	49	51	116	137	53
16 years and over	1 578	1 982	2 590	1 468	790	2 507	1 292	700	890	726	1 876	2 148	1 039
18 years and over	1 424	1 830	2 401	1 377	714	2 333	1 209	667	819	681	1 738	2 021	1 002
21 years and over	1 251	1 652	2 186	1 233	615	2 108	1 102	591	747	611	1 540	1 846	933
60 years and over	125	175	593	300	84	449	286	112	136	91	189	406	252
62 years and over	107	147	511	269	76	394	248	93	125	75	164	374	217
Median	23.7	23.8	29.8	28.8	25.1	24.9	26.6	24.2	25.4	24.6	22.5	25.4	28.8
HOUSEHOLD TYPE AND RELATIONSHIP													
Total persons	4 411	5 946	6 519	3 808	2 115	6 840	3 504	2 380	2 579	2 074	5 481	6 212	2 844
In households	4 411	5 946	6 519	3 805	2 115	6 765	3 410	2 380	2 579	2 074	5 481	6 132	2 844
Householder	1 149	1 594	2 094	1 143	583	2 057	1 063	758	720	670	1 685	1 843	931
Family householder	1 018	1 380	1 609	908	518	1 641	814	540	604	491	1 308	1 442	743
Nonfamily householder	131	214	485	235	65	416	249	218	116	179	377	401	188
Living alone	118	174	452	219	57	362	227	161	100	147	320	329	169
Spouse	721	1 035	950	595	376	940	479	436	489	361	704	1 097	619
Other relatives	2 476	3 223	3 346	2 002	1 121	3 598	1 788	995	1 313	965	2 901	2 902	1 234
Nonrelatives	65	94	129	65	35	170	80	191	57	78	191	290	60
Inmate of institution	-	-	-	-	-	75	94	-	-	-	-	-	-
Other, in group quarters	-	-	-	3	-	-	-	-	-	-	-	80	-
Persons per household	3.84	3.73	3.11	3.33	3.63	3.29	3.21	3.14	3.58	3.10	3.25	3.33	3.05
Persons per family	4.14	4.09	3.67	3.86	3.89	3.77	3.79	3.65	3.98	3.70	3.76	3.77	3.49
Persons 65 years and over	168	218	728	387	117	584	384	146	198	90	248	513	306
In households	168	218	728	387	117	526	326	146	198	90	248	461	306
Householder	101	117	530	267	68	370	236	105	141	64	178	311	211
Nonfamily householder	38	36	221	110	22	122	104	40	53	30	78	121	84
Living alone	35	33	212	104	20	110	96	39	50	29	76	120	79
Spouse	30	52	115	69	29	96	60	33	42	16	38	103	57
Other relatives	31	40	74	48	17	48	23	8	15	10	28	43	31
Nonrelatives	6	9	9	3	3	12	7	-	-	-	4	4	7
Inmate of institution	-	-	-	-	-	58	58	-	-	-	-	-	-
Other, in group quarters	-	-	-	-	-	-	-	-	-	-	-	52	-
FAMILY TYPE BY PRESENCE OF OWN CHILDREN													
Families	1 018	1 380	1 609	908	518	1 641	814	540	604	491	1 308	1 442	743
With own children under 18 years	663	901	786	486	310	990	448	315	352	274	886	848	391
Number of own children under 18 years	1 448	2 145	1 675	1 029	667	2 117	969	690	815	575	1 968	1 871	795
Married-couple families	721	1 035	950	595	376	940	479	436	489	361	704	1 097	619
With own children under 18 years	469	678	408	318	220	537	243	263	297	193	429	640	338
Number of own children under 18 years	1 063	1 660	877	686	474	1 098	516	590	696	398	909	1 435	713
Female householder, no husband present	245	288	563	260	110	578	275	57	88	97	509	269	83
With own children under 18 years	172	200	338	147	77	410	182	36	46	66	404	176	38
Number of own children under 18 years	344	436	733	311	173	947	407	73	104	154	951	366	58
MARITAL STATUS													
Male, 15 years and over	1 452	1 887	2 150	1 296	725	2 167	1 184	1 000	902	763	1 607	2 159	1 008
Single	530	607	759	475	246	754	462	349	271	257	608	724	218
Now married, except separated	766	1 098	1 014	645	394	1 036	506	527	534	397	770	1 211	666
Separated	57	74	120	55	28	138	60	36	21	32	104	45	20
Widowed	34	22	116	50	24	84	82	25	28	20	33	61	24
Divorced	65	86	141	71	33	155	74	63	48	57	92	118	80
Female, 15 years and over	1 648	2 065	2 667	1 516	823	2 581	1 334	720	921	738	1 953	2 190	1 057
Single	525	545	741	410	253	746	361	125	206	180	653	478	134
Now married, except separated	769	1 083	1 006	647	400	1 001	503	472	529	391	745	1 150	665
Separated	107	108	208	115	48	228	112	23	36	55	174	107	24
Widowed	116	163	427	213	56	312	225	49	85	61	178	278	147
Divorced	131	166	285	131	66	294	133	51	65	51	203	177	87

Table P-1. **General Characteristics of Persons: 1980**—Con.

[For meaning of symbols, see introduction. For definitions of terms, see appendixes A and B]

Census Tracts	Houston city (pt.), Harris County—Con.												
	Tract 0249.03P	Tract 0250P	Tract 0251P	Tract 0253P	Tract 0254P	Tract 0263P	Tract 0264P	Tract 0273.99	Tract 0300.22	Tract 0300.23	Tract 0300.24	Tract 0301.01	Tract 0301.02
AGE													
Total persons	**358**	**226**	**2 565**	**182**	-	-	-	**80**	**3 962**	**1 472**	**3 242**	**4 972**	**6 154**
Under 5 years	23	15	209	12	-	-	-	3	446	135	258	544	674
5 to 9 years	20	11	237	14	-	-	-	1	503	138	269	516	690
10 to 14 years	22	20	298	22	-	-	-	-	480	128	222	463	624
15 to 19 years	35	18	239	14	-	-	-	10	491	145	293	483	659
20 to 24 years	31	13	156	20	-	-	-	25	373	110	323	587	618
25 to 34 years	61	30	454	29	-	-	-	19	519	211	591	815	1 010
35 to 44 years	57	22	406	14	-	-	-	9	362	135	340	471	610
45 to 54 years	41	34	271	21	-	-	-	5	312	132	357	422	516
55 to 64 years	42	28	158	25	-	-	-	7	228	103	282	307	390
65 to 74 years	22	25	97	9	-	-	-	1	146	116	201	223	245
75 years and over	4	10	40	2	-	-	-	-	102	119	106	141	118
3 and 4 years	6	7	91	5	-	-	-	1	170	55	104	196	279
16 years and over	286	173	1 764	130	-	-	-	76	2 441	1 048	2 440	3 362	4 044
18 years and over	272	167	1 658	121	-	-	-	74	2 216	987	2 328	3 167	3 776
21 years and over	253	162	1 563	117	-	-	-	60	1 948	909	2 130	2 847	3 357
60 years and over	39	45	200	23	-	-	-	6	342	280	434	495	501
62 years and over	33	41	178	16	-	-	-	2	310	262	376	428	438
Median	32.3	38.7	28.9	28.4	-	-	-	25.5	20.6	28.3	28.7	23.9	23.5
Female	**163**	**107**	**1 281**	**86**	-	-	-	**22**	**1 980**	**730**	**1 586**	**2 379**	**2 878**
Under 5 years	8	7	102	6	-	-	-	1	209	68	138	277	299
5 to 9 years	14	4	126	3	-	-	-	-	256	63	156	247	336
10 to 14 years	8	10	143	10	-	-	-	-	228	68	122	217	305
15 to 19 years	12	6	109	5	-	-	-	5	247	80	140	223	291
20 to 24 years	19	9	75	11	-	-	-	7	168	35	145	249	258
25 to 34 years	24	12	240	14	-	-	-	3	252	99	257	357	451
35 to 44 years	26	13	210	10	-	-	-	3	195	63	151	227	286
45 to 54 years	19	17	121	8	-	-	-	1	179	59	162	199	254
55 to 64 years	20	14	72	14	-	-	-	2	121	47	138	166	184
65 to 74 years	12	11	58	5	-	-	-	-	74	65	112	121	139
75 years and over	1	4	25	-	-	-	-	-	51	83	65	96	75
3 and 4 years	1	3	48	3	-	-	-	1	80	24	46	100	113
16 years and over	131	83	892	67	-	-	-	21	1 239	517	1 141	1 584	1 883
18 years and over	125	82	836	63	-	-	-	20	1 128	481	1 097	1 491	1 767
21 years and over	117	80	791	61	-	-	-	14	997	444	1 000	1 367	1 580
60 years and over	19	21	111	12	-	-	-	1	174	167	231	296	282
62 years and over	16	19	97	9	-	-	-	1	159	160	207	256	251
Median	33.4	38.8	29.5	30.0	-	-	-	22.5	21.2	29.5	28.1	24.4	24.0
HOUSEHOLD TYPE AND RELATIONSHIP													
Total persons	**358**	**226**	**2 565**	**182**	-	-	-	**80**	**3 962**	**1 472**	**3 242**	**4 972**	**6 154**
In households	358	226	2 565	182	-	-	-	21	3 948	1 358	3 145	4 959	6 127
Householder	149	86	797	59	-	-	-	3	996	403	1 245	1 430	1 679
Family householder	106	74	712	54	-	-	-	3	808	296	693	1 085	1 302
Nonfamily householder	43	12	85	5	-	-	-	-	188	107	552	345	377
Living alone	36	12	79	5	-	-	-	-	145	79	447	260	300
Spouse	91	64	643	48	-	-	-	1	467	207	390	856	1 003
Other relatives	103	76	1 108	73	-	-	-	8	2 320	674	1 265	2 403	3 171
Nonrelatives	15	-	17	2	-	-	-	9	165	74	245	270	274
Inmate of institution	-	-	-	-	-	-	-	-	-	103	49	-	-
Other, in group quarters	-	-	-	-	-	-	-	59	14	11	48	13	27
Persons per household	2.40	2.63	3.22	3.08	-	-	-	7.00	3.96	3.37	2.53	3.47	3.65
Persons per family	2.83	2.89	3.46	3.24	-	-	-	4.00	4.45	3.98	3.39	4.00	4.21
Persons 65 years and over	**26**	**35**	**137**	**11**	-	-	-	**1**	**248**	**235**	**307**	**366**	**363**
In households	26	35	137	11	-	-	-	1	248	136	305	363	360
Householder	16	23	71	6	-	-	-	-	162	89	212	241	244
Nonfamily householder	5	7	24	-	-	-	-	-	61	26	124	113	115
Living alone	5	7	23	-	-	-	-	-	56	20	102	104	108
Spouse	9	10	40	4	-	-	-	-	49	24	46	67	70
Other relatives	1	2	24	1	-	-	-	1	22	19	26	43	41
Nonrelatives	-	-	2	-	-	-	-	-	15	4	21	12	5
Inmate of institution	-	-	-	-	-	-	-	-	-	98	-	-	-
Other, in group quarters	-	-	-	-	-	-	-	-	-	1	2	1	3
FAMILY TYPE BY PRESENCE OF OWN CHILDREN													
Families	**106**	**74**	**712**	**54**	-	-	-	...	**808**	**296**	**693**	**1 085**	**1 302**
With own children under 18 years	45	28	450	30	-	-	-	...	541	176	344	679	811
Number of own children under 18 years	71	46	853	56	-	-	-	4	1 504	411	713	1 595	2 113
Married-couple families	**91**	**64**	**643**	**48**	-	-	-	...	**467**	**207**	**390**	**856**	**1 003**
With own children under 18 years	37	25	405	26	-	-	-	...	310	135	174	571	663
Number of own children under 18 years	59	43	785	50	-	-	-	4	874	326	361	1 362	1 750
Female householder, no husband present	**12**	**6**	**53**	**5**	-	-	-	...	**285**	**59**	**239**	**150**	**198**
With own children under 18 years	6	2	36	4	-	-	-	...	213	29	146	80	121
Number of own children under 18 years	8	2	56	6	-	-	-	-	588	61	305	166	305
MARITAL STATUS													
Male, 15 years and over	**160**	**94**	**911**	**67**	-	-	-	**55**	**1 246**	**540**	**1 322**	**1 811**	**2 228**
Single	39	14	195	13	-	-	-	16	532	183	535	592	777
Now married, except separated	92	69	665	49	-	-	-	31	548	251	443	1 043	1 225
Separated	4	1	11	1	-	-	-	1	67	22	122	68	65
Widowed	2	2	9	-	-	-	-	-	45	34	70	37	56
Divorced	23	8	31	4	-	-	-	7	54	50	153	71	105
Female, 15 years and over	**133**	**86**	**910**	**67**	-	-	-	**21**	**1 287**	**531**	**1 170**	**1 638**	**1 938**
Single	10	7	133	8	-	-	-	16	413	117	318	359	441
Now married, except separated	92	67	656	48	-	-	-	1	528	236	422	935	1 101
Separated	4	1	14	3	-	-	-	-	119	19	110	63	87
Widowed	8	9	58	6	-	-	-	-	128	117	194	186	183
Divorced	19	2	49	2	-	-	-	4	99	42	126	95	126

Table P-1. **General Characteristics of Persons: 1980**—Con.

[For meaning of symbols, see introduction. For definitions of terms, see appendixes A and B]

