

AG.

File

4.10.84

80 Lister Ave.

2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (TCDD)
DATA IN CONJUNCTION WITH AVAILABLE CDC
GUIDANCE DOCUMENTS

PROJECT FOR
PERFORMANCE OF
REMEDIAL RESPONSE ACTIVITIES AT
UNCONTROLLED HAZARDOUS
SUBSTANCE FACILITIES—ZONE 1

NUS CORPORATION
SUPERFUND DIVISION

R-584-1-84-4

EVALUATION OF THE 80 LISTER AVENUE
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (TCDD)
DATA IN CONJUNCTION WITH AVAILABLE CDC
GUIDANCE DOCUMENTS

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO. 02-8305-19ZZ

CONTRACT NO. 68-01-6699

FOR THE

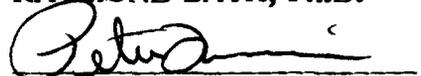
ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

APRIL 10, 1984

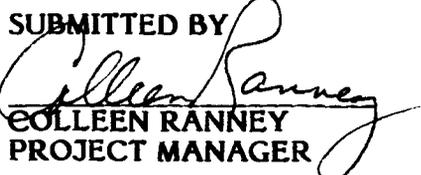
NUS CORPORATION
SUPERFUND DIVISION

REVIEWED/APPROVED BY


RAYMOND BATH, Ph.D.


PETER FRANCONERI P.E.
REGIONAL PROJECT MANGER

SUBMITTED BY


COLLEEN RANNEY
PROJECT MANAGER

CONTENTS

	PAGE
1.0 EXECUTIVE SUMMARY	1
1.1 Residential Zones	1
1.2 Commercial Zones	3
2.0 OBJECTIVE	4
3.0 BACKGROUND	5
3.1 Study Area	5
3.2 Site History	5
3.3 Investigative History	9
3.4 Remedial Action	10
3.5 CDC Documents	13
4.0 METHODOLOGY	14
4.1 Study Area Definition	14
4.2 Area Zoning	14
4.3 Data Evaluation	15
4.4 Risk Management	17
5.0 FINDINGS	19
5.1 Residential Zone 1	19
5.2 Residential Zone 2	19
5.3 Residential Zone 3	23
5.4 Residential Zone 4	23
5.5 Commercial Zone 5	26
5.6 Commercial Zone 2	26
5.7 Commercial Zone 3	29
5.8 Commercial Zone 4	31
6.0 CONCLUSIONS	33
6.1 Residential Zones	33
6.2 Commercial Zones	36
7.0 REFERENCES	41
8.0 TABLES	42
9.0 APPENDIX A	A-1
Bias Assessment for the Newark Dioxin Monitoring Program	

FIGURES

<u>Number</u>		<u>Page</u>
1-1	Residential Zones, Commercial Zones and Areas of Concern	2
3-1	Study Area Location Map	6
3-2	Site Vicinity Map - 80 Lister Ave.	7
3-3	Brady Iron & Metals Vicinity Map	8
3-4	Study Area Remediation Map	11
5-1	Study Area Residential and Commercial Zones	20
5-2	Residential Zone 1	21
5-3	Residential Zone 2	22
5-4	Residential Zone 3	24
5-5	Residential Zone 4	25
5-6	Commercial Zone 1	27
5-7	Commercial Zone 2	28
5-8	Commercial Zone 3	30
5-9	Commercial Zone 4	32
6-1	Residential Zone 1 Areas of Concern	35
6-2	Commercial Zone 2 Areas of Concern	38
8-1	Transportation Route Sampling Key	104

TABLES

<u>Number</u>		<u>Page</u>
3-1	Summary of Sampling Phases	42
5-1	Residential Zone 1	44
5-2	Residential Zone 2	49
5-3	Residential Zone 3	51
5-4	Residential Zone 4	54
5-5	Commercial Zone 1	55
5-6	Commercial Zone 2	60
5-7	Commercial Zone 3	69
5-8	Commercial Zone 4	75
6-1	Residential Zone 1 Soil Samples Above 0.78 ppb	97
6-2	Residential Zone 3 Soil Samples Above 0.78 ppb	98
6-3	Commercial Zone 1 Soil Samples Above 5 ppb	99
6-4	Commercial Zone 2 Soil Samples Above 5 ppb	100
6-5	Commercial Zone 3 Soil Samples Above 5 ppb	103

1.0 EXECUTIVE SUMMARY

The analytical data from samples taken in the vicinity of 80 Lister Avenue have been evaluated in conjunction with the CDC document entitled, "Health Implications of 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) Contamination of Residential Soil" and previous documents relating to soil contamination at various sites in Missouri.

The CDC document states that "residential soil levels greater than 1 ppb TCDD pose a level of concern." It also states that in commercial zones, a "level of concern may not be reached until levels several fold or more above 1 ppb are reached."

Statistical evaluation of the data has set the cutoff point for considering a sample positive at the 1 ppb action level to be 0.78 ppb. Values less than 0.78 ppb have a 95% confidence of being truly less than the 1 ppb action level.

Based upon demographic and photo interpretation, the 80 Lister Avenue study area has been divided into eight (8) sub areas: four (4) Residential Zones and four (4) Commercial Zones. Figure 1-1 provides a map of the study area. The map provides the location of the residential zones, commercial zones, and "areas of concern". In this report "areas of concern" are places where further sampling or remediation is planned.

1.1 RESIDENTIAL ZONES

Residential Zone 1 contains four (4) areas of concern where further sampling or remediation is planned: 1) the area around 68 Joseph Street; 2) the parkways on either side of Albert Avenue between Joseph and Esther Streets; 3) the parkway on Lockwood Street near the corner of Albert Avenue; and 4) the area extending from the yard at #22 Joseph Street to the parkways on both sides of Esther Street.

TCDD values in Residential Zones 2, 3 and 4 are all considered below the recommended CDC action level.

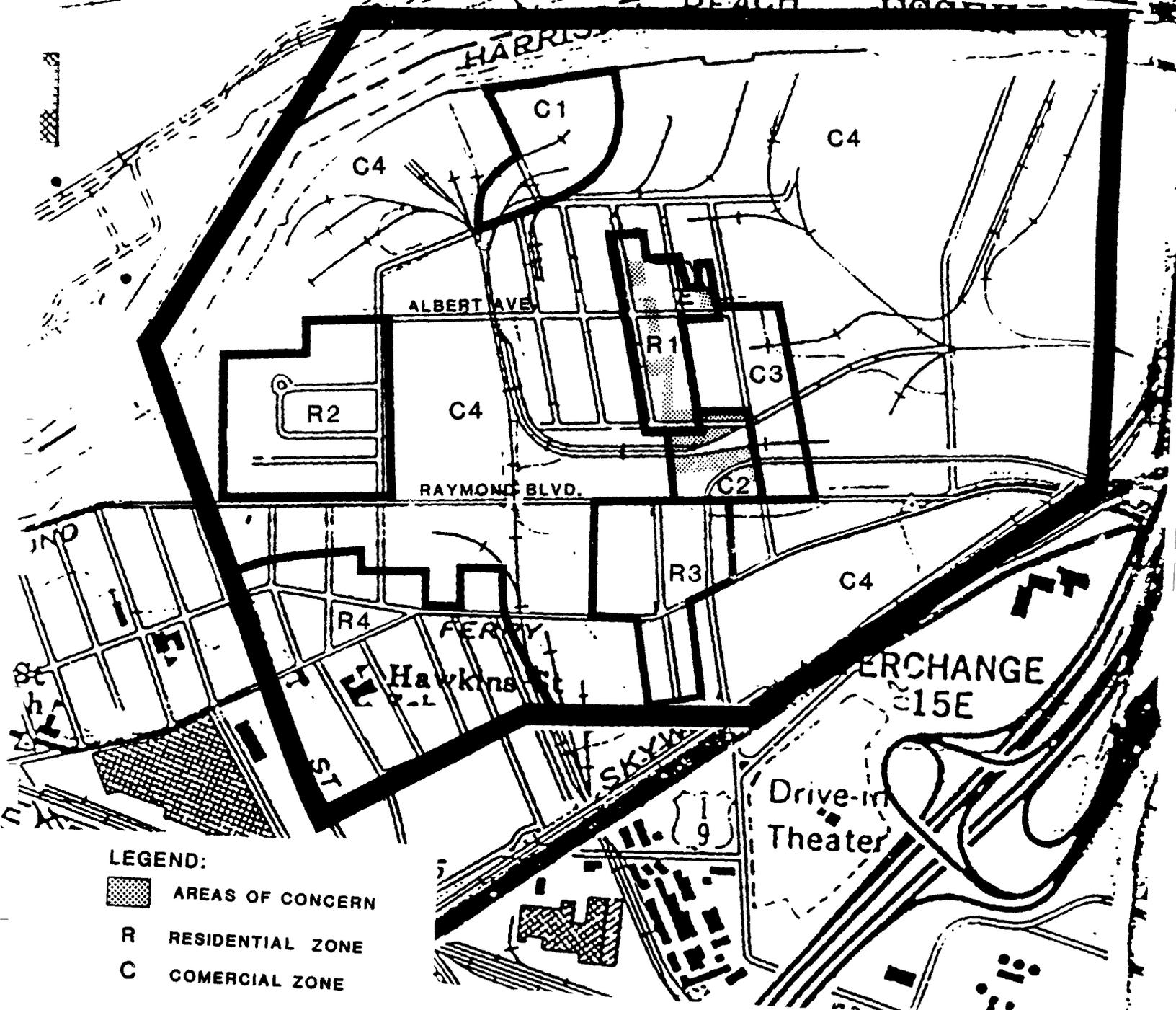


CONRAIL

HUDSON CO

BEACH

HARRIS



LEGEND:

-  AREAS OF CONCERN
- R RESIDENTIAL ZONE
- C COMERCIAL ZONE

**RESIDENTIAL ZONES, COMERCIAL ZONES
AND AREAS OF CONCERN
80 LISTER AVE., NEWARK, N.J.**

(NOT TO SCALE)

FIGURE 1-1



1.2 COMMERCIAL ZONES

Commercial Zone 2 contains four (4) areas of concern. The first two (2) areas are adjacent to and just down gradient from the Brady Iron and Metals property. These areas will be included in the remediation that is planned for the Brady Iron and Metals site.

The two other areas of concern in Commercial Zone 2 are located north of the Brady property on Euclid Avenue and south of the property on the Lockwood Street parkway between Pulaski Skyway Off Ramp and Raymond Boulevard. Further sampling or remediation is required in these two areas.

Commercial Zones 1,3 and 4 are all below the recommended CDC level of concern for commercial areas.

2.0 OBJECTIVE

NUS Corporation, acting as the Field Investigation Team (FIT) to the U.S. EPA Region II, was tasked to interpret the analytical results from the TCDD sampling in the vicinity of 80 Lister Avenue, Newark, NJ in conjunction with the available Centers for Disease Control (CDC) guidance documents and to report on possible future work required in the vicinity of 80 Lister Avenue. This report is authorized under Technical Directive Document (TDD) #02-8305-19ZZ.