Census Tracts	Houston city (pt.), Harris County—Con.												
	Tract 0302	Tract 0303	Tract 0304.01	Tract 0304.02	Tract 0305.01	Tract 0305.02	Tract 0306	Tract 0307.01	Tract 0307.02	Tract 0308	Tract 0309.01	Tract 0309.02	Tract 0309.03
AGE													
Total persons	**6 654**	**2 127**	**4 642**	**5 206**	**4 250**	**4 251**	**5 119**	**5 780**	**4 900**	**7 431**	**6 049**	**3 086**	**3 110**
Under 5 years	592	197	337	507	364	323	333	379	351	406	555	286	301
5 to 9 years	506	184	419	464	361	356	356	523	358	376	524	166	220
10 to 14 years	489	184	415	486	364	372	390	469	321	294	436	127	153
15 to 19 years	571	227	438	495	314	788	429	478	352	916	505	262	189
20 to 24 years	814	195	391	417	363	761	504	539	577	2 002	549	611	307
25 to 34 years	1 351	264	612	754	667	490	880	1 129	927	1 372	1 123	773	533
35 to 44 years	543	199	405	483	378	305	543	606	422	536	544	265	270
45 to 54 years	488	216	472	456	437	253	545	486	478	506	449	164	233
55 to 64 years	431	193	434	499	400	298	491	397	487	389	475	175	330
65 to 74 years	285	176	426	384	356	178	440	322	360	397	407	164	351
75 years and over	284	92	293	261	246	127	208	152	267	237	282	93	223
3 and 4 years	261	74	144	193	139	119	140	228	139	149	244	84	116
16 years and over	4 760	1 510	3 385	3 639	3 098	3 122	3 947	4 096	3 808	6 299	4 343	2 486	2 399
18 years and over	4 537	1 427	3 199	3 451	2 973	2 963	3 776	3 922	3 662	6 162	4 159	2 397	2 334
21 years and over	4 139	1 293	2 938	3 182	2 779	2 134	3 541	3 633	3 424	4 980	3 800	2 144	2 197
60 years and over	747	355	925	866	798	439	870	653	859	814	921	354	740
62 years and over	674	317	832	767	704	374	789	573	767	752	835	308	687
Median	26.0	27.3	29.8	27.8	30.1	21.0	30.4	26.3	29.6	24.1	26.8	25.7	31.5
Female	**3 245**	**1 091**	**2 538**	**2 765**	**2 240**	**2 326**	**2 663**	**3 013**	**2 716**	**3 576**	**3 073**	**1 427**	**1 616**
Under 5 years	320	99	179	255	157	158	169	286	173	233	335	141	154
5 to 9 years	280	81	218	215	188	176	193	262	164	196	288	92	105
10 to 14 years	248	89	199	258	182	192	173	225	171	145	203	62	64
15 to 19 years	293	114	194	250	156	358	221	259	192	502	248	133	95
20 to 24 years	374	106	228	230	191	404	219	312	301	390	320	282	144
25 to 34 years	579	127	334	402	350	286	430	566	505	494	501	279	249
35 to 44 years	301	106	227	262	167	213	291	312	231	246	251	109	133
45 to 54 years	247	117	236	242	231	154	291	268	300	273	244	78	128
55 to 64 years	227	96	260	254	237	194	272	234	280	220	257	102	183
65 to 74 years	177	97	271	228	208	110	267	180	212	229	244	96	214
75 years and over	199	59	192	169	173	81	137	109	187	148	182	53	147
3 and 4 years	136	32	71	92	61	56	72	128	65	78	119	47	63
16 years and over	2 332	807	1 896	1 983	1 681	1 765	2 081	2 179	2 178	2 976	2 202	1 126	1 274
18 years and over	2 210	761	1 814	1 886	1 624	1 694	1 994	2 092	2 108	2 904	2 112	1 070	1 245
21 years and over	2 028	689	1 688	1 745	1 528	1 292	1 877	1 933	1 960	2 286	1 931	948	1 171
60 years and over	471	198	595	515	496	281	538	404	539	481	552	213	464
62 years and over	436	183	530	465	447	235	486	353	489	448	509	186	433
Median	26.6	28.4	31.7	28.8	31.8	22.4	32.5	27.3	31.2	23.7	27.1	25.1	34.8
HOUSEHOLD TYPE AND RELATIONSHIP													
Total persons	**6 654**	**2 127**	**4 642**	**5 206**	**4 250**	**4 251**	**5 119**	**5 780**	**4 900**	**7 431**	**6 049**	**3 086**	**3 110**
In households	6 608	2 122	4 624	5 206	4 250	3 365	5 119	5 680	4 665	5 751	6 049	3 086	3 034
Householder	2 243	791	1 852	1 941	1 758	1 289	2 076	2 053	1 781	2 381	2 112	1 315	1 199
Family householder	1 485	496	1 075	1 232	1 000	803	1 210	1 345	1 247	1 319	1 408	731	785
Nonfamily householder	758	295	777	709	758	486	866	708	534	1 062	704	584	414
Living alone	609	263	687	613	699	448	737	569	438	854	589	468	357
Spouse	1 134	245	419	567	442	244	650	640	733	974	1 120	551	651
Other relatives	2 828	1 007	2 165	2 465	1 899	1 727	2 064	2 630	1 954	1 847	2 570	961	1 034
Nonrelatives	403	79	188	233	151	105	329	357	197	549	247	259	150
Inmate of institution	-	-	-	-	-	-	-	97	235	-	-	-	18
Other, in group quarters	46	5	18	-	-	886	-	3	-	1 680	-	-	58
Persons per household	2.95	2.68	2.50	2.68	2.42	2.61	2.47	2.77	2.62	2.42	2.86	2.35	2.53
Persons per family	3.67	3.52	3.40	3.46	3.34	3.45	3.24	3.43	3.15	3.14	3.62	3.07	3.15
Persons 65 years and over	**569**	**268**	**719**	**645**	**602**	**305**	**640**	**474**	**627**	**634**	**689**	**257**	**574**
In households	569	267	719	645	602	305	648	407	426	633	689	257	541
Householder	387	207	555	458	457	256	445	274	258	449	475	156	378
Nonfamily householder	218	134	348	231	253	161	211	104	83	251	247	59	172
Living alone	198	124	320	215	241	156	184	96	73	245	232	57	164
Spouse	90	33	67	107	79	28	108	65	92	128	127	66	130
Other relatives	73	20	75	63	56	21	70	59	65	49	77	29	30
Nonrelatives	19	7	22	17	10	-	25	9	11	7	10	6	3
Inmate of institution	-	-	-	-	-	-	-	67	201	-	-	-	18
Other, in group quarters	-	1	-	-	-	-	-	-	-	1	-	-	15
FAMILY TYPE BY PRESENCE OF OWN CHILDREN													
Families	**1 485**	**496**	**1 075**	**1 232**	**1 000**	**803**	**1 210**	**1 345**	**1 247**	**1 319**	**1 408**	**731**	**785**
With own children under 18 years	828	265	525	661	473	477	536	759	575	586	759	332	346
Number of own children under 18 years	1 828	577	1 135	1 443	1 011	1 043	1 052	1 566	1 022	1 095	1 669	583	709
Married-couple families	**1 134**	**245**	**419**	**567**	**442**	**244**	**650**	**640**	**733**	**974**	**1 120**	**551**	**651**
With own children under 18 years	677	109	182	258	213	102	265	351	278	427	633	252	289
Number of own children under 18 years	1 547	242	358	559	448	208	519	709	481	827	1 418	464	600
Female householder, no husband present	**240**	**216**	**555**	**549**	**453**	**505**	**459**	**599**	**437**	**245**	**202**	**106**	**94**
With own children under 18 years	128	140	311	366	240	357	248	381	268	140	107	63	42
Number of own children under 18 years	244	303	717	827	523	790	496	813	499	243	213	99	81
MARITAL STATUS													
Male, 15 years and over	**2 470**	**740**	**1 529**	**1 712**	**1 448**	**1 400**	**1 912**	**1 969**	**1 662**	**3 353**	**2 187**	**1 375**	**1 143**
Single	870	274	630	627	563	912	738	845	550	1 940	676	541	305
Now married, except separated	1 312	268	480	605	494	290	725	721	795	1 083	1 247	636	707
Separated	57	66	142	179	118	76	148	147	92	99	54	69	29
Widowed	57	57	116	103	113	48	82	62	65	45	59	16	39
Divorced	174	75	161	198	160	74	219	194	160	186	151	113	63
Female, 15 years and over	**2 397**	**822**	**1 942**	**2 037**	**1 713**	**1 800**	**2 128**	**2 240**	**2 208**	**3 002**	**2 247**	**1 122**	**1 293**
Single	554	235	545	594	449	880	555	683	629	1 411	474	285	256
Now married, except separated	1 236	267	469	618	480	275	717	714	800	1 025	1 191	592	677
Separated	74	80	225	205	178	190	169	234	178	84	83	52	34
Widowed	329	151	465	365	387	231	342	290	334	267	303	108	227
Divorced	204	89	238	255	219	224	345	319	267	215	196	95	99

Table P-1. **General Characteristics of Persons: 1980**—Con.

[For meaning of symbols, see introduction. For definitions of terms, see appendixes A and B]

Census Tracts	Houston city (pt.), Harris County—Con.												
	Tract 0310	Tract 0311	Tract 0311.99	Tract 0312	Tract 0312.99	Tract 0313.01	Tract 0313.02	Tract 0314.01	Tract 0314.02	Tract 0315	Tract 0316.01	Tract 0316.02	Tract 0317.01
AGE													
Total persons	7 131	10 079	-	7 792	33	5 359	5 432	4 320	3 664	6 102	3 221	1 493	1 719
Under 5 years	312	127	-	309	-	571	534	418	341	433	412	23	110
5 to 9 years	687	1 089	-	827	-	431	470	392	329	477	169	20	42
10 to 14 years	654	988	-	748	-	362	437	452	203	460	156	37	27
15 to 19 years	758	1 098	-	771	12	462	394	471	283	526	208	53	24
20 to 24 years	876	970	-	838	13	649	518	398	397	616	428	492	320
25 to 34 years	1 164	1 568	-	1 265	4	1 028	988	687	786	1 057	928	380	663
35 to 44 years	630	966	-	772	2	491	468	551	317	664	350	119	157
45 to 54 years	649	916	-	678	-	351	416	447	303	722	311	95	90
55 to 64 years	461	561	-	533	2	392	481	278	318	486	218	85	112
65 to 74 years	274	454	-	342	-	398	456	152	188	344	148	99	101
75 years and over	166	242	-	209	-	224	270	74	99	317	93	90	73
3 and 4 years	309	468	-	337	-	204	213	171	168	171	73	6	26
16 years and over	4 837	6 657	-	5 272	33	3 931	3 922	2 959	2 651	4 633	2 646	1 409	1 538
18 years and over	4 554	6 212	-	4 951	29	3 746	3 781	2 773	2 547	4 413	2 572	1 385	1 529
21 years and over	4 036	5 590	-	4 461	18	3 421	3 515	2 504	2 332	4 089	2 422	1 311	1 498
60 years and over	625	975	-	787	2	825	995	331	432	850	331	227	233
62 years and over	553	840	-	681	2	749	891	278	366	762	294	209	199
Median	23.8	23.7	-	24.3	21.4	26.6	28.0	25.4	26.7	29.5	29.0	26.9	28.6
Female	3 362	4 880	-	3 647	17	2 684	2 828	2 246	1 739	3 249	1 456	868	743
Under 5 years	397	584	-	373	-	284	246	211	208	205	104	10	43
5 to 9 years	330	541	-	385	-	211	236	175	153	240	73	9	22
10 to 14 years	324	495	-	378	-	189	209	215	96	233	87	17	15
15 to 19 years	363	530	-	357	6	224	175	244	139	253	100	26	11
20 to 24 years	383	404	-	348	5	312	262	215	177	314	200	348	146
25 to 34 years	500	716	-	547	2	453	478	374	334	542	367	188	270
35 to 44 years	299	442	-	351	2	231	241	307	132	355	134	54	61
45 to 54 years	294	464	-	308	-	173	213	231	164	399	144	45	43
55 to 64 years	209	309	-	293	2	224	301	145	162	253	101	53	55
65 to 74 years	159	260	-	183	-	230	274	81	106	215	83	64	45
75 years and over	104	135	-	124	-	153	193	48	68	240	63	54	32
3 and 4 years	143	249	-	154	-	96	95	74	74	86	37	2	11
16 years and over	2 243	3 144	-	2 442	17	1 968	2 116	1 593	1 261	2 520	1 168	830	663
18 years and over	2 102	2 928	-	2 297	15	1 877	2 052	1 493	1 214	2 422	1 138	822	658
21 years and over	1 863	2 648	-	2 074	9	1 715	1 921	1 356	1 104	2 252	1 067	764	643
60 years and over	343	519	-	436	2	497	654	185	243	555	182	143	103
62 years and over	309	454	-	377	2	452	573	158	215	508	169	133	87
Median	23.5	23.5	-	24.7	21.5	27.4	30.5	26.4	27.3	31.4	28.9	25.6	28.4
HOUSEHOLD TYPE AND RELATIONSHIP													
Total persons	7 131	10 079	-	7 792	33	5 359	5 432	4 320	3 664	6 102	3 221	1 493	1 719
Households	7 125	10 065	-	7 780	-	5 258	5 432	4 320	3 650	5 818	2 998	639	1 611
Householder	2 057	2 718	-	2 152	-	1 894	1 847	1 376	1 314	2 111	1 414	389	898
Family householder	1 514	2 173	-	1 716	-	1 262	1 366	1 095	903	1 443	642	130	360
Nonfamily householder	543	545	-	436	-	632	481	281	411	668	772	259	538
Living alone	425	471	-	349	-	508	386	236	339	548	642	214	428
Spouse	1 188	1 714	-	1 349	-	1 040	1 003	705	737	913	371	112	304
Other relatives	3 511	5 318	-	3 919	-	2 090	2 265	2 120	1 440	2 541	970	59	263
Nonrelatives	369	315	-	360	-	234	317	119	159	253	243	79	146
Inmate of institution	-	-	-	-	-	-	-	-	-	127	131	233	74
Other, in group quarters	6	14	-	12	33	101	-	-	14	157	92	621	34
Persons per household	3.46	3.70	-	3.62	-	2.78	2.94	3.14	2.78	2.76	2.12	1.64	1.79
Persons per family	4.10	4.24	-	4.07	-	3.48	3.39	3.58	3.41	3.39	3.09	2.32	2.58
Persons 65 years and over	440	696	-	551	-	622	726	226	287	661	241	189	174
Households	440	696	-	551	-	621	726	226	287	455	166	147	131
Householder	294	455	-	369	-	417	484	139	197	307	120	107	95
Nonfamily householder	148	188	-	136	-	207	204	49	93	161	71	62	55
Living alone	141	179	-	128	-	197	183	45	87	154	63	61	52
Spouse	87	131	-	102	-	142	151	48	61	75	18	33	26
Other relatives	50	96	-	71	-	49	73	35	27	65	21	3	9
Nonrelatives	9	14	-	9	-	13	18	4	2	8	7	4	1
Inmate of institution	-	-	-	-	-	-	-	-	-	115	75	26	43
Other, in group quarters	-	-	-	-	-	1	-	-	-	91	-	16	-
FAMILY TYPE BY PRESENCE OF OWN CHILDREN													
Families	1 514	2 173	-	1 716	-	1 262	1 366	1 095	903	1 443	642	130	360
With own children under 18 years	969	1 375	-	1 036	-	650	679	667	479	757	314	22	128
Number of own children under 18 years	2 276	3 341	-	2 501	-	1 429	1 429	1 317	1 002	1 411	547	32	180
Married-couple families	1 188	1 714	-	1 349	-	1 040	1 003	705	737	913	371	112	304
With own children under 18 years	800	1 161	-	901	-	549	522	426	402	443	173	17	112
Number of own children under 18 years	1 916	2 858	-	2 205	-	1 216	1 159	859	830	801	321	25	161
Female householder, no husband present	227	295	-	241	-	162	292	308	122	443	200	11	33
With own children under 18 years	144	166	-	116	-	89	134	202	65	288	127	5	13
Number of own children under 18 years	302	360	-	262	-	184	236	394	147	564	208	7	16
MARITAL STATUS													
Male, 15 years and over	2 667	3 615	-	2 897	16	1 995	1 854	1 413	1 409	2 161	1 492	581	877
Single	893	1 165	-	977	16	627	546	483	450	825	693	335	384
Now married, except separated	1 515	2 025	-	1 699	-	1 150	1 097	738	811	1 011	467	154	389
Separated	94	154	-	53	-	41	50	65	38	101	102	23	20
Widowed	56	109	-	61	-	42	37	28	26	69	63	16	20
Divorced	109	162	-	107	-	135	124	99	84	155	167	53	64
Female, 15 years and over	2 311	3 260	-	2 511	17	2 000	2 137	1 645	1 282	2 571	1 192	832	663
Single	518	742	-	552	17	411	387	440	214	791	380	517	207
Now married, except separated	1 313	1 885	-	1 467	-	1 106	1 070	740	782	988	399	170	334
Separated	105	110	-	85	-	45	84	93	32	166	100	13	14
Widowed	241	340	-	274	-	276	388	119	141	354	156	70	41
Divorced	134	183	-	133	-	162	208	253	113	272	157	62	67

Table P-1. General Characteristics of Persons: 1980—Con.

[For meaning of symbols, see Introduction. For definitions of terms, see appendixes A and B]

Census Tracts	Houston city (pt.), Harris County—Con.												
	Tract 0321.01	Tract 0321.02	Tract 0321.03	Tract 0321.99	Tract 0322.01	Tract 0322.02	Tract 0322.03	Tract 0322.04	Tract 0323.01	Tract 0323.02	Tract 0324.01	Tract 0324.02	Tract 0324.03
AGE													
Total persons	**8 846**	**2 170**	**2 294**	**108**	**4**	**4 220**	**3 215**	**2 704**	**5 109**	**3 993**	**3 314**	**9 170**	**53**
Under 5 years	856	258	261	–	...	404	259	129	484	413	196	557	2
5 to 9 years	703	226	241	–	...	394	260	163	417	274	119	403	3
10 to 14 years	571	179	246	–	...	356	279	160	309	231	92	335	2
15 to 19 years	738	217	268	8	...	319	271	331	392	337	191	547	4
20 to 24 years	1 634	220	206	34	...	409	279	217	540	677	543	1 975	3
25 to 34 years	2 021	302	343	26	...	815	575	345	968	882	684	2 522	7
35 to 44 years	740	198	210	10	...	463	305	250	468	436	246	838	7
45 to 54 years	533	205	212	20	...	412	359	516	451	385	341	780	3
55 to 64 years	526	182	151	9	...	409	366	388	546	244	435	724	12
65 to 74 years	360	112	112	1	...	176	172	137	377	87	235	374	8
75 years and over	164	71	44	–	...	63	90	68	157	27	232	115	2
3 and 4 years	300	106	102	–	...	156	99	61	190	151	50	162	2
16 years and over	6 589	1 461	1 496	108	...	2 995	2 354	2 200	3 825	3 037	2 885	7 804	46
18 years and over	6 326	1 370	1 391	106	...	2 853	2 251	2 062	3 663	2 916	2 830	7 625	45
21 years and over	5 722	1 245	1 229	93	...	2 681	2 089	1 865	3 425	2 631	2 614	7 045	42
60 years and over	775	262	214	4	...	409	411	338	783	214	673	800	20
62 years and over	662	234	189	3	...	322	340	280	672	166	583	653	18
Median	24.8	24.7	22.8	29.5	...	27.2	28.6	35.4	28.7	25.5	31.4	26.9	37.8
Female	**4 144**	**1 033**	**1 083**	**18**	...	**2 124**	**1 638**	**1 333**	**2 589**	**1 924**	**1 746**	**4 467**	**18**
Under 5 years	419	124	122	–	...	204	131	59	242	207	98	293	1
5 to 9 years	360	106	119	–	...	182	120	85	219	147	65	212	1
10 to 14 years	269	76	118	–	...	173	131	78	150	120	46	161	–
15 to 19 years	388	104	115	4	...	155	130	148	179	177	104	321	1
20 to 24 years	723	111	83	8	...	225	159	89	286	313	259	1 004	–
25 to 34 years	810	132	158	3	...	396	266	156	432	374	310	1 078	4
35 to 44 years	298	99	108	1	...	216	150	138	223	206	123	347	3
45 to 54 years	286	102	101	–	...	224	202	281	228	193	193	390	1
55 to 64 years	272	81	77	2	...	209	183	180	303	115	239	381	2
65 to 74 years	203	60	50	–	...	97	102	72	221	52	129	209	4
75 years and over	116	38	32	–	...	43	64	47	106	20	180	71	1
3 and 4 years	142	53	49	–	...	78	43	25	99	82	25	89	1
16 years and over	3 040	702	705	18	...	1 528	1 217	1 086	1 940	1 430	1 525	3 765	16
18 years and over	2 894	659	651	16	...	1 460	1 177	1 026	1 877	1 367	1 495	3 658	16
21 years and over	2 588	602	588	12	...	1 376	1 098	943	1 761	1 226	1 369	3 313	15
60 years and over	450	137	111	2	...	225	243	180	455	115	414	440	7
62 years and over	390	121	96	2	...	178	208	155	400	95	362	361	7
Median	24.4	24.8	23.7	22.5	...	27.3	29.7	40.0	29.1	25.0	34.5	26.2	37.0
HOUSEHOLD TYPE AND RELATIONSHIP													
Total persons	**8 846**	**2 170**	**2 294**	**108**	**4**	**4 220**	**3 215**	**2 704**	**5 109**	**3 993**	**3 314**	**9 170**	**53**
In households	8 811	2 170	2 284	–	...	4 220	3 215	2 704	5 109	3 993	3 118	9 170	50
Householder	3 441	703	598	–	...	1 353	1 127	934	1 942	1 584	1 524	4 667	28
Family householder	1 998	460	501	–	...	1 137	875	791	1 339	1 021	846	2 340	11
Nonfamily householder	1 443	243	97	–	...	216	252	143	603	563	678	2 327	17
Living alone	1 137	213	79	–	...	180	229	117	523	416	553	1 937	16
Spouse	1 560	330	407	–	...	998	760	713	1 111	790	660	1 906	8
Other relatives	3 310	1 048	1 167	–	...	1 756	1 268	1 000	1 878	1 345	757	2 073	11
Nonrelatives	500	89	112	–	...	113	60	57	178	274	177	524	3
Inmate of institution	–	–	–	–	...	–	–	–	–	–	196	–	–
Other, in group quarters	35	–	10	108	...	–	–	–	–	–	–	–	3
Persons per household	2.56	3.09	3.82	–	...	3.12	2.85	2.90	2.63	2.52	2.05	1.96	1.79
Persons per family	3.44	4.00	4.14	–	...	3.42	3.32	3.17	3.23	3.09	2.67	2.70	2.73
Persons 65 years and over	**524**	**183**	**156**	**1**	...	**239**	**262**	**205**	**534**	**114**	**467**	**489**	**10**
In households	523	183	156	–	...	239	262	205	534	114	292	489	10
Householder	349	135	101	–	...	159	180	118	372	67	191	318	6
Nonfamily householder	152	75	36	–	...	56	84	32	172	31	78	129	2
Living alone	146	69	32	–	...	55	82	31	170	31	75	123	2
Spouse	102	27	33	–	...	49	61	61	116	24	69	115	4
Other relatives	66	10	15	–	...	27	20	21	45	22	31	48	–
Nonrelatives	6	11	7	–	...	4	1	5	1	1	1	8	–
Inmate of institution	–	–	–	–	...	–	–	–	–	–	175	–	–
Other, in group quarters	1	–	–	1	...	–	–	–	–	–	–	–	–
FAMILY TYPE BY PRESENCE OF OWN CHILDREN													
Families	**1 998**	**460**	**501**	**–**	...	**1 137**	**875**	**791**	**1 339**	**1 021**	**846**	**2 340**	**11**
With own children under 18 years	1 046	261	299	–	...	653	431	354	641	572	291	880	3
Number of own children under 18 years	2 249	648	772	–	...	1 239	881	600	1 302	954	442	1 396	7
Married-couple families	**1 560**	**330**	**407**	**–**	...	**998**	**760**	**713**	**1 111**	**790**	**660**	**1 906**	**8**
With own children under 18 years	837	203	254	–	...	574	372	311	539	433	201	638	2
Number of own children under 18 years	1 856	513	664	–	...	1 110	779	522	1 115	744	317	1 039	4
Female householder, no husband present	**296**	**98**	**55**	**–**	...	**105**	**96**	**52**	**165**	**165**	**146**	**316**	**2**
With own children under 18 years	171	48	28	–	...	59	51	31	86	113	81	206	1
Number of own children under 18 years	321	118	76	–	...	98	89	55	166	173	113	302	3
MARITAL STATUS													
Male, 15 years and over	**3 620**	**780**	**822**	**90**	...	**1 501**	**1 161**	**1 141**	**1 921**	**1 625**	**1 370**	**4 074**	**30**
Single	1 378	246	282	38	...	333	246	329	501	521	422	1 425	9
Now married, except separated	1 705	389	470	43	...	1 034	784	732	1 171	846	712	2 034	9
Separated	149	36	17	3	...	22	20	17	44	80	27	134	4
Widowed	53	37	19	–	...	20	20	17	31	10	51	48	1
Divorced	335	72	34	6	...	92	91	46	174	168	158	433	7
Female, 15 years and over	**3 096**	**727**	**724**	**18**	...	**1 565**	**1 256**	**1 111**	**1 978**	**1 450**	**1 537**	**3 801**	**16**
Single	726	151	152	17	...	233	171	219	306	276	307	998	3
Now married, except separated	1 659	357	438	–	...	1 032	785	730	1 153	812	698	1 965	8
Separated	115	51	26	–	...	30	21	20	45	74	48	112	1
Widowed	272	121	73	–	...	149	155	82	269	83	286	250	1
Divorced	324	47	35	1	...	121	124	60	205	205	198	476	3

Table P-1. **General Characteristics of Persons: 1980**—Con.

[For meaning of symbols, see introduction. For definitions of terms, see appendixes A and B]

Census Tracts	Houston city (pt.), Harris County—Con.												
	Tract 0373.02	Tract 0373.03	Tract 0373.04	Tract 0400.25	Tract 0400.26	Tract 0401.01	Tract 0401.02	Tract 0402.01	Tract 0402.02	Tract 0403	Tract 0404.01	Tract 0404.02	Tract 0405.01
AGE													
Total persons	9 444	3 332	1	1 150	6 874	2 324	3 472	5 829	4 076	6 757	2 699	3 675	4 141
Under 5 years	459	170	...	76	732	39	261	170	93	145	73	116	221
5 to 9 years	482	174	...	69	766	21	204	140	118	104	46	135	152
10 to 14 years	1 033	145	...	43	677	52	168	118	87	86	39	131	100
15 to 19 years	1 125	187	...	43	748	116	215	257	259	294	102	160	214
20 to 24 years	919	750	...	100	545	297	499	731	585	1 180	481	470	547
25 to 34 years	1 607	1 123	...	237	893	746	1 043	2 068	1 494	2 563	1 042	1 126	1 221
35 to 44 years	1 829	394	...	101	614	262	367	743	449	959	347	494	428
45 to 54 years	1 092	214	...	107	587	299	219	431	315	507	186	302	288
55 to 64 years	485	122	...	138	561	281	203	409	254	429	155	307	312
65 to 74 years	134	37	...	120	464	137	169	430	191	286	115	220	330
75 years and over	79	16	...	116	287	74	124	332	131	204	113	214	328
3 and 4 years	211	63	...	24	276	16	96	63	60	45	21	35	72
16 years and over	7 008	2 806	...	952	4 531	2 181	2 811	5 376	3 659	6 409	2 536	3 266	3 635
18 years and over	6 558	2 752	...	940	4 239	2 126	2 722	5 282	3 575	6 347	2 506	3 209	3 569
21 years and over	5 986	2 562	...	903	3 840	2 079	2 542	5 044	3 335	5 966	2 387	3 089	3 369
60 years and over	390	95	...	292	1 015	334	381	957	445	664	292	571	800
62 years and over	299	74	...	265	898	278	335	886	390	590	260	515	741
Median	28.0	26.4	...	35.6	24.7	32.3	28.0	31.4	29.6	30.2	29.5	31.6	30.8
Female	4 597	1 556	...	472	3 591	1 139	1 545	2 635	1 631	2 620	1 181	1 786	1 883
Under 5 years	236	84	...	30	334	18	125	86	113	70	39	53	111
5 to 9 years	321	95	...	24	372	5	101	74	55	52	19	76	65
10 to 14 years	493	68	...	22	344	18	91	63	39	35	19	66	44
15 to 19 years	518	99	...	23	370	42	101	101	121	159	45	70	98
20 to 24 years	448	370	...	35	283	160	207	312	211	506	231	247	242
25 to 34 years	797	485	...	82	460	335	383	815	505	820	411	496	418
35 to 44 years	918	167	...	27	338	111	133	237	136	261	115	202	151
45 to 54 years	504	93	...	33	311	162	93	202	120	196	75	119	125
55 to 64 years	221	57	...	61	313	164	106	241	122	203	79	157	175
65 to 74 years	87	27	...	59	259	77	115	280	121	174	65	153	216
75 years and over	54	11	...	76	207	47	90	224	88	144	83	147	238
3 and 4 years	113	38	...	10	113	6	56	40	39	27	10	15	33
16 years and over	3 426	1 291	...	391	2 462	1 091	1 220	2 404	1 414	2 459	1 102	1 579	1 648
18 years and over	3 218	1 258	...	381	2 305	1 075	1 179	2 368	1 380	2 426	1 089	1 559	1 615
21 years and over	2 947	1 157	...	367	2 119	1 047	1 090	2 268	1 275	2 226	1 025	1 497	1 530
60 years and over	217	61	...	163	616	198	257	627	275	406	185	375	540
62 years and over	173	54	...	151	552	164	232	587	241	366	167	347	513
Median	28.9	25.8	...	41.3	26.8	33.9	28.2	32.3	29.4	29.8	29.3	31.9	33.4
HOUSEHOLD TYPE AND RELATIONSHIP													
Total persons	9 444	3 332	1	1 150	6 874	2 324	3 472	5 829	4 076	6 757	2 699	3 675	4 141
In households	9 444	3 332	...	1 005	6 734	2 052	3 464	5 819	4 028	6 547	2 699	3 584	4 141
Householder	3 469	1 827	...	513	2 231	1 406	1 489	3 457	2 170	4 130	1 684	1 983	2 343
Family householder	2 382	763	...	182	1 393	374	639	1 044	650	932	429	731	810
Nonfamily householder	1 087	1 064	...	331	838	1 032	850	2 413	1 520	3 198	1 255	1 252	1 533
Living alone	879	878	...	286	749	918	596	1 870	1 083	2 447	932	1 021	1 279
Spouse	2 125	577	...	138	627	305	456	769	440	692	307	593	607
Other relatives	3 554	684	...	280	3 580	211	1 078	868	761	678	296	657	787
Nonrelatives	296	244	...	74	296	130	441	725	657	1 047	412	351	404
Inmate of institution	-	-	...	110	138	272	-	-	-	2	-	-	-
Other, in group quarters	-	-	...	35	2	-	8	10	48	208	-	91	-
Persons per household	2.72	1.82	...	1.96	3.02	1.46	2.33	1.68	1.86	1.59	1.60	1.81	1.77
Persons per family	3.38	2.65	...	3.30	4.02	2.38	3.40	2.57	2.85	2.47	2.41	2.71	2.72
Persons 65 years and over	213	53	...	236	751	211	293	762	322	490	228	434	658
In households	213	53	...	145	733	210	293	762	320	486	228	434	658
Householder	117	36	...	108	580	158	212	569	235	346	166	306	504
Nonfamily householder	61	24	...	71	383	105	133	353	140	220	108	176	335
Living alone	59	24	...	69	356	103	123	335	127	204	102	164	326
Spouse	37	8	...	24	66	31	41	140	46	76	35	86	112
Other relatives	55	9	...	10	63	19	34	38	25	51	21	33	34
Nonrelatives	4	-	...	3	24	2	6	15	14	13	6	9	8
Inmate of institution	-	-	...	90	18	1	-	-	-	-	-	-	-
Other, in group quarters	-	-	...	1	-	-	-	-	2	4	-	-	-
FAMILY TYPE BY PRESENCE OF OWN CHILDREN													
Families	2 382	763	...	182	1 393	374	639	1 044	650	932	429	731	810
With own children under 18 years	1 489	359	...	72	857	54	317	324	233	227	125	245	288
Number of own children under 18 years	2 791	526	...	183	2 201	96	667	469	392	349	167	418	500
Married-couple families	2 125	577	...	138	627	305	456	769	440	692	307	593	607
With own children under 18 years	1 318	224	...	59	378	39	236	222	151	157	79	193	200
Number of own children under 18 years	2 525	331	...	152	1 062	72	527	335	258	253	111	343	354
Female householder, no husband present	187	130	...	29	648	48	120	189	134	153	83	95	141
With own children under 18 years	141	110	...	11	431	14	59	86	60	60	38	39	72
Number of own children under 18 years	219	158	...	26	1 037	23	102	117	101	85	48	58	122
MARITAL STATUS													
Male, 15 years and over	3 723	1 534	...	546	2 158	1 114	1 611	2 989	2 254	3 959	1 437	1 702	2 005
Single	1 243	619	...	237	875	580	780	1 653	1 299	2 512	834	813	957
Now married, except separated	2 175	604	...	181	755	326	568	851	513	782	347	631	676
Separated	56	58	...	30	204	38	56	89	76	88	42	33	66
Widowed	21	6	...	46	149	20	27	53	44	60	17	28	44
Divorced	228	247	...	72	175	150	180	343	322	517	197	197	262
Female, 15 years and over	3 547	1 309	...	396	2 541	1 098	1 228	2 412	1 424	2 463	1 104	1 591	1 663
Single	873	375	...	81	780	443	340	784	472	1 042	433	529	416
Now married, except separated	2 161	596	...	156	731	311	509	808	486	739	325	629	639
Separated	66	33	...	16	260	29	32	77	67	54	21	36	48
Widowed	140	46	...	96	525	94	171	332	165	228	117	184	326
Divorced	307	259	...	47	245	221	176	411	234	400	208	213	234

Table P-1. **General Characteristics of Persons: 1980**—Con.

[For meaning of symbols, see introduction. For definitions of terms, see appendixes A and B]