3.0 BACKGROUND

3.1 Study Area

Figure 3-1 is a study area location map. The study area is located in the vicinity of 80 Lister Avenue, Newark, New Jersey. It includes the former Diamond Shamrock Company facility on Lister Avenue, the Brady Iron and Metals facility on Lockwood Street, and the heavily industrialized area surrounding these two facilities. There are also a number of residences and a major food distribution center located within this area.

3.2 Site History

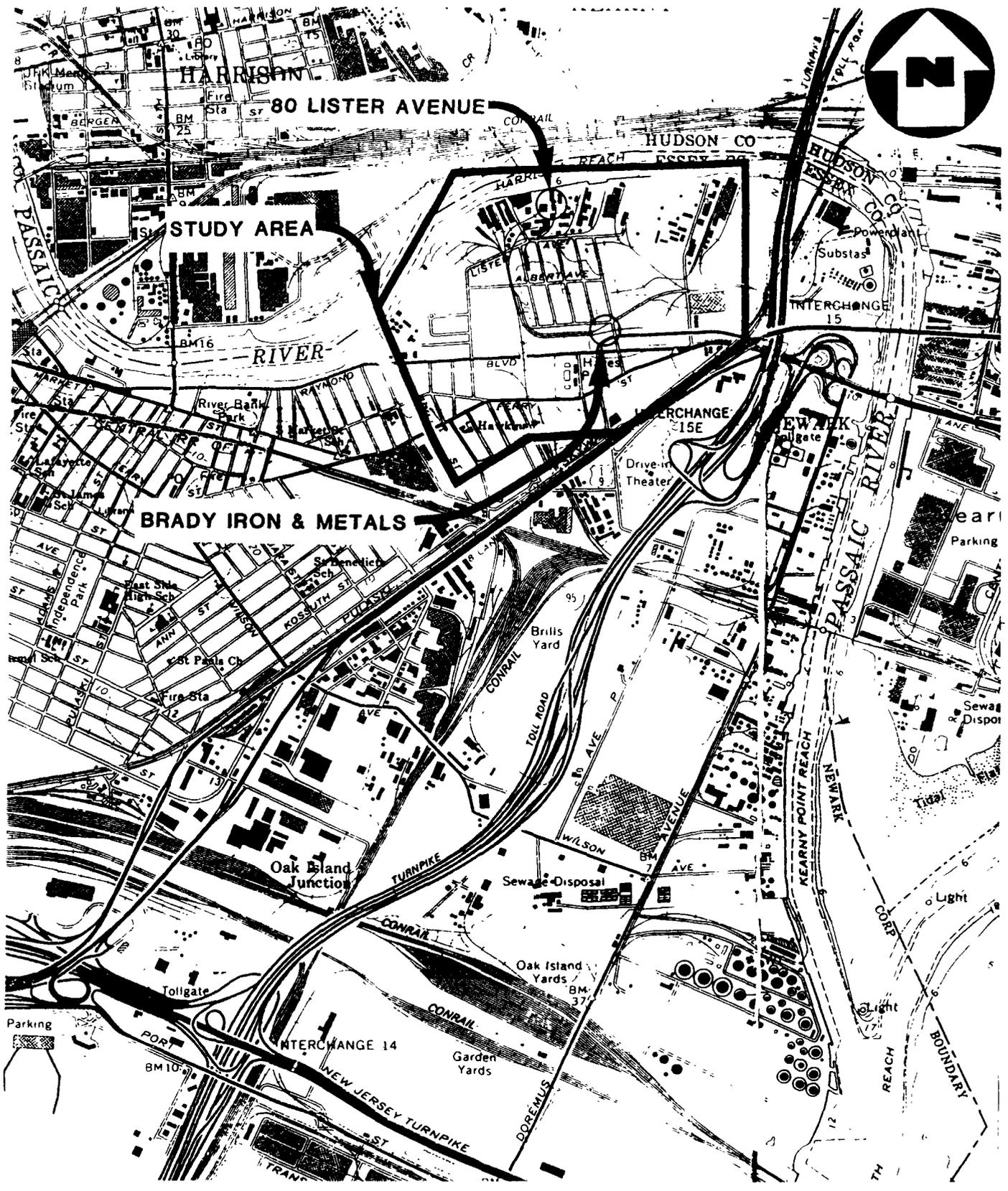
Two locations have been identified with contaminant levels above 100 ppb TCDD, the 80 Lister Avenue property and the Brady Iron and Metals site.

Figure 3-2 provides a site vicinity map of the 80 Lister Avenue property. The property is located in an industrial part of the study area and is bounded on the south by Sherwin-Williams and Duralac, on the west by a large industrial building owned by Sherwin-Williams, on the east by Sergeant Pulp and Chemical, and on the north by the Passaic River.

The facility on 80 Lister Avenue is a former herbicide manufacturing plant which produced 2,4,5 trichlorophenol (TCP) as an intermediate product in the manufacture of 2,4,5 trichlorophenoxy acetic acid (2,4,5 T). The 2,3,7,8-TCDD isomer is known to be a contaminant of 2,4,5-TCP.

Brady Iron and Metals was identified as a secondary source of TCDD contamination through extensive sampling that was conducted in the study area.

Figure 3-3 provides a site vicinity map of the Brady Iron and Metals facility. The facility is located on Lockwood Street between Euclid Avenue and Raymond Boulevard, and is bounded on the south by the Pulaski Skyway Off-Ramp and the Old Morris Canal Bed, on the east by Lockwood Avenue, and on the north and west by a spur of the New Jersey Central Railroad.



STUDY AREA LOCATION MAP
80 LISTER AVENUE, NEWARK, N.J.

SCALE: 1"=2000'

FIGURE 3-1



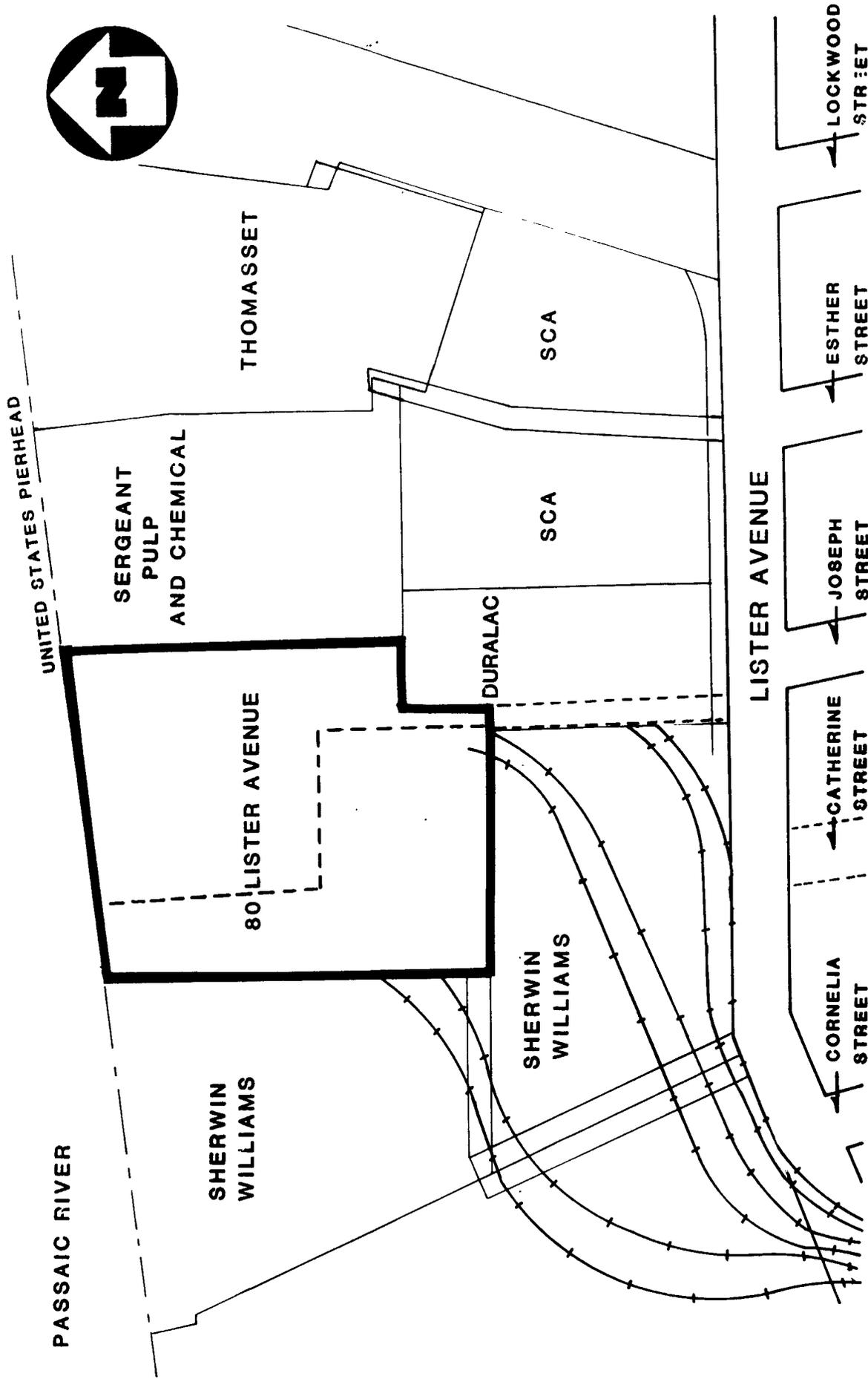
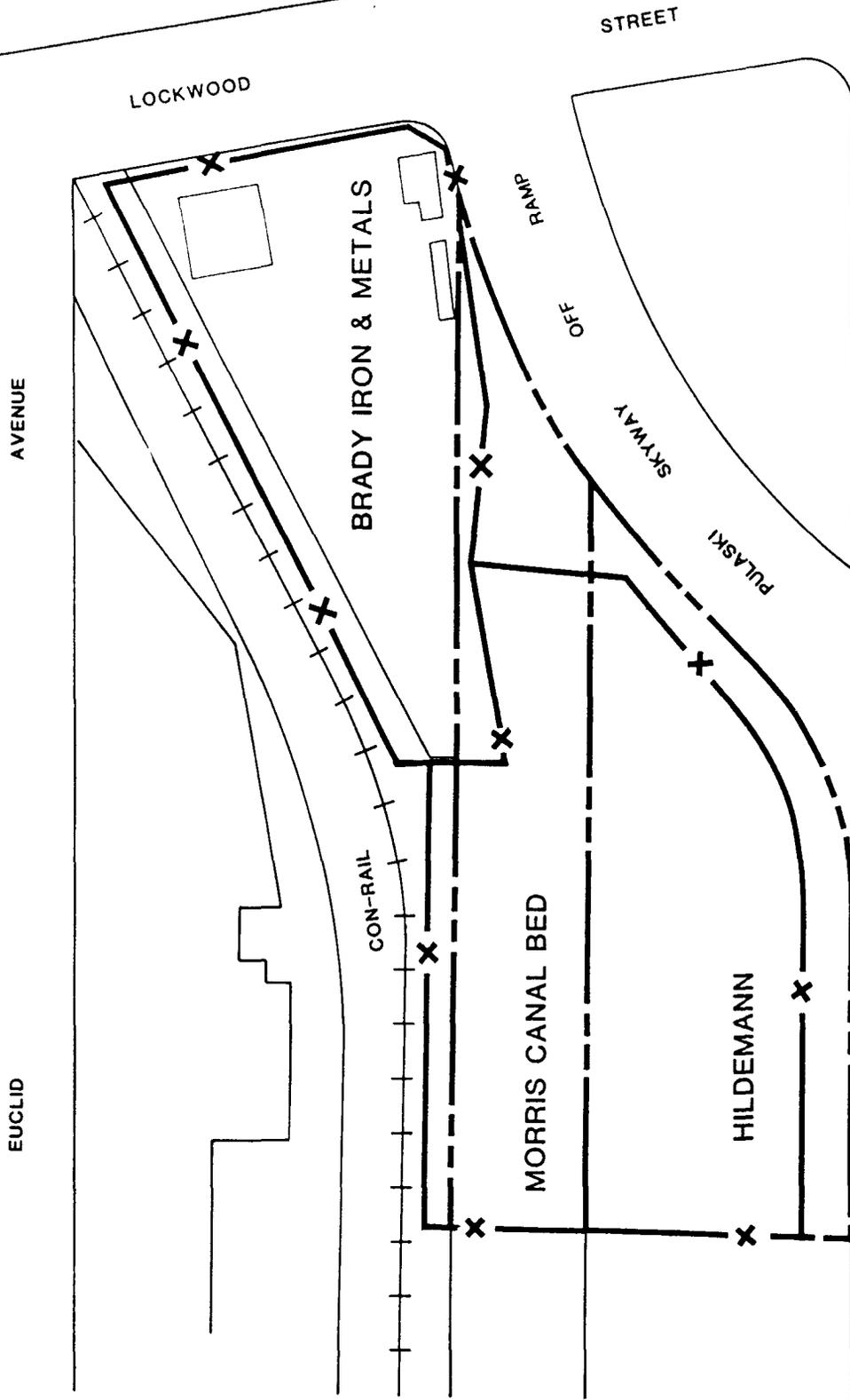