Census Tracts	Houston city (pt.), Harris County—Con.												
	Tract 0449*	Tract 0450*	Tract 0451.02*	Tract 0501	Tract 0502	Tract 0503.01	Tract 0503.02	Tract 0504	Tract 0505.01	Tract 0505.02	Tract 0506.01	Tract 0506.02	Tract 0507.01
AGE													
Total persons	-	13	-	27	2 074	7 046	6 509	3 230	1 337	4 219	3 588	5 943	4 201
Under 5 years	-	...	-	-	206	736	549	323	129	356	352	395	326
5 to 9 years	-	...	-	-	227	719	553	342	36	377	204	372	300
10 to 14 years	-	...	-	-	220	735	588	280	79	344	157	292	315
15 to 19 years	-	...	-	2	202	739	718	283	96	449	293	411	278
20 to 24 years	-	...	-	3	191	674	713	359	163	448	388	549	341
25 to 34 years	-	...	-	2	249	1 120	932	522	352	505	835	1 454	831
35 to 44 years	-	...	-	5	159	622	629	297	122	431	353	563	394
45 to 54 years	-	...	-	6	198	548	645	277	88	419	245	457	359
55 to 64 years	-	...	-	1	179	542	502	280	90	357	246	450	365
65 to 74 years	-	...	-	6	164	357	305	165	79	283	245	443	383
75 years and over	-	...	-	1	79	254	175	102	53	150	170	457	309
3 and 4 years	-	...	-	-	76	290	241	138	42	144	118	129	114
16 years and over	-	...	-	26	1 371	4 728	4 489	2 234	1 030	3 061	2 840	4 810	3 202
18 years and over	-	...	-	26	1 306	4 436	4 211	2 120	991	2 889	2 742	4 670	3 089
21 years and over	-	...	-	24	1 182	3 974	3 743	1 924	919	2 599	2 501	4 371	2 915
60 years and over	-	...	-	8	335	869	693	404	174	503	537	1 118	882
62 years and over	-	...	-	8	292	751	594	344	162	521	488	1 010	821
Median	-	...	-	45.5	24.7	24.4	24.5	25.5	28.1	26.9	27.9	30.1	31.0
Female	-	...	-	15	1 071	3 528	3 071	1 484	660	1 943	1 771	3 035	2 173
Under 5 years	-	...	-	1	106	343	279	159	69	172	182	183	173
5 to 9 years	-	...	-	-	92	352	292	169	47	181	95	167	145
10 to 14 years	-	...	-	-	101	368	316	147	37	165	71	148	162
15 to 19 years	-	...	-	1	102	348	313	118	47	211	141	210	130
20 to 24 years	-	...	-	-	85	293	319	153	82	194	230	314	172
25 to 34 years	-	...	-	1	148	535	383	207	138	268	356	638	382
35 to 44 years	-	...	-	2	80	313	306	117	61	186	148	278	176
45 to 54 years	-	...	-	3	104	278	306	129	40	178	121	227	174
55 to 64 years	-	...	-	1	107	305	262	126	53	142	158	256	218
65 to 74 years	-	...	-	5	85	234	191	93	49	149	150	291	246
75 years and over	-	...	-	1	61	159	104	66	37	97	119	323	195
3 and 4 years	-	...	-	-	36	146	105	72	23	67	65	63	59
16 years and over	-	...	-	14	746	2 407	2 124	987	503	1 378	1 407	2 504	1 668
18 years and over	-	...	-	14	714	2 271	2 004	940	483	1 307	1 360	2 428	1 614
21 years and over	-	...	-	13	652	2 060	1 805	858	445	1 168	1 245	2 270	1 532
60 years and over	-	...	-	7	214	538	406	216	111	315	350	746	555
62 years and over	-	...	-	7	182	475	350	198	106	283	314	678	521
Median	-	...	-	54.8	27.7	25.8	25.3	24.8	27.6	26.7	28.7	31.9	32.6
HOUSEHOLD TYPE AND RELATIONSHIP													
Total persons	-	13	-	27	2 074	7 046	6 509	3 230	1 337	4 219	3 588	5 943	4 201
In households	-	...	-	27	2 055	7 018	6 427	3 051	1 337	4 007	3 588	5 858	4 193
Householder	-	...	-	9	697	2 060	1 703	905	502	1 220	1 508	2 557	1 650
Family householder	-	...	-	7	428	1 526	1 337	624	308	837	851	1 413	1 051
Nonfamily householder	-	...	-	2	269	534	366	281	194	383	657	1 144	599
Living alone	-	...	-	2	235	438	263	223	140	298	528	921	506
Spouse	-	...	-	1	183	1 065	963	409	240	548	635	1 107	841
Other relatives	-	...	-	17	1 074	3 582	3 334	1 544	483	1 982	1 176	1 820	1 535
Nonrelatives	-	...	-	-	101	311	427	193	112	257	269	374	167
Inmate of institution	-	...	-	-	-	-	51	179	-	-	-	62	-
Other, in group quarters	-	...	-	-	19	28	31	-	-	212	-	23	8
Persons per household	-	...	-	3.00	2.95	3.41	3.77	3.37	2.66	3.28	2.38	2.29	2.54
Persons per family	-	...	-	3.57	3.94	4.05	4.21	4.13	3.35	4.02	3.13	3.07	3.26
Persons 65 years and over	-	...	-	7	243	611	480	267	132	433	415	900	692
In households	-	...	-	7	235	611	463	266	132	410	415	853	692
Householder	-	...	-	5	174	433	303	195	89	290	306	629	490
Nonfamily householder	-	...	-	2	123	230	126	98	45	138	174	368	240
Living alone	-	...	-	2	112	220	109	90	41	127	166	350	234
Spouse	-	...	-	-	17	97	83	36	23	57	72	152	153
Other relatives	-	...	-	2	26	72	67	24	16	52	30	63	40
Nonrelatives	-	...	-	-	18	9	10	11	4	11	7	9	9
Inmate of institution	-	...	-	-	-	-	16	1	-	-	-	47	-
Other, in group quarters	-	...	-	-	8	-	1	-	-	23	-	-	-
FAMILY TYPE BY PRESENCE OF OWN CHILDREN													
Families	-	5	-	7	428	1 526	1 337	624	308	837	851	1 413	1 051
With own children under 18 years	-	2	-	-	243	933	790	368	146	435	389	593	470
Number of own children under 18 years	-	...	-	-	621	2 240	1 908	924	298	1 061	711	1 110	963
Married-couple families	-	5	-	1	183	1 065	963	409	240	548	635	1 107	841
With own children under 18 years	-	2	-	-	110	681	619	261	123	320	293	455	387
Number of own children under 18 years	-	...	-	-	265	1 739	1 546	684	253	793	545	872	810
Female householder, no husband present	-	-	-	5	215	358	267	153	49	215	154	232	157
With own children under 18 years	-	-	-	-	129	216	143	88	22	103	81	110	68
Number of own children under 18 years	-	...	-	-	348	441	306	205	43	244	138	199	124
MARITAL STATUS													
Male, 15 years and over	-	...	-	12	649	2 391	2 435	1 276	536	1 717	1 452	2 347	1 567
Single	-	...	-	8	273	876	959	460	182	601	487	817	448
Now married, except separated	-	...	-	3	223	1 248	1 217	556	284	707	733	1 198	919
Separated	-	...	-	-	52	62	106	93	9	139	46	54	40
Widowed	-	...	-	1	52	62	62	56	11	78	40	60	46
Divorced	-	...	-	-	49	143	91	111	50	192	146	218	114
Female, 15 years and over	-	...	-	14	772	2 465	2 184	1 009	507	1 425	1 423	2 537	1 693
Single	-	...	-	4	227	588	548	242	98	394	288	574	316
Now married, except separated	-	...	-	2	211	1 165	1 106	453	259	626	679	1 168	879
Separated	-	...	-	-	88	138	115	79	25	78	49	67	31
Widowed	-	...	-	6	179	334	278	155	78	207	209	439	320
Divorced	-	...	-	2	67	240	137	80	47	120	198	289	147

Table P-1. **General Characteristics of Persons: 1980**—Con.

[For meaning of symbols, see introduction. For definitions of terms, see appendixes A and B]

Census Tracts	Houston city (pt.), Harris County—Con.												
	Tract 0507.02	Tract 0508	Tract 0509.01	Tract 0509.02	Tract 0509.03	Tract 0510	Tract 0511	Tract 0512	Tract 0513	Tract 0514.01	Tract 0514.02	Tract 0515.01	Tract 0515.02
AGE													
Total persons	**5 187**	**5 539**	**3 118**	**3 155**	**6 079**	**4 776**	**6 810**	**7 581**	**3 402**	**3 776**	**2 192**	**4 913**	**2 785**
Under 5 years	374	268	279	277	390	405	570	508	265	260	206	355	230
5 to 9 years	413	504	277	256	439	404	503	462	306	281	190	328	139
10 to 14 years	379	477	220	277	406	388	450	413	212	280	184	273	142
15 to 19 years	433	585	287	364	512	435	538	536	227	286	218	323	184
20 to 24 years	542	616	299	341	507	455	731	806	409	460	268	573	416
25 to 34 years	881	943	552	447	983	603	1 273	1 635	577	686	340	940	841
35 to 44 years	489	487	281	279	530	352	677	686	295	350	187	502	280
45 to 54 years	481	498	271	310	575	447	498	586	243	301	191	419	238
55 to 64 years	502	411	284	280	705	518	618	621	278	297	183	475	190
65 to 74 years	343	287	207	215	641	474	609	649	268	277	156	491	103
75 years and over	250	163	151	109	291	295	343	579	222	198	69	234	52
3 and 4 years	175	216	101	103	181	158	207	230	114	131	61	104	73
16 years and over	3 834	3 883	2 272	2 273	4 670	3 500	5 197	6 001	2 569	2 800	1 573	3 909	2 271
18 years and over	3 666	3 643	2 173	2 115	4 467	3 313	4 972	5 808	2 479	2 698	1 486	3 787	2 198
21 years and over	3 371	3 256	1 993	1 923	4 138	3 043	4 590	5 425	2 199	2 471	1 339	3 539	2 075
60 years and over	825	638	484	444	1 305	1 022	1 262	1 542	627	625	298	976	242
62 years and over	742	564	429	400	1 175	910	1 142	1 419	569	562	262	872	211
Median	28.2	25.2	28.0	26.1	31.3	29.4	29.0	30.0	27.5	28.0	25.7	30.6	28.0
Female	**2 556**	**2 694**	**1 567**	**1 542**	**3 176**	**2 540**	**3 361**	**3 944**	**1 721**	**1 887**	**1 104**	**2 414**	**1 265**
Under 5 years	231	270	133	139	244	198	262	317	144	168	115	160	103
5 to 9 years	199	263	144	116	209	183	231	219	122	124	89	174	65
10 to 14 years	187	228	110	144	214	197	218	222	96	131	92	122	77
15 to 19 years	212	270	130	168	264	208	246	279	166	157	110	162	89
20 to 24 years	238	275	145	150	250	235	352	389	183	218	117	276	209
25 to 34 years	380	403	245	199	462	321	563	723	273	306	155	377	309
35 to 44 years	221	231	134	147	264	199	310	305	148	168	93	221	103
45 to 54 years	246	276	148	171	288	276	252	289	116	158	102	216	129
55 to 64 years	277	234	162	156	403	285	339	358	157	168	100	258	88
65 to 74 years	195	148	129	111	382	253	358	419	159	174	90	283	57
75 years and over	170	96	87	61	196	185	230	424	157	115	41	165	36
3 and 4 years	83	104	48	50	78	81	93	118	64	65	30	46	37
16 years and over	1 895	1 883	1 149	1 131	2 469	1 921	2 608	3 134	1 336	1 430	791	1 933	1 004
18 years and over	1 817	1 763	1 107	1 060	2 367	1 835	2 495	3 031	1 295	1 377	742	1 874	965
21 years and over	1 677	1 602	1 021	966	2 198	1 707	2 335	2 846	1 144	1 261	670	1 748	906
60 years and over	504	348	288	247	800	577	755	1 036	401	380	169	591	136
62 years and over	460	307	259	220	721	512	693	958	367	341	152	533	123
Median	29.5	25.9	29.0	27.9	33.3	32.3	30.3	31.8	29.4	29.3	26.5	32.6	27.2
HOUSEHOLD TYPE AND RELATIONSHIP													
Total persons	**5 187**	**5 539**	**3 118**	**3 155**	**6 079**	**4 776**	**6 810**	**7 581**	**3 402**	**3 776**	**2 192**	**4 913**	**2 785**
In households	5 187	5 536	3 118	3 155	6 079	4 776	6 810	7 581	3 008	3 776	2 192	4 858	2 756
Householder	1 848	1 684	1 072	969	2 181	1 722	2 512	3 351	1 083	1 384	739	2 072	1 358
Family householder	1 210	1 306	785	737	1 633	1 142	1 706	1 748	734	889	498	1 173	513
Nonfamily householder	638	378	287	232	548	580	806	1 603	349	495	241	899	845
Living alone	505	324	252	200	489	535	650	1 354	292	411	196	739	705
Spouse	967	948	632	489	1 360	628	1 347	1 378	578	638	303	898	402
Other relatives	2 069	2 695	1 331	1 611	2 393	2 293	2 613	2 383	1 221	1 557	1 018	1 604	779
Nonrelatives	303	209	83	86	145	133	338	469	126	197	132	284	217
Inmate of institution	-	-	-	-	-	-	-	-	115	-	-	45	22
Other, in group quarters	-	3	-	-	-	-	-	-	279	-	-	10	7
Persons per household	2.81	3.29	2.91	3.26	2.79	2.77	2.71	2.26	2.78	2.73	2.97	2.34	2.03
Persons per family	3.51	3.79	3.50	3.85	3.30	3.56	3.32	3.15	3.45	3.47	3.65	3.13	3.30
Persons 65 years and over	**593**	**450**	**358**	**324**	**932**	**769**	**952**	**1 228**	**490**	**475**	**225**	**725**	**155**
In households	593	450	358	324	932	769	952	1 228	393	475	225	724	150
Householder	417	310	248	216	600	556	663	948	287	333	164	493	110
Nonfamily householder	213	120	115	71	245	245	304	635	151	164	69	223	59
Living alone	203	115	112	67	237	231	292	608	140	154	67	206	57
Spouse	113	85	72	69	238	132	200	187	69	94	37	166	27
Other relatives	51	49	35	34	85	67	71	68	28	31	21	57	11
Nonrelatives	12	6	3	5	9	14	18	25	9	17	3	8	2
Inmate of institution	-	-	-	-	-	-	-	-	97	-	-	1	5
Other, in group quarters	-	-	-	-	-	-	-	-	-	-	-	-	-
FAMILY TYPE BY PRESENCE OF OWN CHILDREN													
Families	**1 210**	**1 306**	**785**	**737**	**1 633**	**1 142**	**1 706**	**1 748**	**734**	**889**	**498**	**1 173**	**513**
With own children under 18 years	591	746	400	368	715	498	792	771	344	422	254	451	231
Number of own children under 18 years	1 326	1 654	829	804	1 430	1 070	1 595	1 526	795	932	527	967	516
Married-couple families	**967**	**948**	**632**	**489**	**1 360**	**628**	**1 347**	**1 378**	**578**	**638**	**303**	**898**	**402**
With own children under 18 years	481	566	338	255	610	255	639	615	280	312	151	348	185
Number of own children under 18 years	1 082	1 284	703	566	1 269	541	1 318	1 249	668	716	333	770	426
Female householder, no husband present	**182**	**263**	**111**	**197**	**208**	**431**	**261**	**276**	**117**	**196**	**152**	**194**	**75**
With own children under 18 years	95	150	50	104	87	216	127	131	54	93	95	88	33
Number of own children under 18 years	217	317	102	220	137	477	236	236	108	187	183	176	70
MARITAL STATUS													
Male, 15 years and over	**1 902**	**2 057**	**1 152**	**1 182**	**2 235**	**1 617**	**2 637**	**2 912**	**1 260**	**1 391**	**806**	**1 999**	**1 284**
Single	650	750	325	469	568	576	819	957	459	472	287	663	566
Now married, except separated	1 104	1 090	692	540	1 437	685	1 486	1 506	626	697	377	1 019	456
Separated	50	71	30	59	43	107	92	83	33	56	40	66	62
Widowed	47	60	32	40	42	104	65	97	60	45	32	47	21
Divorced	131	86	73	74	145	145	175	269	82	121	68	204	179
Female, 15 years and over	**1 939**	**1 933**	**1 180**	**1 163**	**2 509**	**1 962**	**2 650**	**3 186**	**1 259**	**1 464**	**888**	**1 958**	**1 039**
Single	346	429	207	314	455	492	470	640	336	326	202	439	307
Now married, except separated	1 027	1 022	666	535	1 420	678	1 432	1 463	630	685	338	947	424
Separated	80	101	28	76	64	167	76	97	35	91	60	53	43
Widowed	285	241	183	149	398	395	430	668	250	207	123	313	96
Divorced	201	140	96	89	172	230	242	318	108	155	85	206	150

recycled paper

ecology and environment

RECORD OF COMMUNICATION	(Record of Item Checked Below) _X_Phone Call ___Discussion ___Field Trip ___Conference ___Other(Specify) Reference 11	
TO: Dr. Herbert McKee Occupational Health City of Houston Health Dept/Engineering (713) 640-4399	From: Kelly Bowles, FIT Geologist	Date: 1/9/89 Time: 2:25 pm

SUBJECT: Buffalo Bayou/Houston Ship Channel

SUMMARY OF COMMUNICATION

Q: Do you know what Buffalo Bayou is used for?

A: Buffalo Bayou is used for navigation and by industries along the channel for once through cooling water. There is no consumptive use and it is not used for drinking water.

Abridged from TXD008080715

CONCLUSIONS, ACTION TAKEN OR REQUIRED

INFORMATION COPIES TO: [illegible]

EPA FORM 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 which may be used until Supply is Exhausted.

RECORD OF COMMUNICATION	(Record of Item Checked Below) _x_Phone Call ___Discussion ___Field Trip ___Conference ___Other(Specify) Reference 12	
TO: Julie Massey Ecological Services U.S. Fish & Wildlife Service (713) 750-1700	From: Kelly Bowles FIT Geologist Kelly Bowles	Date: 1/19/89 Time: 2:10 p.m.

SUBJECT Sensitive Environments along Buffalo Bayou.

SUMMARY OF COMMUNICATION

Q. Are there any critical habitats of endangered species or other sensitive environments along Buffalo Bayou in the City of Houston?

A. No, there are no Federally designated critical habitats for endangered species along Buffalo Bayou. The edges of the Bayou are fairly industrialized, so there are no Federally designated sensitive environments along the banks.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

INFORMATION COPIES
TO:

EPA FORM 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 which may be used until Supply is Exhausted.

TC 17

RECORD OF COMMUNICATION	(Record of Item Checked Below) _x_Phone Call ___Discussion ___Field Trip ___Conference ___Other(Specify) Reference 13	
TO: Don McInnes Houston Public Works, Water Production office* (713) 227-6558	From: Kelly Bowles FIT Geologist Kelly Bowles	Date: 1/5/89 Time: 1:00 p.m.

SUBJECT Buffalo Bayou

SUMMARY OF COMMUNICATION

Q. What are the uses of Buffalo Bayou in the City of Houston?

A. Buffalo Bayou is primarily a stormwater outlet, with limited recreation uses. It is not used for irrigation and has no intakes. It is used in places for boating and canoeing.

Q. Is any of the surface water used as a public water supply?

A. In your area, surface water is not used as a public water supply.

*105 Sabine

Houston, Texas

CONCLUSIONS, ACTION TAKEN OR REQUIRED

INFORMATION COPIES
TO:

EPA FORM 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 which may be used until Supply is Exhausted.

REF 14

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
DALLAS, TEXAS

IN THE MATTER OF:

Houston-St.Louis Properties, Ltd. Palmer Warehouse & Transfer Company, Inc. RESPONDENTS REGARDING THE Palmer Warehouse Site Houston, Harris County, Texas Proceeding under §106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. §9606(a)), as amended.	§ §	ADMINISTRATIVE ORDER DOCKET NUMBER CERCLA-VI-06-88

ADMINISTRATIVE ORDER

This Administrative Order (ORDER) is issued to the above-named Respondents pursuant to Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 U.S.C. §9606(a) as amended, by authority delegated by the President of the United States in Executive Order 12580, 51 Fed. Reg. 2923 (January 29, 1987), to the Administrator of the United States Environmental Protection Agency (EPA) and redelegated to the Regional Administrator, Region VI. Notice of the issuance of this ORDER has been given to the State of Texas through the Texas Water Commission (TWC).

T6592-0001

The Regional Administrator has determined that there may be an imminent and substantial endangerment to the public health or welfare or the environment by releases or threatened releases of hazardous substances as defined in Section 101(14) of CERCLA, 42 U.S.C. §9601(14), from the facility known as the Palmer Warehouse Site, which is located in Houston, Harris County, Texas. This ORDER directs you to undertake action to protect the public health and welfare and the environment from this endangerment.

FINDINGS OF FACT

1. The site is located on 17.08 acres of land. The legal description of the site is as follows:

   BEGINNING at an iron pipe in the east right of way line of Lockwood Drive 100 foot right of way, 714.62 feet South 0° 48' 30" West of an iron rod marking the South right of way line of Sonora Street 50 foot right of way;
   THENCE South 89° 14' 30" East 826.21 feet to a concrete monument with 1/2" iron rod, on the West right of way line of T. & N. O. RR;
   THENCE South 0° 45' 30" West along the West right of way line of the T. & N. O. RR 716.93 feet to an iron pipe;
   THENCE continuing along the said West right of way line, along a curve to the right with raduis of 360 feet, intersection angle of 30° 29', chord South 16° 0' West 189.29 feet, a distance of 191.53 feet to an iron pipe;
   THENCE North 89° 14' 30" West 787.37 feet along the North side of a 15 foot sanitary sewer easement to an iron pipe in the East right of way line of Lockwood Drive;
   THENCE North 5° 18' 30" East 64.6 feet to an iron rod;
   THENCE continuing along said East right of way line of Lockwood Drive along a curve to the left with radius of 1687.02 feet intersection angle of 4° 30'a distance of 132.5 feet to an iron rod;
   THENCE continuing along the East right of way line of Lockwood Drive North 0° 48' 30" East 702.69 feet to the PLACE OF BEGINNING.

2. The site is an active facility that operates as a full distribution warehouse storing a variety of commodities for various client The site is located in a predominately residential area.

3. An inspection by the EPA Technical Assistance Team (TAT) documented that 63 drums of material are stored at the site (Attachment 1). The drums contain acetaldehyde, formaldehyde and alpha methyl styrene. Some of the drums contain unknown chemicals. The condition of the drums is deteriorating and are in generally poor condition.

4. Photographic and printing materials are also stored at the site. These materials contain potassium ferrocyanide, chrome alum, phosphoric acid, ammonium bichromate and ammonium hydroxide. Some of the containers have been damaged and are leaking.

5. Respondent Houston-St. Louis Properties, Ltd. is a Texas limited partnership comprised of George A. Shutt and New England Mutual Life Insurance Company.

6. As evidenced by the documents referred to below, Respondent Houston-St. Louis Properties, Ltd. is the current owner of the site:

Evidence

State of Texas
Special Warranty Deed 131-07-1424
Dated November 22, 1975

7. Respondent Palmer Warehouse & Transfer Company, Inc. is incorporated in the State of Texas.

8. As evidenced by the document referred to below, Respondent Palmer Warehouse & Transfer Company, Inc. is the operator of the site:

Evidence

~~Lease Agreement~~
~~Dated May 9, 1984~~

CONCLUSIONS OF LAW

9. The Respondents are "person"s as defined in Section 101(21) of CERCLA, 42 U.S.C. §9601(21).

10. The Site is a "facility" as defined in Section 101(9) of CERCLA, 42 U.S.C. §9601(9).

11. The substances found at the site are "hazardous substances" as defined in Section 101(14) of CERCLA, 42 U.S.C. §9601(14), and are subject to the terms and provisions of that act.

12. The spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of hazardous substances constitutes a "release" as defined in Section 101(22) of CERCLA, 42 U.S.C. §9601(22). The threat of any of the above constitutes the threat of a release.

13. As evidenced by the Findings of Fact numbered three (3) and four (4) the site poses the threat of a release of hazardous substances.

14. Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), imposes liability on:

a) the owner and operator of a vessel or a facility;

b) any person who at the time of disposal of any hazardous substance owned or operated any facility at which such hazardous substances were disposed of;

c) any person who by contract, agreement, or otherwise arranged for disposal or treatment, or arranged with a transporter for transport for disposal or treatment, of hazardous substances owned or possessed by such person, by any other party or entity, at any facility or incineration vessel owned or operated by another party or entity and containing such hazardous substances; and

d) any person who accepts or accepted any hazardous substances for transport to disposal or treatment facilities, incineration vessels or sites selected by such person;

from which there is a release, or a threatened release which causes the incurrence of response costs, of a hazardous substance.

15. The Respondents are liable, under Section 107(a) of CERCLA, for costs for responding to releases or threatened releases at the site because they own or operate the site.

16. The liability imposed by Section 107(a) of CERCLA, 42 U.S.C. §9607(a) extends to all costs incurred by the United States

Government, a State or Indian Tribe so long as the actions are not inconsistent with the National Contingency Plan (40 CFR Part 300), or any other person if the actions are consistent with the National Contingency Plan, in the taking of actions made necessary by a release, or the threat of a release, of hazardous substances into the environment. The liability also encompasses damages for injury to, destruction of, or loss of natural resources, including the reasonable costs of assessing such injury, destruction or loss. A person liable under Section 107(a) of CERCLA is also responsible for the costs incurred by the Agency for Toxic Substances and Disease Registry in assessing the potential risk to human health posed by exposure to hazardous substances the probable source of which was a release. The costs of actions taken in response to the health assessment are also the responsibility of persons liable under Section 107(a) of CERCLA. A person made liable by Section 107(a) may also be charged interest on the delayed payment of the enumerated costs.

Persons otherwise liable under Section 107(a) can become liable for punitive damages if they fail, without sufficient cause, to provide removal or remedial actions ordered of them, by a person authorized, pursuant to Section 104 or 106 of CERCLA (42 U.S.C. §9604, §9606).

DETERMINATIONS

17. The release or threat of release of the hazardous substances described in paragraphs 3 and 4 of this Order may present an

imminent and substantial endangerment to public health or welfare or the environment.

18. In order to protect human health, welfare and/or the environment, it is necessary that the actions described below be taken.

ON-SCENE COORDINATOR

19. The EPA has appointed an On-Scene Coordinator (OSC) who will be the designated representative for the EPA at the Site. The appointed OSC is Pat Hammack, who can be contacted at (214) 655-2270.

20. All decisions of EPA under this ORDER, including approvals, disapprovals, reports, workplans, specifications, schedules, and other work outputs, will be communicated to you by the EPA OSC. No formal or informal advice, guidance, suggestions, or comments by anyone other than the OSC regarding any activities undertaken in satisfaction of this ORDER shall relieve you of, or add to, obligations imposed by this ORDER. No informal guidance provided by the OSC is binding upon you. The OSC will differentiate between formal and informal guidance.

ORDER

21. Based on the foregoing Findings of Facts, Conclusions of Law, and Determinations, it is hereby Ordered and Directed that:

a. You shall, no later than three (3) business days after the effective date of this Order, contact Mr. John Meyer, whose address and telephone number are provided in paragraph thirty-four (34) below, and inform him of your intent to act or not to act as ordered. EPA will assume if the Respondents do not respond, that the Respondents refuse to perform the action. If you elect not to act you may be subject to penalties as explained in paragraph thirty-six (36). If you elect to act as ordered, you will proceed as follows:

b. You shall appoint no later than three (3) business days after the effective date of this Order, a Facility Coordinator who shall be responsible for this ORDER and the activities required herein. You shall notify EPA of the Facility Coordinator's identity and the address at which he may be contacted. Your Facility Coordinator shall coordinate and work with the EPA OSC.

c. You shall develop a Plan to undertake the following:

(i.) Sample and overpack the materials described in Attachment 1.

(ii.) Remove and properly dispose of the materials at a facility acceptable to the EPA OSC.

d. You shall, no later than fourteen (14) calendar days after the effective date of this ORDER, send the Plan with schedules for implementation to the EPA OSC.

e. Upon approval by the EPA, you shall implement the Plan in accordance with the schedule therein.

22. All actions taken pursuant to the ORDER shall be done in accordance with all applicable Federal and State laws and/or regulations.

23. You shall not, in any way, interfere with, obstruct, or undo efforts taken by any party to this ORDER.

24. EPA retains its right and power to take appropriate action, including enforcement action, to address any noncompliance by you with the terms of this ORDER, or to address any other event or occurrence not covered by this ORDER upon which EPA is empowered to act under any applicable law.

25. Compliance with this Order will not release any person from responsibilities to pay costs, recompensations, indemnifications or contributions, to undertake, or cause to be undertaken, response actions or other efforts of any nature not herein required but necessary to protect human health or the environment from releases or threats of release of hazardous substances arising from the Palmer Warehouse site.

DETERMINATION OF COMPLETION

26. This ORDER shall terminate when all actions required under paragraph twenty-one (21) have been successfully completed. You will be notified by the EPA OSC, in writing, when he has made that determination.

RECORD PRESERVATION

27. You shall preserve, during the pendency of this ORDER and for a minimum of six (6) years after the termination of this ORDER, all records and documents in your possession or in the possession of your divisions, employees, agents, or contractors, successors or assignees, prepared pursuant to or under the requirements of, or which in any way relate to, this ORDER, regardless of any document retention policy to the contrary.

28. You shall notify EPA thirty (30) calendar days prior to the destruction of any documents required to be kept pursuant to this section. Upon request by EPA, you shall make available, to EPA, the actual records or copies of the actual records required to be maintained pursuant to this paragraph.

OTHER CLAIMS

29. Nothing herein is intended to release any claims, causes of action or demands in law or equity against any person, firm, partnership, or corporation for any liability it may have to the United States, the State of Texas or any other person, firm, partnership, corporation or association arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous substances, hazardous wastes, solid wastes, pollutants, or contaminants found at, taken to, or taken from the Site.

30. This ORDER does not constitute any decision on preauthorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. §9611(a)(2).

LIABILITY OF EPA

31. Nothing herein is intended to be an assumption by EPA of liability for any claims or causes of action arising from, or on account of, your acts or omissions or acts or omissions of those under your control arising in connection with the carrying out of activities pursuant to this ORDER.

32. EPA will not be a party to any contract you might make in responding to this Order.

EFFECTIVE DATE - OPPORTUNITY TO CONFER

33. This ORDER is effective upon receipt thereof by you and all times for performance of response shall be calculated from that date.

34. You may make an oral request for a conference, followed by written notice, to the Regional Administrator. Such request must be received by the Regional Administrator within three (3) business days following your receipt of this ORDER. Address your request for a conference to:

Mr. John C. Meyer
U.S. Environmental Protection Agency
Superfund Compliance Section (6H-EC)
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 655-6730

35. At any conference held pursuant to your request, you may appear in person or by attorney or other representatives. At the conference, you or your representative, may present your analysis of technical feasibility of this ORDER, or you or your representative may offer evidence correcting any factual allegations made in this ORDER.

PENALTIES FOR NONCOMPLIANCE

36. Be advised that willful violations of, failure or refusal to comply with this ORDER, or any portion of it, may subject you, under §106(b) of CERCLA, 42 U.S.C. §9606(b), to a civil penalty of not more than $25,000 for each day in which such violation occurs or such failure to comply continues. Failure to comply with this ORDER, or any portion thereof, without sufficient cause, may subject you, under §107(c)(3) of CERCLA, 42 U.S.C. §9607(c)(3), to liability for punitive damages in an amount up to three times the costs incurred by the government as a result of your failure to take proper action.

Dated: June 22, 1988

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

BY: Robert E. Layton Jr.

Robert E. Layton Jr., P. E.
Regional Administrator
U.S. Environmental Protection Agency, Region VI

REF 15

TDD#: TC6-8810-22 DATE: 11-16-88
PAN#: TTX 0697 RPB
SITE: Palmer warehouse
1040 Lockwood
Houston, Tx.
Objective: Photodocument Removal of 63 drums abandoned by SCI Equipment & Technology in Palmer's Warehouse. The material is to be removed by Mohent, Inc., a chemical waste services company.

0830 TAT called Palmer Whse and spoke w/ Ed Seda - Mohent scheduled to be at site at 1300 hours. After Mohent's visit at Palmer Whse yesterday 11-15-88, Mohent will take all of the drummed material. Per Seda, Mohent transferred contents of the 4 salvage drums - yellow 85 Gallon Overpacs into 5 Gallon Containers yesterday, 11-15-88, Afternoon. There are 45 5-Gallon containers. Mr. Seda does not know what the contents of the 4 salvage drums are. TAT requested Seda to find out from Mohent. HLG

TDD: TC6-8810-22 DATE: 11-16-88
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Weather: Cold front moving in. Overcast, cool in 50°'s this morning and windy ~15-20 mph.

1200 TAT called Palmer. Heard from other TAT member that drums not yet removed from IDC Whse as of 1130 AM. Requested Ed Seda to check w/ Mohent, the transporter, to see if same crew will be used to pick up drums @ Palmer Whse - indicating scheduled Palmer drum pick up would be delayed.

1215 Ed Seda called TAT - Scheduling will be delayed. Pick up now scheduled for 2 pm or 1400 hours.

1325 TAT Depart office for Palmer Warehouse. Weather: Clear, Cool in upper 50's, Low 60°F. Still very windy ~10-15 mph

1355 Arrived at Palmer warehouse and met with Ed Seda. Drums had been moved to area along the south side of the 1040 Warehouse HLG

TDD: T06-8810-22 DATE: 11-16-88
PAN: TTX 0697RPB

adjacent to the office area & Ed Seda's office in the 1040 Lockwood warehouse b/dg. (this is to distinguish from previous location at the east end of the same b/dg which was designated as 1046 Lockwood as the area could be leased out as an office/warehouse facility.) Byron Nadeau had arrived at Palmer about 1350 hours from the IDC warehouse site, the truck was in position at the loading/unloading port.

1405 TAT began photodocumenting position & set up of drums to be removed. Photodocument also drums (empty) that were repackaged into 5 gallon plastic pail containers. There were 4 pallets of 11 and 12 pails. Several were smeared with a yellow/brown liquid on top and covered w/ plastic. There were 3 overpac drums (yellow) 80-85 gallon capacity. Two were identified as

AJG

TDD T06-8810-22 DATE 11-16-88
PAN TTX 0697RPB

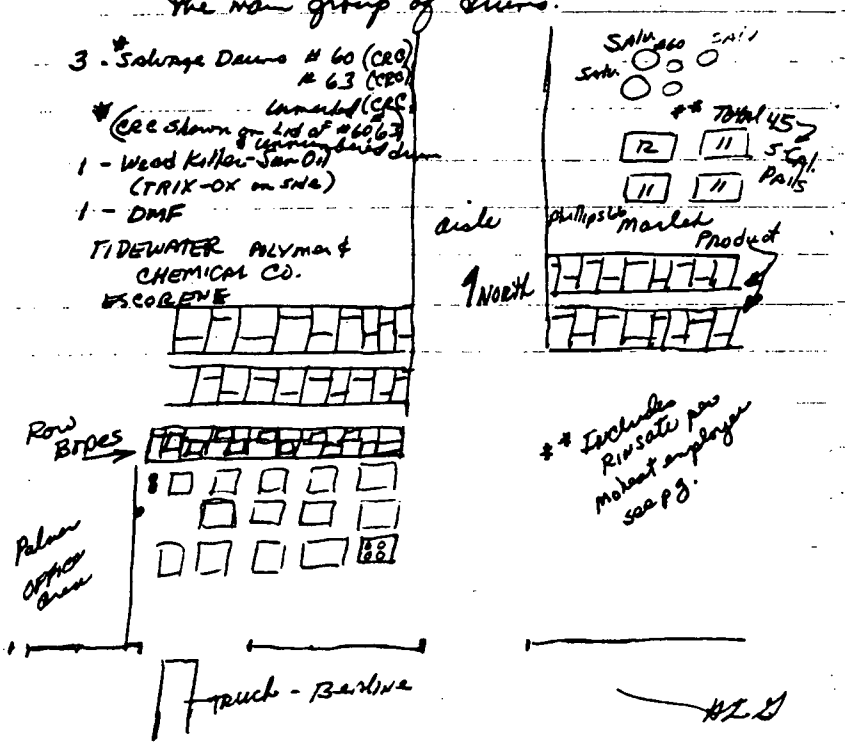
TATS previously inventoried #60 and #63 drums. One overpac was unmarked. On TATS initial inspection on 5-18-88, TAT inventoried 4 salvage drum overpacs. Two drums designated as #58 and #59 were not spray painted due to their unreachable position in between polypropylene product and set behind 4 other drums from aisle access. (See 5-18-88 Log, pg 7)

- TAT asked Ed Seda about the 4th salvage drum as it was not seen amongst the other drums ready to be moved into the truck. Mr Seda had no answer or rather his answer was that he did not know.
- There were also 2 other empty drums making 5 drums total that were according to Palmer repackaged into the 5 gallon plastic pails: 1 Drum DMF and 1 Drum Sun Oil - Weed Killer w/ TRIX ox on the drum. The Sun Oil

AJG

TDD TC6-8810-22 DATE 11-16-88
PAN TTC0697RPB

Weed Killer drum was designated as #57 and was set in the aisle along w/ the other unreadable drums on TATS 578-88 inspection. The DMF drum was drum #17, however the number on top of the drum was unreadable.
- TAT Diverting
- The above materials were set apart from the main group of drums.