FIGURE 3-2



SITE VICINITY MAP
80 LISTER AVE, NEWARK, N.J.

(NOT TO SCALE)



8

BRADY IRON AND METALS VICINITY MAP
80 LISTER AVE, NEWARK, N.J.

LEGEND:
 -X- FENCE

(NOT TO SCALE)

Brady Iron and Metals is a scrap metal salvage facility which has accepted industrial scrap materials from a variety of chemical and manufacturing industries in the area. Scrap materials which have been hauled to Brady include pipes, storage containers, holding tanks and chemical reaction vessels. It is alleged that some of the old reaction vessels from 80 Lister Avenue were transported to and dismantled at the Brady site.

3.3 Investigative History

In April 1983, the New Jersey Department of Environmental Protection (NJDEP) took two (2) soil samples on the 80 Lister Avenue property. One NJDEP sample contained 1220 ppb of 2,3,7,8-TCDD. Datum from the other sample is not available due to sample matrix problems.

On May 27, 1983, FIT sampled soil at nine (9) on-site locations and verified 2,3,7,8-TCDD contamination. Concentrations ranged from 60 ppb to greater than 50,000 ppb. On June 2, 1983, the NJDEP collected nine (9) off-site soil samples. The results showed that contamination existed off-site. Concentrations ranged from not-detected to 15 ppb.

To determine the habitability of the surrounding area, FIT collected thirty-three (33) samples in the vicinity of the 80 Lister facility from June 3rd to June 8th, 1983. These samples included vacuum bags, air conditioner filters, soil and sweep samples.

FIT initiated a more comprehensive sampling plan on June 11, 1983 to further define the extent of 2,3,7,8-TCDD contamination in the 80 Lister Avenue vicinity. Table 3-1 (p. 42) provides a summary of the twenty-five (25) sampling phases. The sampling dates, types, and numbers of samples are provided for each sampling phase.

3.4 Remedial Action

Remedial actions have been implemented throughout the sampling period in an effort to respond quickly to minimize potential public health exposures.

There are eight (8) locations within the study area where remediation has taken place. Figure 3-4 provides a study area remediation map showing these eight (8) locations.

3.4.1 Remedial Action 1

The 80 Lister Avenue and the neighboring Sergeant Pulp and Chemical properties were covered with a tarp and fenced off to restrict access.

3.4.2 Remedial Action 2

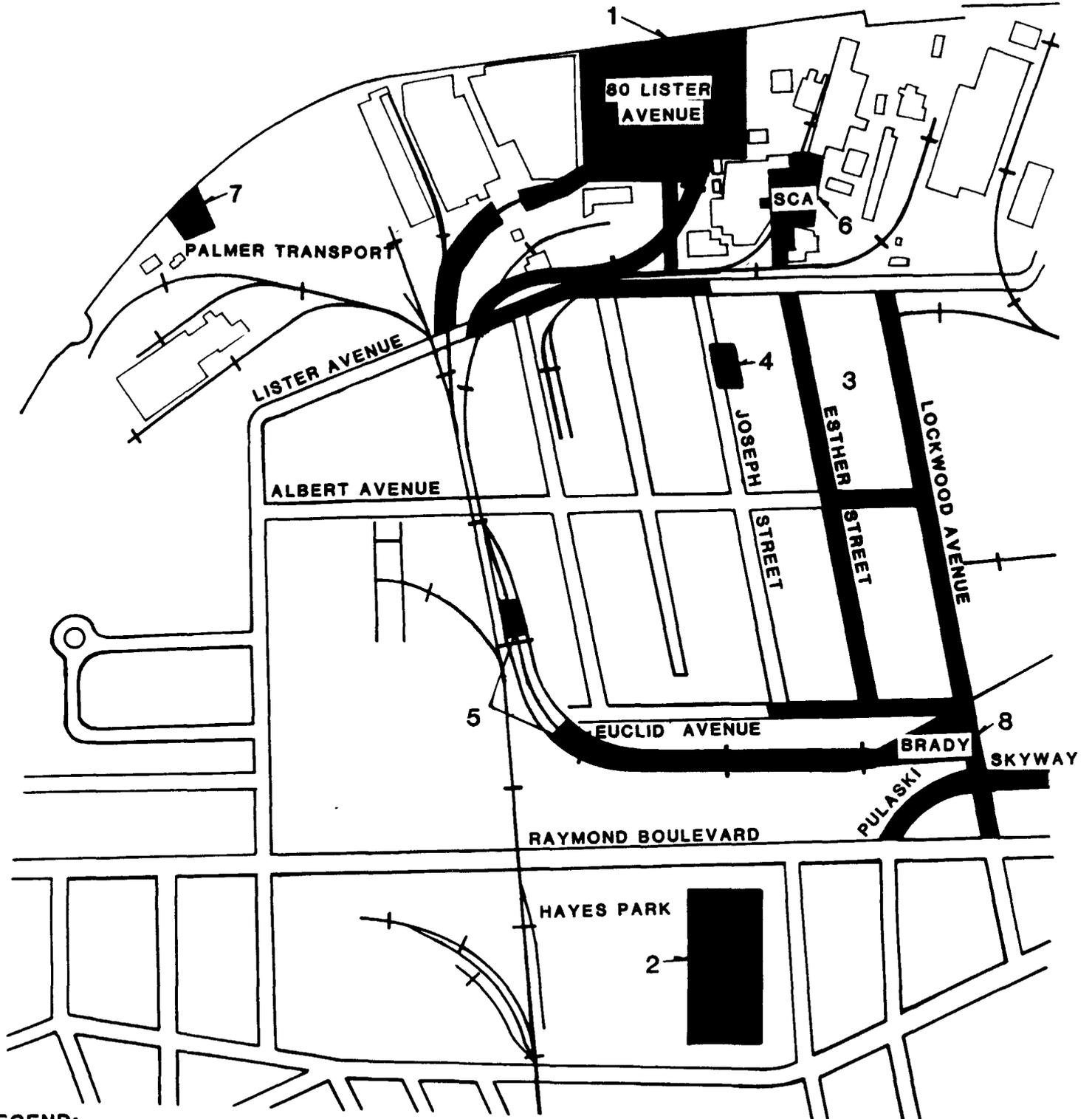
Industrial vacuums were used to clean up the pools and decks at Hayes Park East, a community park and swimming area.

3.4.3 Remedial Action 3

Contaminated streets in the vicinity were vacuumed using a specially designed vacuum truck system. Streets that were vacuumed include: Lockwood and Esther Streets, parts of Joseph Street, Euclid Avenue, Albert Avenue and Lister Avenue, 80 Lister Avenue driveway and the Pulaski Skyway Ramp.

3.4.4 Remedial Action 4

The parkway on both sides of the telephone pole in front of #68 Joseph Street was also remediated. The strip of ground between the sidewalk and curb is referred to as a parkway. For the first 10 feet of parkway north of the pole, soil was removed and replaced with gravel. In the next ten (10) feet of parkway north of the pole, 2½ to 3 inches of soil were removed from around the bricks. On the parkway south of the pole, soil was removed until the paved surface underneath was reached.

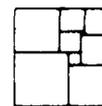


LEGEND:

 REMEDIATED AREA

**STUDY AREA REMEDIATION
80 LISTER AVE., NEWARK, N.J.**

FIGURE 3-4



NUS
CORPORATION



A Halliburton Company

3.4.5 Remedial Action 5

The railroad tracks leaving the 80 Lister Avenue site, including the tracks on Sherwin Williams property, and other contaminated tracks in the study area were tarped and covered with gravel. The tarps were cut along the metal rails to allow industries to continue using the railroad.

3.4.6 Remedial Action 6

The parking lot on the SCA Lister Avenue property was vacuumed.

3.4.7 Remedial Action 7

The heliport at Palmer Transport Corporation was completely covered with asphalt.

3.4.8 Remedial Action 8

The Brady Iron and Metals site has been stabilized. The perimeter fence was enclosed with tarps and a gunnite wall was placed all around the property inside of the fence. A sand filter and collection system was installed to catch runoff from the site. Further remediation is under consideration at this site.

3.5 CDC Documents

The CDC addressed the health risk of TCDD concentrations in soil in the document, "Health Implications of 2,3,7,8-Tetrachlorodibenzodioxin (TCDD) in Residential Soil".⁽¹⁾

In residential areas, using the virtual safe dose (VSD) derived from animal data, and the assumption that continuous lifetime exposure to TCDD in soil is unlikely, CDC concluded that "residential soil levels greater than 1 ppb TCDD pose a level of concern". It is particularly noted that the greatest risk of TCDD absorption is to children in a residential area.

In commercial soil areas, the estimated human exposure to TCDD is low. The areas are not open to children and most of the parking areas are graveled or paved. CDC noted that in commercial areas "a level of concern may not necessarily be reached unless levels are several fold or more above 1 ppb. However, if concentrations are high or if there is a possibility for movement of soil or a dust problem, remedial measures (such as paving of the area) should be considered in any event. If levels are very high, e.g., above 100 ppb, more extensive remedial action may have to be considered."

A second CDC document on the "Interpretation of Environmental Data from Sites Potentially Containing Dioxin" was issued as draft in April 1983.⁽²⁾ The CDC evaluated the Missouri dioxin data collected by Region VII EPA to develop a statistical cutoff level for considering a sample positive. Based upon results and procedures particular to the TCDD sampling and analysis at the Missouri sites, CDC concluded: "the statistical cutoff level for considering a sample as positive was chosen at 0.3 ppb. This level was chosen to yield a false negative rate of 5% or less for a sample truly at 1.0 ppb." This cutoff level was based upon data which had a coefficient of variation (CV) of 40 to 50%.

4.0 METHODOLOGY

The assignment consisted of four (4) major tasks:

- o Study Area Definition
- o Area Zoning
- o Data Evaluation
- o Risk Management

4.1 Study Area Definition

For the purposes of this evaluation, the study area is defined to be that part of the Ironbound section of Newark that is bordered on the north and northwest by the Passaic River, on the east by the New Jersey Turnpike, and on the south by the Pulaski Skyway. The Passaic River and the Pulaski Skyway form natural barriers to use as boundaries of the study area. Sampling conducted just outside the boundary across the river in Harrison all resulted in TCDD levels either not detected or less than 0.78 ppb.

4.2 Area Zoning

The study area was divided into the two relevant CDC zoning classifications, Residential and Commercial, by reviewing aerial photographs and determining the land use in specific homogeneous areas. If any area contained residences, even if mixed with industrial and commercial type buildings, the area was zoned as Residential. The remaining parts of the study area contained both industrial facilities and commercial structures and are considered commercial for the purpose of this review.

4.3 Data Evaluation

In order to evaluate the data from the environmental samples taken in the 80 Lister Avenue vicinity, the procedures proposed in the CDC document entitled, "Interpretation of Environmental Data From Sites Containing Dioxin," were used. This CDC document specifies Quality Assurance requirements necessary to verify the concentrations of 2,3,7,8-TCDD in individual samples. It also proposes a procedure to set a cutoff point for considering a sample at the action level of 1 ppb so that only 5% of the true positive samples at 1.0 ppb would be missed.

4.3.1 Quality Assurance Requirements

To insure against laboratory bias, CDC recommended that more than one laboratory be utilized. The majority of the environmental samples were analyzed by the Environmental Testing and Certification (ETC) laboratories. About 10% of the samples were sent to two other laboratories for analysis: Batelle Analytical and California Analytical Laboratories Incorporated.

Duplicate samples were often sent to different laboratories to verify results. There was frequently more than one value reported for an individual sample and in order to take the most conservative approach, the highest concentration reported for any sample has been used throughout this report.

To evaluate the overall sampling and analytical precision of the dioxin monitoring program for the 80 Lister Avenue site, "native control samples" were given to the laboratories as blind or unknown samples. This material, referred to as "Reference Material A", was obtained from soil samples collected on the 80 Lister Avenue property.

EPA Quality Assurance review of the "Reference Material A" results showed that the values generated after September 15, 1983 by ETC were much higher than values for the material prior to September 15th. Studies undertaken to determine the cause of the higher values concluded that ETC values before September 15th were biased low. The results of these studies are documented in the March 14, 1984 memorandum, "Bias Assessment for the Newark Dioxin Monitoring Program," provided in Appendix A.

All environmental sampling data generated by ETC prior to September 15, 1983 were therefore increased using a bias factor of 1.24. This bias factor was calculated by using the difference between the mean values of Reference Material "A" generated before and after September 15th. Only corrected values are given in the tables in this report.

4.3.2 Statistical Requirements

Before classifying a sample according to the health action criteria of 1.0 ppb TCDD, the CDC document stated that it was necessary to statistically allow for inherent random sampling and analytical variability. In order to assume a single laboratory analysis with a result less than 1 ppb does not have a true value greater than 1 ppb, a 95% confidence level was determined for the data generated in this report.

Ninety-five (95) samples of "Reference Material A" were analyzed by ETC. These samples had an average concentration, after correcting for laboratory bias, of 7.45 ppb with a standard deviation of 1.087 ppb and a coefficient of variation of 14.59%.

"Reference Material A" is a good representation of the analytical and sampling variability of the environmental data from the 80 Lister Avenue study. "Reference Material A" was a native soil sample collected by the FIT from the 80 Lister Avenue property. The sample underwent the same homogenization, decontamination, and analytical method as the environmental samples.

Since the analytical instrumentation is linear over the range from 0.5 ppb to 10 ppb, the coefficient of variation (CV) is constant over that range. At 0.78 ppb the standard deviation will be 0.11 ppb. On a single analysis the 95% confidence interval will be about twice (2x) the standard deviation. The 95% confidence interval around the value 0.78 ppb is 0.22 ppb. Therefore all data less than 0.78 ppb can be considered less than 1 ppb with 95% confidence.

4.4 Risk Management

To guide public health officials in making the proper risk management decisions on habitability or limiting exposure in TCDD contaminated areas, the CDC "health implications" document presented guidelines on how to develop an appropriate "level of concern" for different soil concentrations depending on specific site scenarios (1). The other CDC document specified the method to obtain a 95% confidence interval for the point decided to be the "action level (2)." Applying these documents to the 80 Lister Avenue data, the following guidelines were used to assess the study area:

Residential Zones- Soil concentrations at or above 0.78 ppb TCDD pose a level of concern and remediation or further sampling is required.

Commercial Zones

To evaluate the commercial zones, the following CDC guidance was used: "a level of concern may not necessarily be reached unless levels are several fold or more above 1 ppb. However, if concentrations are high or if there is a possibility for movement of soil or a dust problem, remedial measures (such as paving of the area) should be considered in any event. If levels are very high, eg., above 100 ppb, more extensive remedial action may have to be considered."(2)

The term "several fold or more" was interpreted to mean at least 5 to 7 ppb. In this situation it was more appropriate to specify a range of values that should be examined to determine if a "level of concern" has been reached. Values falling within this range have been evaluated on a sample by sample basis to determine if the situation requires further action.

This interpretation has resulted in the application of the following guidelines for commercial zones:

- (1) Soil concentrations below 5 ppb TCDD, where movements of soil or dust is not a problem, indicate no further action is necessary.
- (2) Soil concentrations between 5 ppb and 7 ppb TCDD, where movement of soil or dust is not a problem, are of concern when geographically grouped samples indicate an area has an average soil TCDD concentration greater than 5 ppb.
- (3) Soil concentration between 7 ppb and 100 ppb TCDD are high and remedial action is indicated.
- (4) Soil concentration above 100 ppb TCDD are very high and extensive remediation is required.

5.0 FINDINGS

Figure 5-1 provides a map of the study area divided into residential and commercial zones. There are four (4) residential zones, R1 - R4, and four (4) commercial zones C₁-C₄.

5.1 Residential Zone 1 (R1)

Residential Zone 1 encompasses the homogeneous section of residences located on Joseph and Esther Streets and on the block of Albert Avenue between these two streets. Remediation took place along Esther and Albert Streets and in front of 68 Joseph Street.

Figure 5-2 provides a map of Residential Zone 1 with sampling locations and results for all environmental samples. In the areas where remediation occurred, only the data after remediation are presented.

Fifty-six (56) soil and sweep samples from Residential Zone 1 after remediation were analyzed and passed EPA QA/QC requirements. Table 5-1 (p.44) provides the TCDD concentrations for these samples.

Seventeen (17) samples were detected at or above 0.78 ppb TCDD. In thirty-nine (39) samples TCDD was either not detected or detected less than 0.78 ppb.

5.2 Residential Zone 2 (R2)

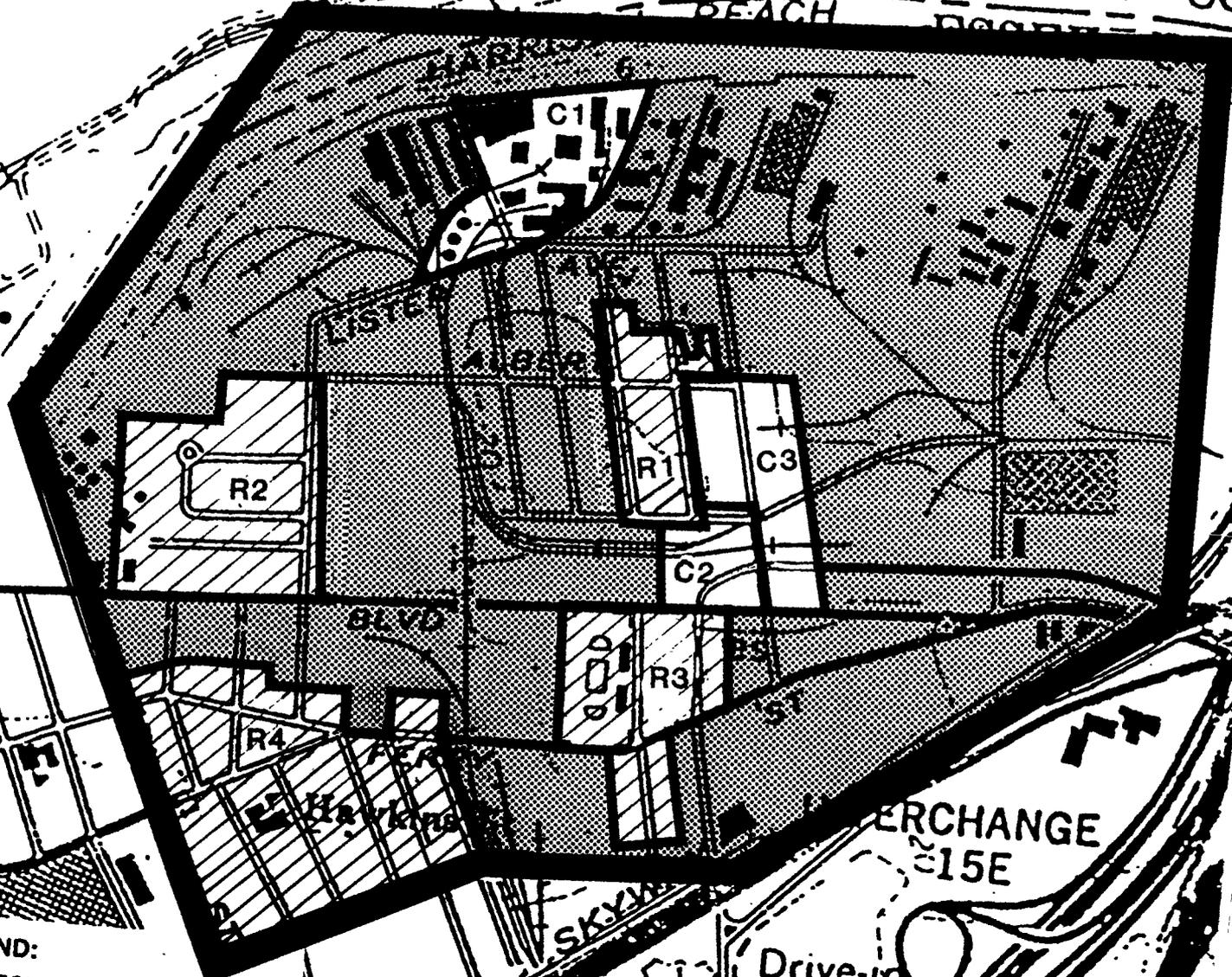
Residential Zone 2 includes all of the Roosevelt Homes Housing Projects and residences along Chapel Street. No remediation took place in this zone.