HLG

TDD TC6-8810-22 DATE 11-16-88
PAN TTC0697RPB

1410 Met Dean McCuey, Bealine Service Co, Inc. 9717 Chemical Rd., Pasadena, Tx. 713-474-7772
Bealine is the transporter - Materials to be taken to Empak at Deer Park, Tx, Heat Energy Advanced Technology in Dallas, Tx and Morrie Shale Processors, Inc in Morgan City, Louisiana
Drums from IDC warehouse now on truck
4 drums to MSP in IDC Morgan City, La,
5 drums to Empak in Deer Pk, Tx
16 drums to Heat Energy A.T. in Dallas Tx.
Bijan Naderi of Mobeat checking spout-type caps on #4 and #8 Alpha-Methyl Styrene drums. Apparently Bealine can't transport them with this type top. Mr. Naderi taking off top of drums w/bung wrench(ks). Odor prevalent - TAT moved back to where 45 pails ready for pickup. The 2 drums were then "taped" to cover the openings.

HLG

TDD T06-8810-22 DATE: 11-16-88
PAN TTC 0697RPB

- TAT Asked Ed Seda what they planned to do with the 5 empty barrels. Seda stated that Bijan Naderi had washed them out. TAT Asked with what? Seda did not know. Seda indicated that Burbank Barrel and Drum would pay Palmer for them. TAT indicated these may still need to be disposed of as (w)hazardous waste.

1415 Palmer employee began unloading drums from IDC into Palmer Whse to be able to put all materials going to a facility in a grouped area of the trucl. Methanol and Xylene

1420 TAT requested drums being unloaded be put outside the warehouse. Naderi indicated only the Methanol and Xylene drums would be moved into the warehouse from the truck. Both materials are flammable w/explosive limits of Methanol in 52-58°F range, Xylene @ 81°F. Moved 2 of the 18 drums outside.

HYG

TDD T06-8810-22 DATE - 11-16-88
PAN TTC 0697RPB

1430 The 4 pallets of 45 plastic pails were loaded onto the truck.
IDC drums outside in addition to xylene and methanol were identified as Tergitol, Trichloroethane, drum #40 and drum #32.
- Loading began of Alpha-methyl styrene, Acetaldehyde and formaldehyde from aisle nearest truck.
- Moved Aerosol A-268 product off to side material to Empal - loaded last. See in new overpacs 17E/17H Dot R1054.
- Saw #52 drum HNO3 Trebacher loaded into truck not identified on site sheet today as for no location.

1545 Moved last of IDC drums back into truck. Took 2 Recovery Drums placed near truck against the west wall.
Loaded Aerosol A-268 drums. Documented 13 fiber barrels in overpacs.
- Ed Seda went to office to copy manifest for TAT/EPA.

HYG

TDD # T06-8810-22 DATE 11-16-88
PAN # TTX0697RPB

1525 Photodocument truck, Realine Service & Logo Flammable 223821 playground ◇

1530 - Document completion of loading truck. Forklift light on front of truck positioned @ back end of truck in place for light - Photo chemicals in truck.

- TAT spoke w/ Mobert employee who had been w/ Mobert for 2 weeks. He indicated the 45-5 Gallon pails of repacked chemicals included cresate used to rinse the 3 salvage drums, 1 DMF (dimethyl formamide) and 1 Sun Oil weed killer drum.

- Employee gave TAT Byham Valerie's Mobert business card.

- Dean McCray did not have a business card with him - but address shown on pg. 7.

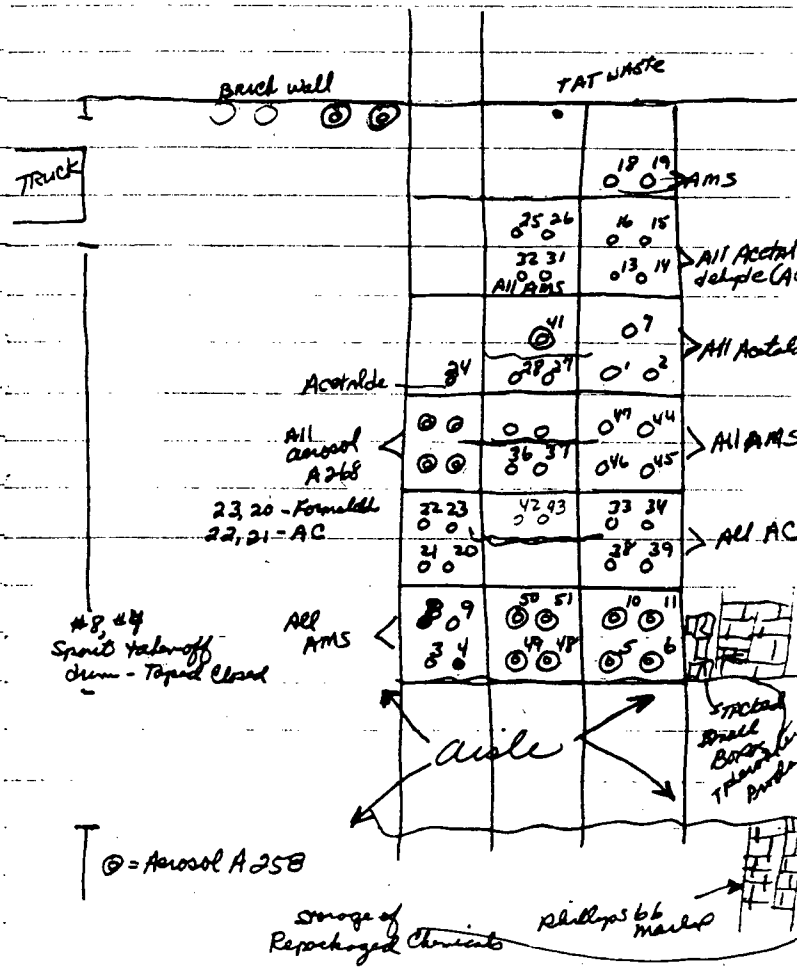
1545 - Photodocument truck as it was approaching Palmer exit gate.

1550 - TAT with Seda in his office. Seda gave TAT copy of manifest.

HGG

TDD # T06-8810-22 DATE: 11-16-88
PAN # TTX0697RPB

Ac = Acetaldehyde
AMS = Alpha methyl Styrene
F = Formaldehyde
⊙ = Aerosol A268



TDD #: T06-8810-22 DATE: 11-16-88
PAN #: TTO 0697 RFB

TAT reviewed manifest w/ TAT's 5-88 Inventory - did not match. Reviewed Mohsat's analysis sheets provided by Mr Sada. Error in Listing Aerosol #268 as 14 drums rather than 13. With this correction Mohsat sampled/analyzed 49 drums + 14 Alpha Methyl Styrene = 63 drum total count. Chemicals identified on Mohsat's analysis sheets did not match either TAT inventory list nor WASTE MANIFEST. TAT indicated this problem to Mr Sada. At Least 1 drum short if assume 5 drums formaldehyde shipped under acetaldehyde code and 5 drums of various chemicals (3 CRC Salvage, 1 DMF and 1 weed Killer) shipped as being included w/ Resate in the 45 5 gallon pails shipped as 2,4 dichlorophenoxy Acetic Acid. TAT went over the discrepancies w/ Ed Sada - TAT will get data together, try to get a hold of David

HLG.

TDD #: T06-8810-22 DATE: 11-16-88
PAN #: TTO 0697 RFB

Dodgen to inform him. Will get back w/ Ed Sada after talking w/ Dodgen
1710 TAT depart Palmer Warehouse.
1815 TAT arrive @ office
1845 TAT depart from office.

Holly L Gray

RECORD OF COMMUNICATION	(Record of Item Checked Below) x Phone Call ___Discussion ___Field Trip ___Conference ___Other(Specify) Reference 16	
TO: Don McInnes City of Houston Public Works	From: Brenda Nixon Cook BNC FIT Chemist	Date:2/17/89 Time:2:30 p.m.

SUBJECT Municipal drinking water wells located within 4 miles of the intersection of Clinton and Lockwood

SUMMARY OF COMMUNICATION

I called Mr. McInnes to see if there were any municipal wells within the study area. He gave me the following information:

Well Location	Key Map
1) Central 21, 1901 Memorial Drive	493K
2) Scott Street 3346	493Z
3) Northeast 3A-3156 Crawe	454W
4) Northeast 4 3111 Le Badie	454S
5) Northeast 5 3600 Kelly	454T
6) Northeast 6 6501 Tuscon	454P

CONCLUSIONS, ACTION TAKEN OR REQUIRED

INFORMATION COPIES
TO:

EPA FORM 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 which may be used until Supply is Exhausted.

EXPLANATION OF ZONE DESIGNATIONS
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CITY OF HOUSTON, TEXAS
HARRIS COUNTY, FORT BEND COUNTY, MONTGOMERY COUNTY
PANEL 125 OF 195
COMMUNITY-PANEL NUMBER
480296 0125 C
MAP REVISED:
SEPTEMBER 27, 1985
Federal Emergency Management Agency
REF 17
ZONE C
ZONE B
ZONE A11
ZONE A12
ZONE A14
ATHLETIC FIELD PARK
UNIVERSITY OF HOUSTON
TEXAS SOUTHERN UNIVERSITY
HERMANN PARK
EASTWOOD PARK
MASON PARK
FOREST PARK CEMETERY

REF. 18

United States Department of the Interior

GEOLOGICAL SURVEY

WATER RESOURCES DIVISION
2320 LaBranch St., Rm. 1112
Houston, Texas 77004

January 12, 1989

Kelly Bowles
Ecology and Environment
Suite 1400
1509 Main St.
Dallas, TX 75201

Dear Ms. Bowles:

Enclosed are tables of available daily mean discharge data at U.S.G.S. gaging station 08073700, Buffalo Bayou at Piney Point, TX.

Sincerely,

J. C. Fisher
Supervisory Hydrologist
Houston Subdistrict, WRD

JCF/bdp
Enclosures

T6382 123

DEPARTMENT OF THE INTERIOR - GEOLOGICAL SURVEY -

STATION NUMBE[redacted]08073700 BUFFALO BAYOU [redacted] PINEY POINT, TX STREAM
LATITUDE 294448 LONGITUDE 0953124 DRAINAGE AREA 317.00 DATUM
PROVISIONAL DATA

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO S
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
1	135	78	145	260	84	65	163	117
2	107	78	120	206	70	285	117	270
3	88	78	105	155	66	211	88	676
4	99	77	95	140	64	100	275	672
5	83	77	90	127	112	66	733	647
6	80	77	114	171	105	58	707	260
7	77	79	300	630	95	60	676	83
8	78	92	305	477	83	66	635	74
9	78	221	195	369	74	59	483	72
10	77	150	130	216	66	55	315	70
11	77	101	113	174	64	e54	102	66
12	78	85	101	157	63	e55	76	71
13	78	83	94	147	60	e63	71	67
14	77	79	88	142	61	e50	66	65
15	77	146	90	134	60	e49	63	64
16	77	658	85	166	59	e46	e79	65
17	77	455	82	162	59	585	92	64
18	77	362	83	138	132	1170	82	61
19	77	172	620	124	103	631	70	58
20	78	116	662	113	71	593	e60	60
21	77	94	1290	100	61	565	e59	283
22	77	86	491	e95	59	307	e58	303
23	86	85	725	e89	59	123	e55	120
24	108	82	680	e83	57	101	e52	82
25	89	494	649	e78	55	101	e48	67
26	82	445	625	e74	54	164	e46	60
27	80	559	834	e72	58	336	e48	58
28	78	444	637	74	60	219	55	54
29	84	294	549	68	69	141	700	62
30	77	181	335	67	---	746	447	64
31	78	---	213	67	---	741	---	65
TOTAL	2591	6028	10645	5075	2083	7865	6521	4800
MEAN	83.6	201	343	164	71.8	254	217	155
MAX	135	658	1290	630	132	1170	733	676
MIN	77	77	82	67	54	46	46	54
AC-FT	5140	11960	21110	10070	4130	15600	12930	9520

CAL YR 1987 TOTAL 116651 MEAN 320 MAX 1890 MIN 50 AC-FT 231400
WTR YR 1988 TOTAL 59405 MEAN 162 MAX 1290 MIN 46 AC-FT 117800

e Estimated

PINEY POINT, TX STREAM SOUR[illegible] AGENCY USGS
EA[illegible] 317.00 DATUM STATE 48 COUNTY 201
SUBJECT TO REVISION
ER YEAR OCTOBER 1987 TO SEPTEMBER 1988
VALUES

MAR	APR	MAY	JUN	JUL	AUG	SEP
65	163	117	64	62	108	68
285	117	270	62	57	197	71
211	88	676	779	53	284	98
100	275	672	103	110	233	64
66	733	647	107	167	180	61
58	707	260	252	124	155	59
60	676	83	533	90	140	57
66	635	74	300	82	150	52
59	483	72	114	81	119	52
55	315	70	69	75	318	51
e54	102	66	60	71	507	49
e55	76	71	55	67	399	71
e63	71	67	56	63	306	72
e50	66	65	56	60	140	66
e49	63	64	57	68	104	74
e46	e79	65	59	58	89	67
585	92	64	59	57	79	91
170	82	61	57	57	79	113
631	70	58	55	170	125	76
593	e60	60	87	97	126	57
565	e59	283	173	127	118	54
307	e58	303	114	133	96	51
123	e55	120	93	112	97	50
101	e52	82	76	102	89	51
101	e48	67	197	89	72	50
164	e46	60	83	96	65	54
336	e48	58	72	98	60	52
219	55	54	78	120	58	51
141	700	62	71	103	139	54
746	447	64	65	93	127	280
741	---	65	---	83	91	---
865	6521	4800	4006	2825	4850	2116
254	217	155	134	91.1	156	70.5
170	733	676	779	170	507	280
46	46	54	55	53	58	49
600	12930	9520	7950	5600	9620	4200

AC-FT 231400
AC-FT 117800

ECOLOGY + ENVIRONMENT, INC
REF 19
PC80-1-A45
Tex.
HA
215.T5
1980

CHARACTERISTICS OF THE POPULATION

Number of Inhabitants

TEXAS

1980 Census of Population

U.S. Department of Commerce
BUREAU OF THE CENSUS

1980 Census of Population

VOLUME 1
CHARACTERISTICS OF THE POPULATION

CHAPTER A

Number of Inhabitants

PART 45

TEXAS

PC80-1-A45

Issued March 1982

U.S. Department of Commerce
Malcolm Baldrige, Secretary
Joseph R. Wright, Jr.,
Deputy Secretary
Robert G. Dederick,
Assistant Secretary for
Economic Affairs

BUREAU OF THE CENSUS
Bruce Chapman,
Director

Data Index

This index provides a summary listing of the tables in which the particular data are presented. For a listing of the individual tables and their page numbers, see page 1.