Figure 5-3 provides a map of Residential Zone 2 with sampling locations and results for all environmental samples.



CONRAIL

HUDSON CO

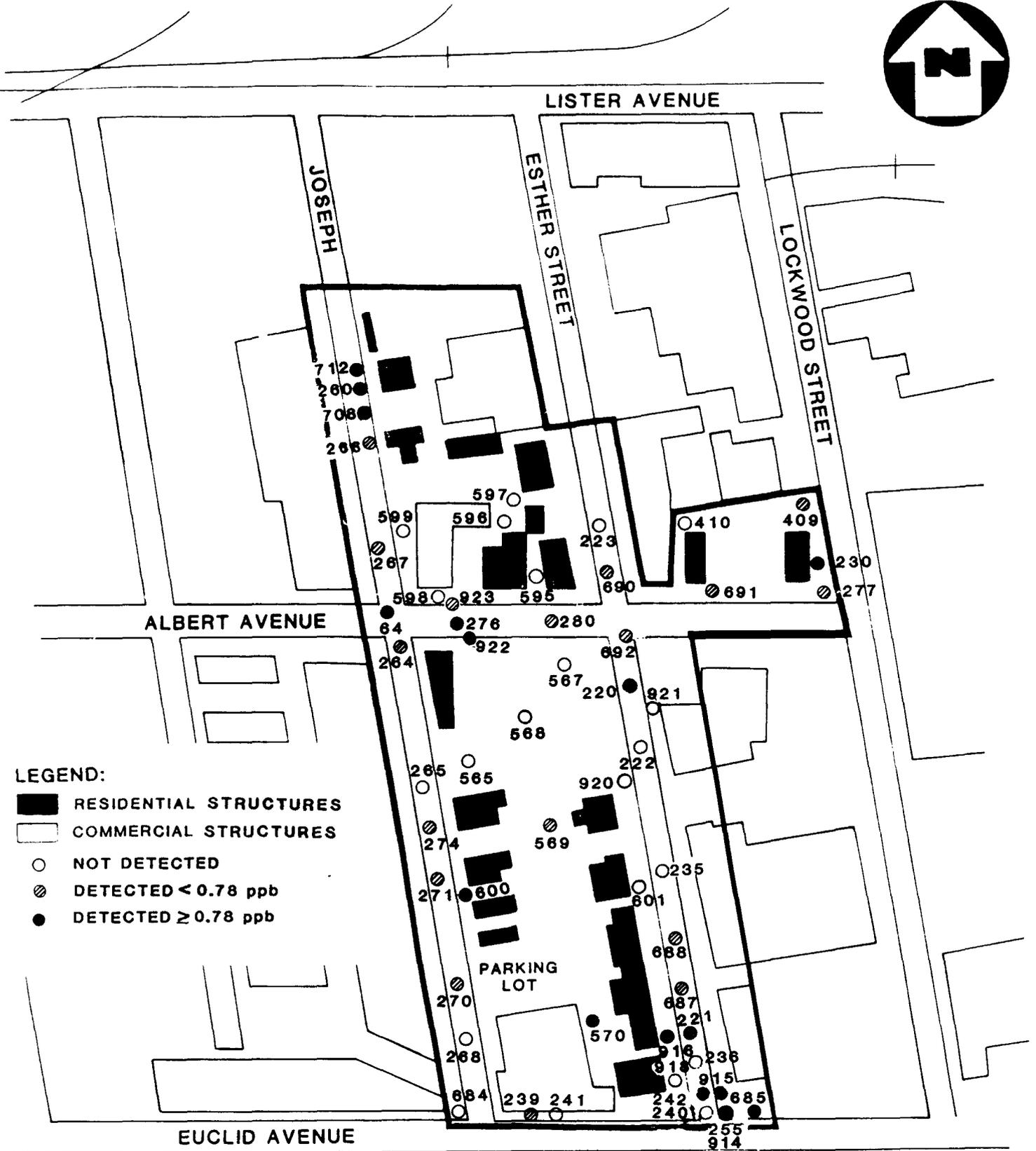


- LEGEND:
-  RESIDENTIAL ZONES
 -  COMMERCIAL ZONES
 -  COMMERCIAL ZONE 4

STUDY AREA RESIDENTIAL & COMMERCIAL ZONES
80 LISTER AVENUE, NEWARK, N.J.
 (NOT TO SCALE)

FIGURE 5-1

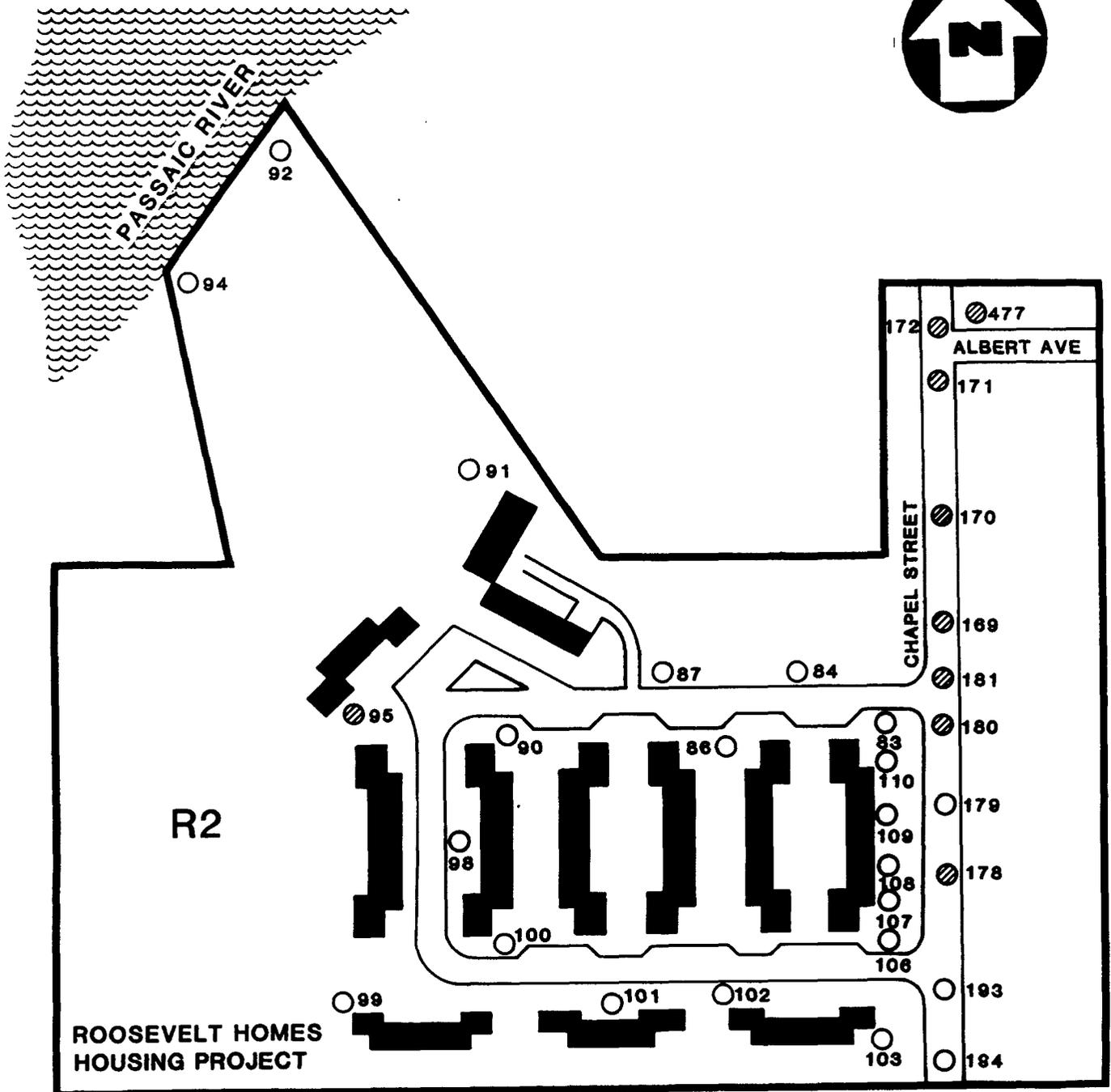




RESIDENTIAL ZONE 1
ENVIRONMENTAL SAMPLES NOT REMEDIATED
80 LISTER AVE., NEWARK, N.J.

FIGURE 5-2





LEGEND:

- NOT DETECTED
- ◐ DETECTED < 0.78 ppb
- DETECTED ≥ 0.78 ppb

**RESIDENTIAL ZONE 2
ALL ENVIRONMENTAL SAMPLES
80 LISTER AVE, NEWARK, N.J.**

(NOT TO SCALE) 22

FIGURE 5-3



A total of thirty-one (31) soil and sweep samples from Residential Zone 2 were analyzed and passed EPA QA/QC requirements. Table 5-2 (p. 49) provides the TCDD concentrations for these samples. All samples were detected less than 0.78 ppb TCDD.

5.3 Residential Zone 3 (R3)

Residential Zone 3 includes Hayes Park East and the residences along Waydell and Foundry Streets. The only remediation that took place in this zone was vacuuming the decks of the pool at Hayes Park East.

Figure 5-4 provides a map of Residential Zone 3 with sampling locations and results for all environmental samples. For the samples taken from the decks at Hayes Park East, only the data after remediation are presented.

Twenty-four (24) soil and sweep samples from Residential Zone 3 after remediation were analyzed and passed EPA QA/QC requirements. Table 5-3 (p. 51) provides the TCDD concentrations for these samples.