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ble 2. Land Area and Population: 1930 to 1980

[Counts relate to counties as defined at each census. For meaning of symbols, see introduction]

ounties	1980 land area: Square miles	1980 land area: Square kilometers	Population 1980: Number	1980: Per square mile	1980: Per square kilometer	Percent change 1970 to 1980	Percent change 1960 to 1970	1970	1960	1950	1940	1930
e State	262 017	678 623	14 229 191	54.3	21.0	27.1	16.9	11 198 655	9 579 677	7 711 194	6 414 824	5 824 715
erson	1 077	2 789	38 381	35.6	13.8	38.1	-1 3	27 789	28 162	31 875	37 092	34 643
rews	501	3 888	13 323	8.9	3.4	28.5	-22.9	10 372	13 450	5 002	1 277	736
ewna	807	2 089	54 172	79 5	30.7	30.0	23.9	49 349	39 814	36 032	32 201	27 803
nsas	330	726	14 260	50.9	19.6	60.2	27.1	8 902	7 006	4 252	3 469	2 219
er	907	2 350	7 266	8.0	3.1	26.2	-5.7	5 759	6 110	6 816	7 599	9 684
strong	910	2 356	1 994	2.2	0.8	5.2	-3.6	1 895	1 966	2 215	2 495	3 329
scosa	1 218	3 154	25 055	20.6	7.9	34.0	-0.7	18 696	18 828	20 048	19 275	15 654
rin	656	1 698	17 726	27.0	10.4	28.2	0.4	13 831	13 777	14 663	17 384	18 860
ey	827	2 141	8 168	9.9	3.8	-3.8	-6.6	8 487	9 090	7 592	6 318	5 186
dera	793	2 053	7 084	8.9	3.5	49.2	22.0	4 747	3 892	4 410	4 234	3 784
rroo	895	2 318	24 726	27.6	10.7	42.9	2.2	17 297	16 925	19 622	21 610	23 888
or	862	2 233	4 919	5.7	2.2	-5.8	-11.4	5 221	5 893	6 875	7 755	7 418
	380	2 280	26 030	29.6	11.4	14.5	-4.3	22 737	23 755	18 174	16 481	15 721
	1 055	2 732	157 889	149.7	57.8	26.8	32.3	124 483	94 097	73 824	44 863	50 030
ar	1 248	3 232	988 800	792.3	305.9	19.1	20.9	830 460	687 151	500 460	338 176	292 533
co	714	1 848	4 681	6.6	2.5	31.2	-2.5	3 567	3 657	3 780	4 264	3 842
en	900	2 330	859	1.0	0.4	-3.3	-17.5	888	1 076	1 106	1 396	1 505
que	989	2 561	13 401	13.6	5.2	22.2	1.5	10 966	10 809	11 836	15 761	15 750
ne	891	2 307	75 301	84.5	32.6	9.3	14.9	68 909	59 971	61 966	50 208	48 563
ond	1 407	3 644	169 587	120.5	46.5	56.6	42.1	108 312	76 204	46 549	27 069	23 054
cas	588	1 524	93 588	159.2	61.4	61.4	29.1	57 978	44 895	38 390	26 977	21 835
vster	6 169	15 977	7 573	1.2	0.5	-2.7	20.9	7 780	6 434	7 309	6 478	6 624
coe	387	2 298	2 579	2.9	1.1	-7.7	-21.9	2 794	3 577	3 528	4 056	5 590
cks	942	2 439	8 428	8.9	3.5	5.3	-7.0	8 005	8 609	9 195	6 362	5 901
vn	936	2 424	33 057	35.3	13.6	27.7	4.6	25 877	24 728	28 607	25 924	26 382
eson	568	1 731	12 313	18.4	7 1	23.1	-10.5	9 999	11 177	13 000	18 334	19 848
et	994	2 575	17 803	17.9	6.9	55.9	23.3	11 420	9 265	10 356	10 771	10 355
well	546	1 413	23 637	43.3	16.7	11.6	23.0	21 178	17 222	19 350	24 893	31 397
oun	540	1 399	19 574	36.2	14.0	9.8	7.5	17 831	16 592	9 222	5 911	5 385
nan	899	2 329	10 992	12.2	4.7	34.0	3.5	8 205	7 929	9 087	11 568	12 785
eron	905	2 345	209 727	231.7	89.4	49.4	-7.1	140 368	151 098	125 170	83 202	77 540
o	203	525	9 275	45.7	17.7	15.9	2.0	8 005	7 849	8 740	10 285	10 063
on	924	2 392	6 672	7.2	2.8	4.9	-18.3	6 358	7 781	6 852	6 624	7 745
s	937	2 426	29 430	31.4	12.1	21.9	2.7	24 133	23 496	26 732	33 496	30 030
ro	899	2 329	10 556	11.7	4.5	1.6	16.5	10 394	8 923	5 417	4 631	4 720
nbers	616	1 596	18 538	30.1	11.6	52.1	17.4	12 187	10 379	7 871	7 511	5 710
okee	1 052	2 725	38 127	36.2	14.0	19.1	-3.4	32 008	33 120	38 694	43 970	43 180
ress	707	1 831	6 950	9.8	3.8	5.2	-21.6	6 605	8 421	12 123	12 149	16 044
	1 085	2 811	9 582	8.8	3.4	18.6	-3.3	8 079	8 351	9 896	12 524	14 545
nan	775	2 006	4 825	6.2	2.4	-9.4	-17.0	5 326	6 417	5 928	3 735	1 963
	908	2 352	3 196	3.5	1.4	3.5	-14.0	3 087	3 589	4 045	4 590	5 253
man	1 277	3 308	10 439	8.2	3.2	1.5	-17.4	10 288	12 458	15 503	20 571	23 669
n	851	2 205	144 576	169.9	65.6	116.0	62.2	66 920	41 247	41 692	47 190	46 180
ngsworth	909	2 354	4 648	5.1	2.0	-2.3	-24.2	4 755	6 276	9 139	10 331	14 461
rado	964	2 498	18 823	19.5	7.5	6.7	-4.5	17 638	18 463	17 576	17 812	19 129
al	555	1 438	36 446	65.7	25.3	50.8	21.8	24 165	19 844	16 357	12 321	11 984
anche	930	2 409	12 617	13.6	5.2	6.0	0.3	11 898	11 865	15 516	19 245	18 430
ho	992	2 570	2 915	2.9	1.1	-0.7	-20.0	2 937	3 672	5 078	6 192	7 645
e	893	2 312	27 656	31.0	12.0	17.8	4.0	23 471	22 560	22 146	24 909	24 136
el	1 057	2 737	56 767	53.7	20.7	60.8	47.4	35 311	23 961	16 284	20 226	19 999
e	895	2 319	2 947	3.3	1.3	-8.0	-23.8	3 204	4 207	6 099	7 079	9 395
e	782	2 026	4 600	5.9	2.3	10.3	-11.2	4 172	4 699	3 965	2 841	2 221
ett	2 806	7 268	4 608	1.6	0.6	18.6	-7.7	3 885	4 209	3 981	2 809	2 590
ov	898	2 327	8 859	9.9	3.8	-2.5	-12.2	9 085	10 347	9 582	10 046	11 023
erson	3 815	9 880	3 315	0.9	0.3	-3.3	22.7	3 429	2 794	1 825	1 653	1 228
m	1 505	3 899	6 531	4.3	1.7	8.6	-4.6	6 012	6 302	7 640	6 494	7 830
s	880	2 279	1 556 390	1768.6	682.9	17.2	39.5	1 327 695	951 527	614 799	398 564	325 691
son	903	2 338	16 184	17.9	6.9	-2.5	-13.5	16 604	19 185	19 113	15 367	13 573
Smith	1 497	3 878	21 165	14.1	5.5	11.4	44.1	18 999	13 187	9 111	6 056	5 979
	278	720	4 839	17.4	6.7	-1.8	-15.9	4 927	5 860	8 964	12 858	13 138
on	911	2 359	143 126	157.1	60.7	89.2	59.5	75 633	47 432	41 365	33 658	32 822
iff	910	2 358	18 903	20.8	8.0	1.3	-9.8	18 660	20 683	22 973	24 935	27 441
ns	907	2 348	3 539	3.9	1.5	-5.3	-24.7	3 737	4 963	7 177	7 847	8 601
nt	1 307	3 386	11 367	8.7	3.4	25.8	-10.5	9 039	10 095	10 654	8 542	8 828
y	929	2 406	4 075	4.4	1.7	11.9	-18.2	3 641	4 449	6 216	7 487	10 262
	1 795	4 649	12 517	7.0	2.7	6.8	-12.5	11 722	13 398	15 643	20 565	12 191
nd	924	2 394	19 480	21.1	8.1	7.7	-7.3	18 092	19 526	23 942	30 345	34 156
	903	2 340	115 374	127.8	49.3	24.5	1.8	92 660	90 995	42 102	15 051	3 958
rds	2 120	5 492	2 033	1.0	0.4	-3.5	-9.1	2 107	2 317	2 908	2 933	2 764
	939	2 432	59 743	63.6	24.6	28.1	7.5	46 638	43 395	45 645	47 733	53 936
so	1 014	2 626	479 899	473.3	182.7	33.6	14.4	359 291	314 070	194 968	131 067	131 597
	1 080	2 796	22 560	20.9	8.1	24.4	11.7	18 141	16 236	18 434	20 760	20 804
	770	1 995	17 946	23.3	9.0	3.7	-18.6	17 300	21 263	26 724	35 984	38 771
n	895	2 318	24 285	27.1	10.5	7.0	-4.9	22 705	23 880	31 253	41 064	41 163
re	950	2 460	18 832	19.8	7.7	6.7	-13.4	17 650	20 384	24 176	29 246	30 708
	897	2 322	5 891	6.6	2.5	-7.1	-19.3	6 344	7 865	11 023	12 932	13 563
	992	2 570	9 834	9.9	3.8	-11.0	-10.7	11 044	12 369	10 535	10 659	12 409
	703	1 821	2 158	3.1	1.2	-2.4	-29.2	2 211	3 125	4 216	5 237	6 315
end	876	2 268	130 846	149.4	57.7	150.1	29.1	52 314	40 527	31 056	32 963	29 718
n	294	762	6 893	23.4	9.0	30.3	3.7	5 291	5 101	6 257	8 378	8 494
one	888	2 300	14 830	16.7	6.4	33.4	-11.2	11 116	12 525	15 696	21 138	22 589
	1 133	2 934	13 785	12.2	4.7	23.5	10.4	11 159	10 112	10 357	9 207	9 411
	1 504	3 895	13 150	8.7	3.4	13.4	-5.5	11 593	12 267	8 909	8 136	2 800
ston	399	1 033	195 940	491.1	189.7	15.4	21.0	169 812	140 364	113 066	81 173	64 401
	895	2 317	5 336	6.0	2.3	0.9	-20.0	5 289	6 611	6 281	5 678	5 586
e	1 061	2 749	13 532	12.8	4.9	28.2	5.0	10 553	10 048	10 520	10 670	11 020
ock	900	2 332	1 304	1.4	0.6	12.9	3.3	1 155	1 118	1 089	1 193	1 263
	859	2 224	5 193	6.0	2.3	6.7	-10.3	4 869	5 429	6 219	8 798	10 093
es	1 068	2 765	16 883	15.8	6.1	3.1	-8.2	16 375	17 845	21 164	26 075	28 337
	921	2 385	26 386	28.6	11.1	-2.1	-14.5	26 949	31 535	24 728	23 911	22 090
n	934	2 419	89 796	96.1	37.1	7.9	13.9	83 225	73 043	70 467	69 499	65 843

Table 2. **Land Area and Population: 1930 to 1980**—Con.

[Counts relate to counties as defined at each census. For meaning of symbols, see introduction]

Counties	1980 land area: Square miles	1980 land area: Square kilometers	Population 1980: Number	1980: Per square mile	1980: Per square kilometer	Percent change: 1970 to 1980	Percent change: 1960 to 1970	1970	1960	1950	1940	1930
Gregg	273	707	99 487	364.4	140.7	31.0	9.4	75 929	69 436	61 258	58 027	45 778
Grimes	799	2 070	13 580	17.0	6.6	14.6	-6.7	11 855	12 709	15 135	21 960	22 642
Guadalupe	713	1 847	46 708	65.5	25.3	39.2	15.6	33 554	29 017	25 392	25 596	28 925
Hale	1 005	2 604	37 592	37.4	14.4	10.1	-7.2	34 137	36 798	28 211	18 813	20 189
Hall	876	2 270	5 594	6.4	2.5	-7.0	-17.9	6 015	7 322	10 930	12 117	16 966
Hamilton	836	2 165	8 297	9.9	3.8	15.3	-15.2	7 198	8 488	10 660	13 303	13 523
Hansford	921	2 385	6 209	6.7	2.6	-2.2	2.3	6 351	6 208	4 202	2 783	3 548
Hardeman	688	1 782	6 368	9.3	3.6	-6.3	-17.9	6 795	8 275	10 212	11 073	14 532
Hardin	898	2 326	40 721	45.3	17.5	35.8	21.8	29 996	24 629	19 535	15 875	13 936
Harris	1 734	4 492	2 409 547	1389.6	536.4	38.3	40.1	1 741 912	1 243 158	806 701	528 961	359 328
Harrison	908	2 353	52 265	57.6	22.2	16.6	-1.7	44 841	45 594	47 745	50 900	48 937
Hartley	1 462	3 786	3 987	2.7	1.1	43.3	28.1	2 782	2 171	1 913	1 873	2 185
Haskell	901	2 333	7 725	8.6	3.3	-9.2	-23.8	8 512	11 174	13 736	14 905	16 669
Hays	678	1 757	40 594	59.9	23.1	46.9	38.7	27 642	19 934	17 840	15 349	14 915
Hemphill	903	2 338	5 304	5.9	2.3	72.0	-3.2	3 084	3 185	4 123	4 170	4 637
Henderson	888	2 301	42 606	48.0	18.5	61.0	21.5	26 466	21 786	23 405	31 822	30 583
Hidalgo	1 569	4 064	283 229	180.5	69.7	56.0	0.3	181 535	180 904	160 446	106 059	77 004
Hill	968	2 508	25 024	25.9	10.0	10.7	-4.5	22 596	23 650	31 282	38 355	43 036
Hockley	908	2 351	23 230	25.6	9.9	13.9	-8.7	20 396	22 340	20 407	12 693	9 298
Hood	425	1 101	17 714	41.7	16.1	178.2	17.0	6 368	5 443	5 287	6 674	6 779
Hopkins	789	2 044	25 247	32.0	12.4	21.9	11.4	20 710	18 594	23 490	30 274	29 410
Houston	1 234	3 197	22 299	18.1	7.0	24.9	-7.8	17 855	19 376	22 825	31 137	30 017
Howard	901	2 334	33 142	36.8	14.2	-12.3	-5.8	37 796	40 139	26 722	20 990	22 888
Hudspeth	4 566	11 827	2 728	0.6	0.2	14.0	-28.4	2 392	3 343	4 298	3 149	3 728
Hunt	840	2 176	55 248	65.8	25.4	15.2	21.7	47 948	39 399	42 731	48 793	49 016
Hutchinson	871	2 257	26 304	30.2	11.7	7.6	-29.0	24 443	34 419	31 580	19 069	14 848
Irion	1 052	2 724	386	1.3	0.5	29.5	-9.6	1 070	1 183	1 590	1 963	2 049
Jack	920	2 382	7 408	8.1	3.1	10.4	-9.5	6 711	7 418	7 755	10 206	9 046
Jackson	844	2 185	13 352	15.8	6.1	2.9	-7.6	12 975	14 040	12 916	11 720	10 980
Jasper	921	2 386	30 781	33.4	12.9	24.7	11.7	24 692	22 100	20 049	17 491	17 064
Jeff Davis	2 258	5 847	1 647	0.7	0.3	7.9	-3.5	1 527	1 582	2 090	2 375	1 800
Jefferson	937	2 428	250 938	267.8	103.4	1.8	0.3	246 402	245 659	195 083	145 329	133 391
Jim Hogg	1 136	2 943	5 168	4.5	1.8	11.0	-7.3	4 654	5 022	5 389	5 449	4 919
Jim Wells	867	2 245	36 498	42.1	16.3	10.5	-4.4	33 032	34 548	27 991	20 239	13 456
Johnson	731	1 892	67 649	92.5	35.8	47.8	31.8	45 769	34 720	31 390	30 384	33 317
Jones	931	2 410	17 268	18.5	7.2	7.2	-16.5	16 106	19 299	22 147	23 378	24 233
Karnes	753	1 951	13 593	18.1	7.0	1.0	-10.2	13 462	14 995	17 139	19 248	23 316
Kaufman	788	2 042	39 015	49.5	19.1	20.4	8.2	32 392	29 931	31 170	38 308	40 905
Kendall	663	1 717	10 635	16.0	6.2	52.7	18.3	6 964	5 889	5 423	5 080	4 970
Kenedy	1 389	3 598	543	0.4	0.2	-19.9	-23.3	678	884	632	700	701
Kent	878	2 275	1 145	1.3	0.5	-20.2	-17.0	1 434	1 727	2 249	3 413	3 851
Kerr	1 107	2 867	28 780	26.0	10.0	47.9	15.8	19 454	16 800	14 022	11 650	10 151
Kimble	1 250	3 237	4 063	3.3	1.3	4.1	-1.0	3 904	3 943	4 619	5 064	4 119
King	914	2 367	425	0.5	0.2	-8.4	-27.5	464	640	870	1 066	1 193
Kinney	1 359	3 519	2 279	1.7	0.6	13.6	-18.2	2 006	2 452	2 668	4 533	3 980
Kleberg	853	2 209	33 358	39.1	15.1	0.6	10.4	33 166	30 052	21 991	13 344	12 451
Knox	845	2 189	5 329	6.3	2.4	-10.8	-24.0	5 972	7 857	10 082	10 090	11 368
Lamar	919	2 381	42 156	45.9	17.7	16.9	5.3	36 062	34 234	43 033	50 425	48 529
Lamb	1 013	2 623	18 669	18.4	7.1	5.1	-18.8	17 770	21 896	20 015	17 606	17 452
Lampasas	714	1 850	12 005	16.8	6.5	28.8	-1.0	9 323	9 418	9 929	9 167	8 677
La Salle	1 517	3 929	5 514	3.6	1.4	10.0	-16.0	5 014	5 972	7 485	8 003	8 228
Lavaca	971	2 515	19 004	19.6	7.6	6.1	-11.3	17 903	20 174	22 159	25 485	27 550
Lee	631	1 634	10 952	17.4	6.7	36.1	-10.1	8 048	8 949	10 144	12 751	13 390
Leon	1 078	2 793	9 594	8.9	3.4	9.8	-12.2	8 738	9 951	12 024	17 733	19 898
Liberty	1 174	3 040	47 088	40.1	15.5	42.6	4.5	33 014	31 595	26 729	24 541	19 868
Limestone	931	2 410	20 224	21.7	8.4	11.7	-11.3	18 100	20 413	25 251	33 781	39 497
Lipscomb	933	2 417	3 766	4.0	1.6	8.0	2.3	3 486	3 406	3 658	3 764	4 512
Live Oak	1 057	2 737	9 606	9.1	3.5	43.4	-14.6	6 697	7 846	9 054	9 799	8 956
Llano	939	2 432	10 144	10.8	4.2	45.4	33.2	6 979	5 240	5 377	5 996	5 538
Loving	671	1 737	91	0.1	0.1	-44.5	-27.4	164	226	227	285	195
Lubbock	900	2 331	211 651	235.2	90.8	18.0	14.7	179 295	156 271	101 048	51 782	39 104
Lynn	888	2 300	8 605	9.7	3.7	-5.5	-16.6	9 107	10 914	11 030	11 931	12 372
McCulloch	1 071	2 775	8 735	8.2	3.1	1.9	-2.8	8 571	8 815	11 701	13 208	13 883
McLennan	1 031	2 669	170 755	165.6	64.0	15.7	-1.7	147 553	150 091	130 194	101 898	98 682
McMullen	1 163	3 012	789	0.7	0.3	-27.9	-1.9	1 095	1 116	1 187	1 374	1 351
Madison	473	1 224	10 649	22.5	8.7	38.4	14.0	7 693	6 749	7 996	12 029	12 227
Marion	385	997	10 360	26.9	10.4	21.6	5.8	8 517	8 049	10 172	11 457	10 371
Martin	914	2 367	4 684	5.1	2.0	-1.9	-5.8	4 774	5 068	5 541	5 556	5 785
Mason	934	2 418	3 683	3.9	1.5	9.7	-11.2	3 356	3 780	4 945	5 378	5 511
Matagorda	1 127	2 919	37 828	33.6	13.0	35.5	8.4	27 913	25 744	21 559	20 066	17 678
Maverick	1 287	3 333	31 398	24.4	9.4	73.5	24.7	18 093	14 508	12 292	10 071	6 120
Medina	1 331	3 448	23 164	17.4	6.7	14.4	7.1	20 249	18 904	17 013	16 106	13 989
Menard	902	2 337	2 346	2.6	1.0	-11.3	-10.7	2 646	2 964	4 175	4 521	4 447
Midland	902	2 335	82 636	91.6	35.4	26.3	-3.4	65 433	67 717	25 785	11 721	8 005
Milam	1 019	2 639	22 732	22.3	8.6	13.5	-10.0	20 028	22 263	23 585	33 120	37 915
Mills	748	1 938	4 477	6.0	2.3	6.3	-5.7	4 212	4 467	5 999	7 951	8 293
Mitchell	912	2 363	9 088	10.0	3.8	0.2	-19.4	9 073	11 255	14 357	12 477	14 183
Montague	928	2 403	17 410	18.8	7.2	13.6	2.9	15 326	14 893	17 070	20 442	19 159
Montgomery	1 047	2 713	128 487	122.7	47.4	159.7	84.4	49 479	26 839	24 504	23 055	14 588
Moore	905	2 343	16 575	18.3	7.1	17.9	-4.8	14 060	14 773	13 349	4 461	1 555
Morris	256	663	14 629	57.1	22.1	18.8	-2.1	12 310	12 576	9 433	9 810	10 028
Motley	959	2 483	1 950	2.0	0.8	-10.5	-24.1	2 178	2 870	3 963	4 994	6 812
Nacogdoches	939	2 433	46 786	49.8	19.2	28.7	29.7	36 362	28 046	30 326	35 392	30 290
Navarro	1 068	2 767	35 323	33.1	12.8	13.4	-9.5	31 150	34 423	39 916	51 308	60 507
Newton	935	2 422	13 254	14.2	5.5	13.7	12.4	11 657	10 372	10 832	13 700	12 524
Nolan	915	2 369	17 359	19.0	7.3	7.0	-14.5	16 220	18 963	19 808	17 309	19 323
Nueces	847	2 195	268 215	316.7	122.2	12.9	7.2	237 544	221 573	165 471	92 661	51 779
Ochiltree	919	2 380	9 588	10.4	4.0	-1.2	3.5	9 704	9 380	6 024	4 213	5 224
Oldham	1 485	3 846	2 283	1.5	0.6	1.1	17.1	2 258	1 928	1 672	1 385	1 404
Orange	362	938	83 838	231.6	89.4	17.8	17.9	71 170	60 357	40 567	17 382	15 149
Palo Pinto	949	2 458	24 062	25.4	9.8	-16.9	41.2	28 962	20 516	17 154	18 456	17 576
Panola	812	2 102	20 724	25.5	9.9	30.4	-5.8	15 894	16 870	19 250	22 513	24 063
Parker	902	2 337	44 609	49.5	19.1	31.6	48.1	33 888	22 880	21 528	20 482	18 759

Table 2. Land Area and Population: 1930 to 1980—Con.

(Counts relate to counties as defined at each census. For meaning of symbols, see introduction.)

Counties	1980 land area: Square miles	1980 land area: Square kilometers	Population 1980: Number	1980: Per square mile	1980: Per square kilometer	Percent change: 1970 to 1980	Percent change: 1960 to 1970	1970	1960	1950	1940	1930
[illegible]mer	885	2 291	11 038	12.5	4.8	5.0	9.7	10 509	9 583	5 787	5 890	5 869
[illegible]ros	4 776	12 371	14 618	3.1	1.2	6.3	15.0	13 748	11 957	9 939	8 185	7 812
[illegible]k	1 061	2 749	24 407	23.0	8.9	68.8	4.3	14 457	13 861	16 194	20 635	17 555
[illegible]mer	902	2 336	98 637	109.4	42.2	9.0	-21.7	90 511	115 580	73 366	54 265	46 080
esidio	3 857	9 990	5 188	1.3	0.5	7.1	-11.3	4 842	5 460	7 354	10 925	10 154
ins	243	629	4 839	19.9	7.7	29.0	25.4	3 752	2 993	4 266	7 334	7 114
nadal	917	2 376	75 062	81.9	31.6	39.3	58.9	53 885	33 913	13 774	7 185	7 071
eagan	1 173	3 039	4 135	3.5	1.4	27.7	-14.4	3 239	3 782	3 127	1 997	3 028
ed	697	1 806	2 469	3.5	1.4	22.7	-3.2	2 013	2 079	2 479	2 420	2 197
ed River	1 054	2 729	16 101	15.3	5.9	12.6	-8.8	14 298	15 682	21 851	29 769	30 923
eeves	2 626	6 802	15 801	6.0	2.3	-4.4	-6.3	16 526	17 644	11 745	8 006	6 407
eugio	771	1 997	9 289	12.0	4.7	-2.2	-13.5	9 494	10 975	10 113	10 383	7 691
oberts	915	2 369	1 187	1.3	0.5	22.8	-10.0	967	1 075	1 031	1 289	1 457
oberts[illegible]	864	2 237	14 653	17.0	6.6	1.8	-10.9	14 389	16 157	19 908	25 710	27 240
ockwall	128	332	14 528	113.5	43.8	106.2	19.9	7 046	5 878	6 156	7 051	7 658
unnels	1 056	2 734	11 872	11.2	4.3	-1.9	-19.4	12 108	15 016	16 771	18 903	21 821
usk	932	2 415	41 382	44.4	17.1	21.3	-6.4	34 102	36 421	42 348	51 023	32 484
abine	486	1 258	8 702	17.9	6.9	21.1	-1.6	7 187	7 302	8 568	10 896	11 998
an Augustine	524	1 357	8 785	16.8	6.5	11.8	1.8	7 858	7 722	8 837	12 471	12 471
an Jacinto	572	1 482	11 434	20.0	7.7	70.6	8.9	6 702	6 153	7 172	9 056	9 711
an Patricio	693	1 795	58 013	83.7	32.3	22.7	5.0	47 288	45 021	35 842	28 871	23 836
an Saba	1 136	2 943	6 204	5.5	2.1	12.0	-13.2	5 540	6 381	8 666	11 012	10 273
chleicher	1 309	3 391	2 820	2.2	0.8	23.8	-18.4	2 277	2 791	2 852	3 083	3 166
curry	900	2 332	18 192	20.2	7.8	15.4	-22.6	15 760	20 369	22 779	11 545	12 188
ackerford	915	2 369	3 915	4.3	1.7	17.8	-16.7	3 323	3 990	5 001	6 211	6 695
elby	791	2 048	23 084	29.2	11.3	17.3	-3.9	19 672	20 479	23 479	29 235	28 627
erman	923	2 390	3 174	3.4	1.3	-13.2	40.4	3 657	2 605	2 443	2 026	2 314
mith	932	2 415	128 366	137.7	53.2	32.2	12.4	97 096	86 350	74 701	69 090	53 123
merveil	188	488	4 154	22.1	8.5	48.7	8.4	2 793	2 577	2 542	3 071	3 016
tar	1 226	3 175	27 266	22.2	8.6	54.0	3.3	17 707	17 137	13 948	13 312	11 409
tephens	894	2 315	9 926	11.1	4.3	18.0	-5.3	8 414	8 885	10 597	12 356	16 560
terling	923	2 390	1 206	1.3	0.5	14.2	-10.3	1 056	1 177	1 282	1 404	1 431
tonewall	925	2 396	2 406	2.6	1.0	0.4	-20.6	2 397	3 017	3 679	5 589	5 667
utton	1 455	3 768	5 130	3.5	1.4	61.6	-15.1	3 175	3 738	3 746	3 977	2 807
wisher	902	2 336	9 723	10.8	4.2	-6.3	-2.2	10 373	10 607	8 249	6 528	7 343
arrant	868	2 248	860 880	991.8	383.0	20.3	32.9	715 587	538 495	361 253	225 521	197 553
aylor	917	2 375	110 932	121.0	46.7	13.4	-3.2	97 853	101 078	63 370	44 147	41 023
errell	2 357	6 105	1 595	0.7	0.3	-17.8	-25.4	1 940	2 600	3 189	2 952	2 660
erry	886	2 296	14 581	16.5	6.4	3.3	-13.3	14 118	16 286	13 107	11 160	8 889
hrockmorton	912	2 363	2 053	2.3	0.9	-6.9	-20.3	2 205	2 767	3 618	4 275	5 253
itus	412	1 068	21 442	52.0	20.1	28.4	-0.5	16 702	16 785	17 302	19 228	16 003
om Green	1 515	3 923	84 784	56.0	21.6	19.3	9.9	71 047	64 630	58 929	39 302	36 033
ravis	989	2 562	419 573	424.2	163.8	42.0	39.3	295 516	212 136	160 980	111 053	77 977
rinity	692	1 791	9 450	13.7	5.3	23.9	1.2	7 628	7 539	10 040	13 705	13 637
yler	922	2 389	16 223	17.6	6.8	30.7	16.4	12 417	10 666	11 292	11 948	11 448
pshur	587	1 521	28 595	48.7	18.8	36.3	6.0	20 976	19 793	20 822	26 178	22 297
pton	1 243	3 220	4 619	3.7	1.4	-1.7	-24.7	4 697	6 239	5 307	4 297	5 968
valde	1 564	4 052	22 441	14.3	5.5	29.4	3.2	17 348	16 814	16 015	13 246	12 945
al Verde	3 150	8 158	35 910	11.4	4.4	30.7	12.3	27 471	24 461	16 635	15 453	14 924
an Zandt	855	2 214	31 426	36.8	14.2	41.8	16.0	22 155	19 091	22 593	31 155	32 315
ictoria	887	2 297	68 807	77.6	30.0	28.0	15.7	53 766	46 475	31 241	23 741	20 048
alker	786	2 036	41 789	53.2	20.5	51.0	28.9	27 680	21 475	20 163	19 868	18 528
aller	514	1 331	19 798	38.5	14.9	38.6	18.3	14 285	12 071	11 961	10 280	10 014
ard	836	2 164	13 976	16.7	6.5	7.4	-12.7	13 019	14 917	13 346	9 575	4 599
ashington	610	1 580	21 998	36.1	13.9	16.7	-1.6	18 842	19 145	20 542	25 387	25 394
ebb	3 363	8 709	99 258	29.5	11.4	36.2	12.5	72 859	64 791	56 141	45 916	42 128
harton	1 086	2 814	40 242	37.1	14.3	9.6	-3.7	36 729	38 152	36 077	36 158	29 681
heeler	905	2 343	7 137	7.9	3.0	10.9	-19.0	6 434	7 947	10 317	12 411	15 555
ichita	606	1 570	121 082	199.8	77.1	0.4	-2.4	120 563	123 528	98 493	73 604	74 416
ilbarger	947	2 453	15 931	16.8	6.5	3.8	-13.5	15 355	17 748	20 552	20 474	24 579
illacy	589	1 526	17 495	29.7	11.5	12.4	-22.5	15 570	20 084	20 920	13 230	10 499
illiamson	1 137	2 944	76 521	67.3	26.0	105.1	6.5	37 305	35 044	38 853	41 698	44 146
ilson	807	2 089	16 756	20.8	8.0	28.5	-1.7	13 041	13 267	14 672	17 066	17 606
inkler	840	2 175	9 944	11.8	4.6	3.2	-29.4	9 640	13 652	10 064	6 141	6 784
ise	902	2 337	26 575	29.5	11.4	35.0	15.7	19 687	17 012	16 141	19 074	19 178
ood	689	1 784	24 697	35.8	13.8	32.9	5.3	18 589	17 653	21 308	24 360	24 183
akum	800	2 072	8 299	10.4	4.0	13.0	-8.6	7 344	8 032	4 339	5 354	1 263
oung	919	2 380	19 083	20.8	8.0	23.9	-10.7	15 400	17 254	16 810	19 004	20 128
apata	999	2 587	6 628	6.6	2.6	52.3	-0.9	4 352	4 393	4 405	3 916	2 867
avala	1 298	3 363	11 666	9.0	3.5	2.6	-10.4	11 370	12 696	11 201	11 603	10 349

		DOT
Liberty	50%	23544
Montgomery	80%	102790
Waller	80%	15838
Fort Bend	60%	78507
Brazoria	50%	84793
Galveston	80%	156752
Chambers	30%	5561
Austin	20%	3545
Harris	100%	2409547
		2,880,877

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VI
ALLIED BANK TOWER AT FOUNTAIN PLACE
1445 ROSS AVENUE
DALLAS, TEXAS 75202

DATE: 1/11/89
SUBJECT: FIT TASK REQUEST
FROM: DeCarlo Ciccel (6W-MA)
TO: DAVE WINEMAN (6E-SH)

Please task FIT to complete the following work:

☒ New Assignment
☐ Amendment

Key EPA Contact:
Name: DeCarlo Phone: 655 6740

SSID Number: L9K1

CERID Number: TXD006806582

EPA Site Name: Palmer Pack Warehouse

City/County/State: Houston/Harris/TX

Desired Report Format:
☒ Formal Report ☐ Standard Report ☐ Other (Specify):
☐ Letter Report ☐ Formal Briefing

Type of Activity:
☒ PA ☐ HRS Support ☐ Enforcement Support ☐ General Technical Assistance
☐ SI ☐ Special Studies
☐ ESI

General Task Description: Conduct PA

Specific Elements:

☐ Additional Scope Attached

CONCURRENCE: Brian Burgess
Brian Burgess, Acting Chief

DWW
Debbie Vaughn-Wright

1/11/89

REQUEST FOR SITE IDENTIFIER APPROVAL

REQUESTED BY: Hammack SECTION: 6E-RT DATE: 5/9/88

SITE NAME: PALMER PACK WAREHOUSE SITE NUMBER ASSIGNED K1

Houston TXD006806582

CRITERIA FOR SITE ASSIGNMENT: ENFORCEMENT ON ALL

(1) REMOVAL

- [x] REMOVAL ACTION PROBABLE
- [ ] ACTION MEMO ISSUED
- [ ] ENFORCEMENT ACTIVITY - COST RECOVERY CASE IS LIKELY
- [ ] EMERGENCY NUMBER ASSIGNED BY OSC

REMEDIAL

- [ ] RI/FS - REMEDIAL INVESTIGATION/FEASIBILITY STUDY (Normally only approved NPL sites)
- [ ] IRM - INITIAL REMEDIAL MEASURE
- [ ] FORWARD PLANNING (Can Occur Prior To NPL)

CIRCLE APPLICABLE PROGRAM(s): REMOVAL - REMEDIAL - REMOVAL/REMEDIAL - ENFORCEMENT

THE FOLLOWING ACCOUNT NUMBERS WILL BE ESTABLISHED BY THE FINANCIAL MANAGEMENT SECTION (6M-RF) IF THE PROGRAM IS CIRCLED ABOVE:

REMOVAL/REMEDIAL
(all accounts listed below)

	REMOVAL	REMEDIAL	ENFORCEMENT
ESD	TFA06M8 __ TGB06M5 __ TGB06MP __	TFA06M9 __ TGB06M6 __	TFA06M7 __ TGB06M4 __
HAZARDOUS WASTE	TGB06L5 __ TFA06L8 __	TGB06L6 __ TFA06L9 __ TGB06LP __	TGB06L4 __ TGB06LP __
ORC	TJB06D5 __ TEY06D5 __	TJB06D6 __ TEY06D6 __	TJB06D4 __ TEY06D4 __
MGMT	TEN06C8 __	TEN06C9 __	TEN06C7 __

WHEN REMOVAL/REMEDIAL THE FOLLOWING WILL ALSO BE ADDED:

TGB06L4__ / TJB06D4__ / TEY06D4__ / TEN06C7__ / TFA06M7 __ /TGB06M4 __

FOR ALL SITES ADD: TFA06MU__ / TGB06MU__

THIS REQUEST OF A SITE IDENTIFIER HAS [x] HAS NOT [ ] BEEN APPROVED.

APPROVED BY: _____
SUPERFUND BRANCH CHIEF OR DESIGNEE

UPDATED FY 87