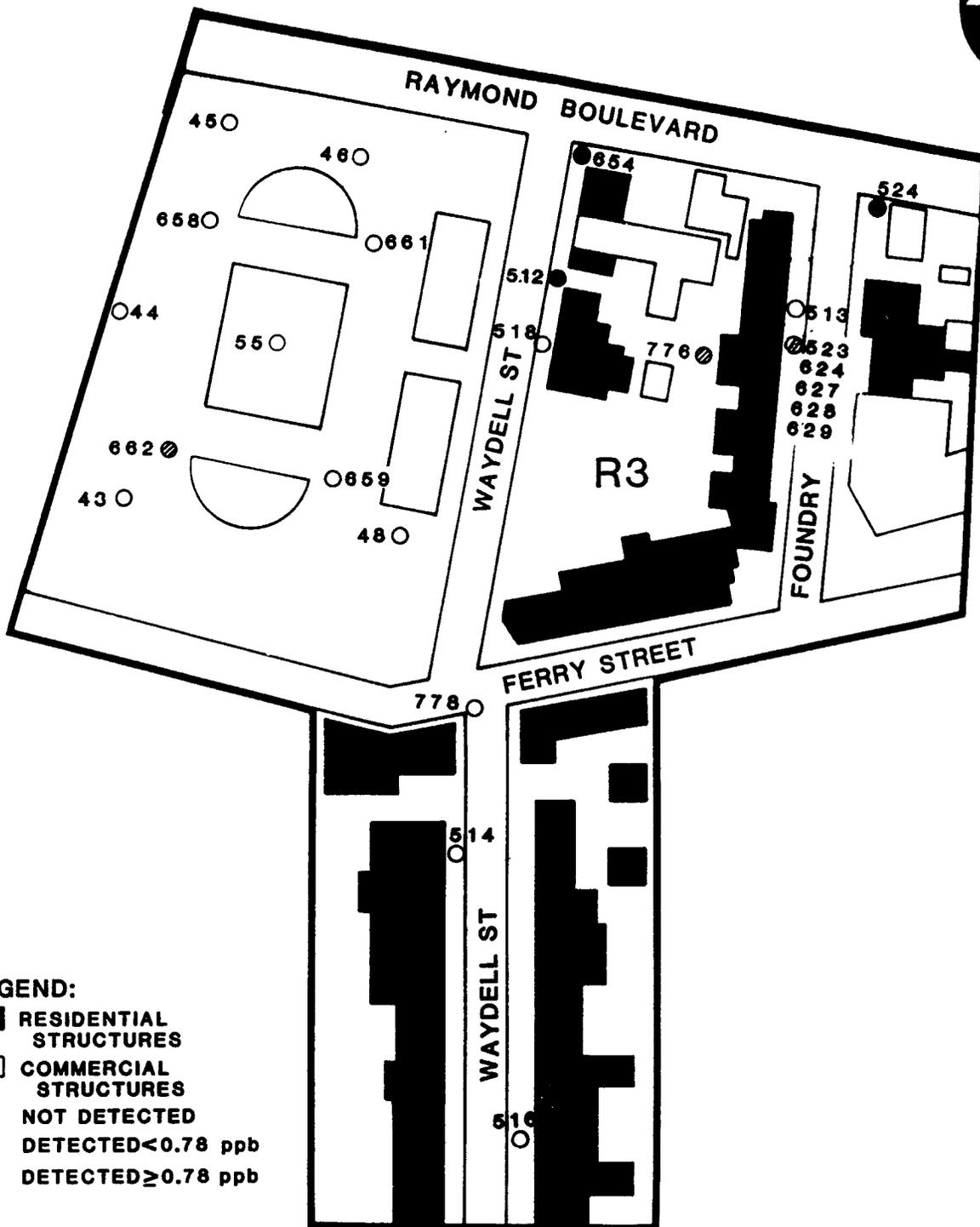
Three (3) samples were detected at or above 0.78 ppb TCDD. In twenty-one (21) samples TCDD was either not detected or detected less than 0.78 ppb.

5.4 Residential Zone 4 (R4)

Residential Zone 4 is that sector of the study area which borders the Hawkins Street School. It includes the residences along parts of Flemming and Lentz Avenues, and along Richards, Schalk, Ferry, Cortland, Hawkins and Horatio Streets. No remediation took place in this zone.

Figure 5-5 provides a map of Residential Zone 4 with sampling locations and results for all environmental samples.

Nine (9) soil and sweep samples from Residential Zone 4 were analyzed and passed EPA QA/QC requirements. Table 5-4 (p. 54) provides the analytical results for the samples. No TCDD was detected in Residential Zone 4.



LEGEND:

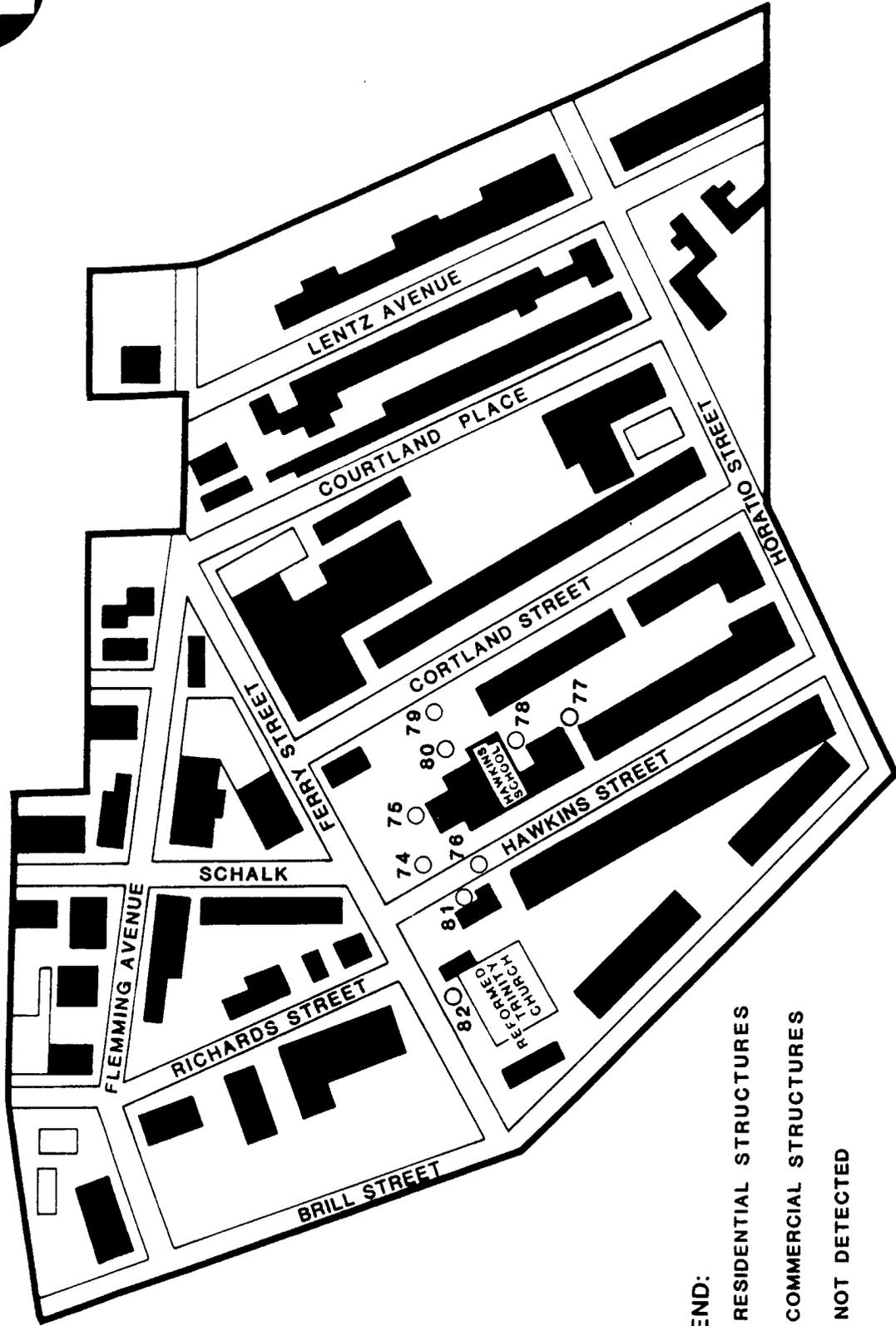
-  RESIDENTIAL STRUCTURES
-  COMMERCIAL STRUCTURES
-  NOT DETECTED
-  DETECTED < 0.78 ppb
-  DETECTED ≥ 0.78 ppb

RESIDENTIAL ZONE 3
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED
80 LISTER AVE., NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-4





LEGEND:

■ RESIDENTIAL STRUCTURES

□ COMMERCIAL STRUCTURES

○ NOT DETECTED

RESIDENTIAL ZONE 4

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

80 LISTER AVE., NEWARK, N.J.

(NOT TO SCALE)

5.5 Commercial Zone 1 (C1)

Commercial Zone 1 is made up of the 80 Lister Avenue site and the properties bordering the site that were also highly contaminated. Included in this zone are the driveway and railroad spurs leaving the site and the part of Lister Avenue that extends from the driveway west to the railroad tracks.

Much of Commercial Zone 1 has been remediated. The 80 Lister Avenue and Sargeant Pulp and Chemical properties have been tarped, as has two of the railroad spurs leaving the site. In addition, the 80 Lister Avenue driveway was vacuumed.

Figure 5-6 provides a map of Commercial Zone 1 with sampling locations and results for all environmental samples that have not been remediated.

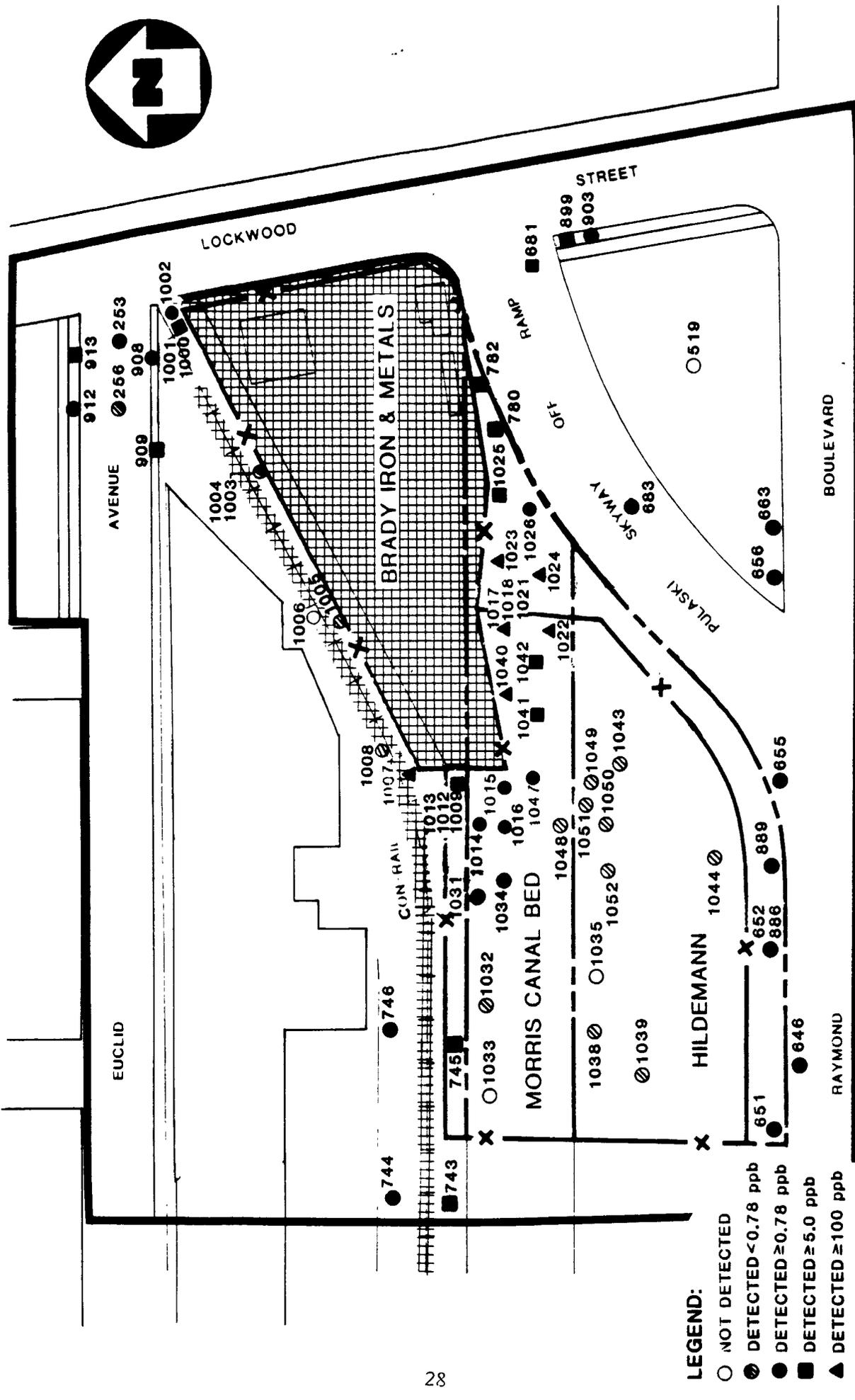
Fifty-one (51) unremediated soil and sweep samples from Commercial Zone 1 were analyzed and passed EPA QA/QC requirements. Table 5-5 (p.55) provides the TCDD concentrations for these samples.

No samples showed TCDD concentrations above 7 ppb. Two (2) samples were detected between 5 ppb and 7 ppb. Twenty (20) samples showed TCDD concentrations between 0.78 ppb and 5 ppb. In twenty-nine (29) samples, TCDD was either not detected or detected below 0.78 ppb.

5.6 Commercial Zone 2 (C2)

Commercial Zone 2 includes the Brady Iron and Metals property and the area immediately surrounding this property. It includes part of the Hildemann property, the old Morris Canal Bed and the Pulaski Skyway ramp parkway, and extends east to Lockwood Street and north to Euclid Avenue. The area inside the Brady property fence has been remediated. The parkway along Lockwood Street and the railroad tracks which border the property to the north have also been remediated.

Figure 5-7 provides a map of Commercial Zone 2 with sampling locations and results for all environmental samples that have not been remediated.



- LEGEND:**
- NOT DETECTED
 - ⊙ DETECTED <0.78 ppb
 - DETECTED ≥0.78 ppb
 - DETECTED ≥5.0 ppb
 - ▲ DETECTED ≥100 ppb
 - ▤ REMEDIATED AREAS
 - x- FENCE

COMMERCIAL ZONE 2
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED
80 LISTER AVE., NEWARK, N.J.
 (NOT TO SCALE)

Sixty-six (66) unremediated soil and sweep samples from Commercial Zone 2 were analyzed and passed EPA QA/QC requirements. Table 5-6 (p. 60) provides the TCDD concentrations for these samples.

Fifteen (15) samples showed TCDD concentrations above 7 ppb including seven (7) samples with TCDD concentrations above 100 ppb. Seven (7) samples were detected between 5 and 7 ppb. Twenty-three (23) samples showed TCDD concentrations between 0.78 ppb and 5 ppb. In twenty-one (21) samples TCDD was not detected or detected below 0.78 ppb.

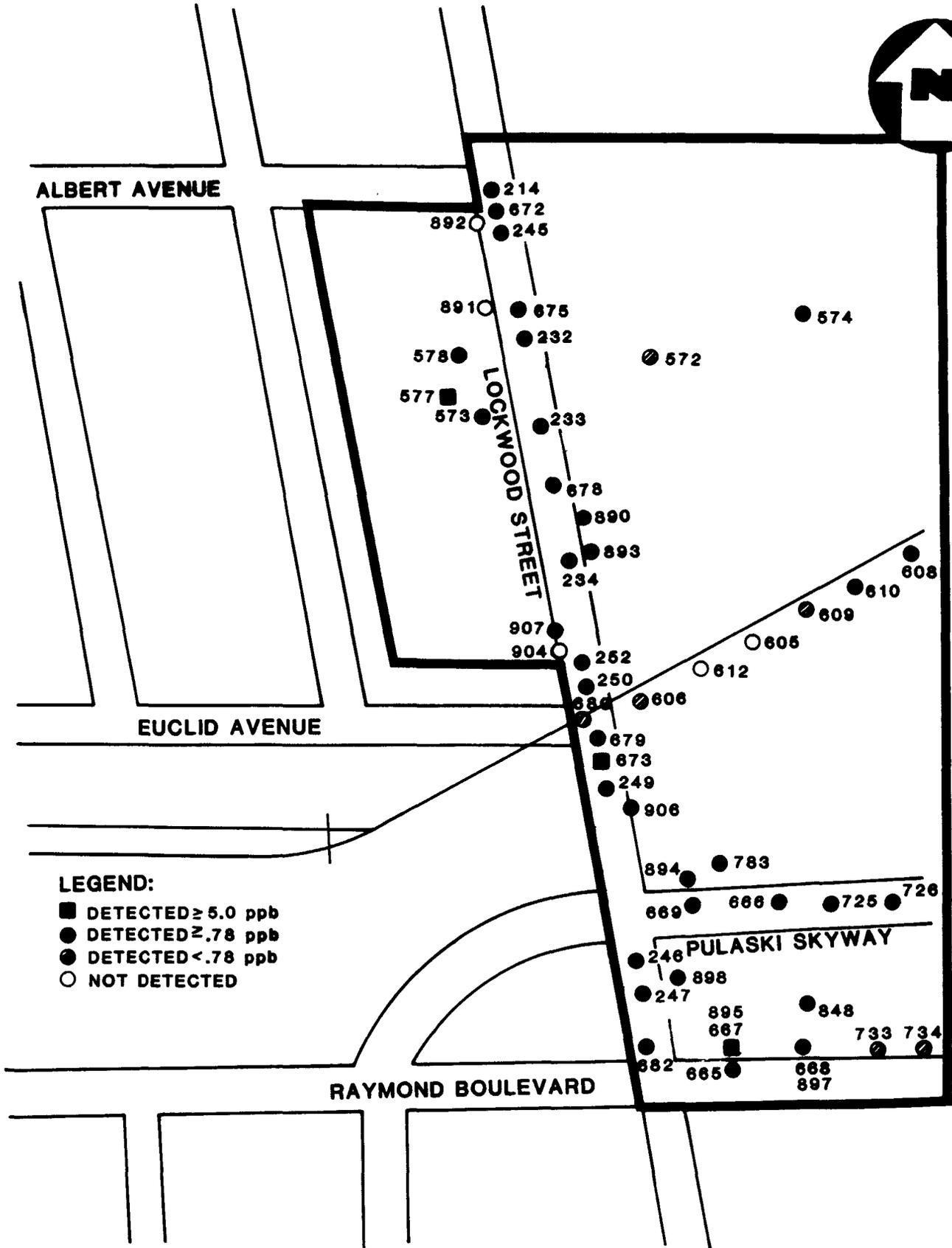
5.7 Commercial Zone 3

Commercial Zone 3 includes the commercial and industrial properties bordering Lockwood Street, extending from Albert Avenue on the north to Raymond Boulevard on the south, and includes part of the Pulaski Skyway off-ramp. The remediation in this zone has consisted of vacuuming Lockwood Street north of Raymond Boulevard, and vacuuming the Pulaski Skyway ramp from Raymond Boulevard to about fifteen (15) feet east of Lockwood Street.

Figure 5-8 provides a map of Commercial Zone 3 with sampling locations and results of all environmental samples. Where remediation occurred, only samples taken after remediation are presented.

Fifty (50) soil and sweep samples from Commercial Zone 3 after remediation were analyzed and passed EPA QA/QC requirements. Table 5-7 (p. 69) provides the TCDD concentrations for these samples.

No samples showed TCDD concentrations above 7 ppb. Three (3) samples were detected between 5 and 7 ppb. Thirty-five (35) samples showed TCDD concentrations between 0.78 ppb and 5 ppb. In twelve (12) samples TCDD was either not detected or was detected less than 5 ppb.



COMMERCIAL ZONE 3
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED
80 LISTER AVE., NEWARK, N.J.
 (NOT TO SCALE)

FIGURE 5-8

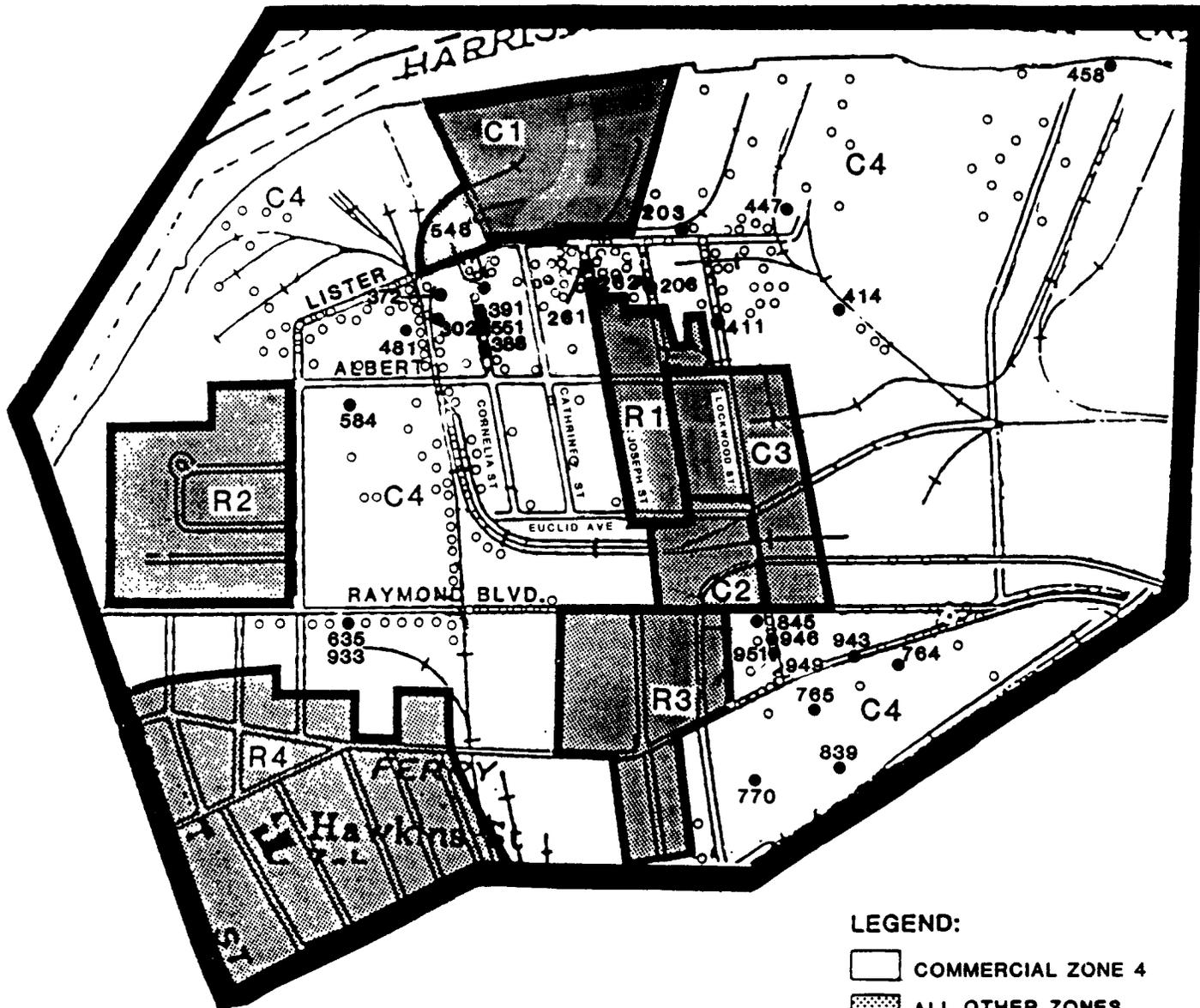


5.8 Commercial Zone 4

Commercial Zone 4 includes the remaining commercial and industrial areas in the study area. Remediation has occurred on the railroad tracks, where initial sampling showed some contamination to be above 1 ppb, and on the heliport of Palmer Transport Corporation.

Figure 5-9 provides a map of Commercial Zone 4 with sampling locations and results for all environmental samples that have not been remediated.

Two hundred fifty (250) soil and sweep samples from Commercial Zone 4 were analyzed and passed EPA QA/QC requirements. Table 5-8 (p. 75) provides the TCDD concentrations for these samples. No samples were detected at or above 5 ppb TCDD. Twenty-seven (27) samples showed TCDD concentrations between 0.78 ppb and 5 ppb. In two hundred twenty-three (223) samples, TCDD was either not detected or detected less than 0.78 ppb.



COMMERCIAL ZONE 4
ENVIRONMENTAL SAMPLES NOT REMEDIATED
80 LISTER AVE., NEWARK, N.J.

(NOT TO SCALE)

LEGEND:

-  COMMERCIAL ZONE 4
-  ALL OTHER ZONES
-  DETECTED \geq 5 ppb
-  DETECTED \geq 0.78 ppb
-  DETECTED \leq 0.78 ppb
OR NOT DETECTED

FIGURE 5-9



 A Halliburton Company

6.0 CONCLUSION

Available CDC risk assessment documents are based upon TCDD concentrations in soil that are projected to remain relatively constant over time. The environmental half-life of TCDD originally thought to be about one year, has now been suggested to be at least 10 years. Contaminated dust found on streets within the study area will have characteristics that differ from soil sprayed with TCDD contaminated liquid. Relative to soil, dust particles along streets represent a transient condition. Natural forces, such as rainfall events and wind dispersion that result in dust movement, would increase the dust exposure to sunlight and, thus, the photolytic degradation process. This situation is entirely different from TCDD contaminated soils where the contaminant had been sprayed in a uniform manner over the ground for the purpose of dust suppression.

The sources of TCDD contamination in the study area have been identified. Now that controls have been instituted at sites that could act as high level TCDD contamination sources, and access to the contaminated areas is restricted, further dispersion or tracking of TCDD dust onto roadways is not expected.

For these reasons we propose to include only soil samples in "areas of concern," and not to include paved areas where TCDD levels have been confirmed only by sweep samples.

This sweep sample delineation affects the interpretation of only eight (8) TCDD measurements, of which half are already located within "areas of concern" based upon soil analyses. The four (4) sweep samples not within "areas of concern" have maximum values in a residential zone of 0.87 ppb (Residential Zone 1, Sample #64) and in a commercial zone of 7.3 ppb (Commercial Zone 2, Sample #681). In view of the transient character of the sweep sample media and time phasing of monitoring activities with site controls, these limited data do not ostensibly indicate any "areas of concern".

6.1 Residential Zones

Residential Zone 1 had seventeen (17) samples above the statistical cut-off level of 0.78 ppb that remained after remediation. Five (5) of these samples, sample numbers 64, 260, 685, 708, and 712, were sweep samples (see Figure 5-2, p.21).

Of these five (5) sweep samples, all, except Sample #64, are located within the "areas of concern" described below. Further sampling or remediation is recommended due to the results of soil analyses. Sample #64 is a sweep sample taken from a paved road detected at 0.87 ppb and no remediation is suggested.

Table 6-1 (p. 97) provides the TCDD concentrations for the remaining twelve (12) soil samples in Residential Zone 1 that had TCDD concentrations above 0.78 ppb.

Sample #220 is a parkway soil sample detected at 1.2 ppb, but is located in an area surrounded by several soil samples where no TCDD was detected (see Figure 5-2, p. 21). The source of the contamination is most probably occasional dust scattered from the formerly contaminated road. Because traffic from the 80 Lister and Brady sites has now been halted and geographically grouped soil samples show an average TCDD concentration of less than 0.78 ppb, no remediation will be undertaken in this area.

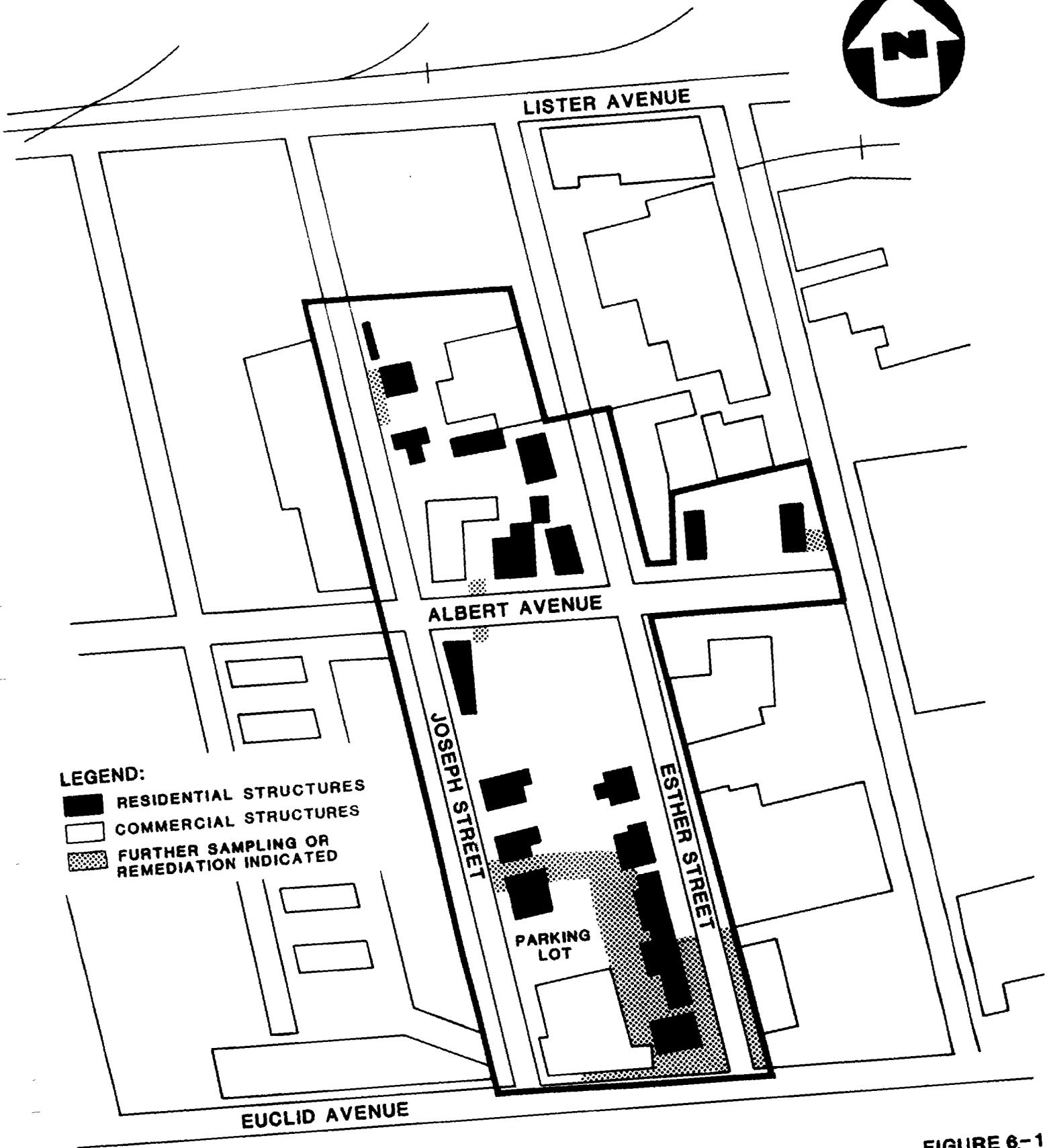
There are four (4) areas of concern in Residential Zone 1:

- 1) the parkway in front of #68 Joseph Street;
- 2) the parkways on either side of Albert Avenue between Joseph and Esther Streets;
- 3) the parkway on Lockwood Street near the corner of Albert Avenue; and
- 4) the area extending from the yard at #22 Joseph Street to the parkways on both sides of Esther Street.

Figure 6-1 shows Residential Zone 1 indicating these four (4) areas concern. Further sampling or remediation is recommended in these areas.

In Residential Zone 2 no samples were detected above 0.78 ppb. No further sampling or remediation is required.

Residential Zone 3 had three (3) samples above the statistical cut-off level of 0.78 ppb. One (1) of these samples, sample #654 was a sweep sample detected at 0.78 ppb (see Figure 5-4, p. 24). Because the contamination is a sweep sample from a paved commercial street, no further action is suggested.



LEGEND:

-  RESIDENTIAL STRUCTURES
-  COMMERCIAL STRUCTURES
-  FURTHER SAMPLING OR REMEDIATION INDICATED

RESIDENTIAL ZONE 1—AREAS OF CONCERN
80 LISTER AVE., NEWARK, N.J.

FIGURE 6-1



Table 6-2 (p. 98) provides the TCDD concentration for the remaining two (2) soil samples in Residential Zone 3 that had TCDD concentration above 0.78 ppb.

Sample #524 is a parkway soil sample with a corrected value of 1.1 ppb, and is located on the corner of Raymond Boulevard and Foundry Street (see Figure 5-4, p. 24). The only building near this sample is an industrial facility which faces Raymond Boulevard. The source of the contamination is most probably occasional dust scattered from commercial traffic leaving the Brady property. A sample taken across Foundry Street a little farther from Raymond Boulevard shows no TCDD detected. Because the contamination at the Brady site is now contained, and there are no residences in the immediate vicinity, no remediation is anticipated.

Sample #512 is a soil sample, with a corrected value of 0.81 ppb and is located between #14 and #18 Waydell Street (see Figure 5-4, p. 24). A sample just south along Waydell Street shows no detectable level of TCDD. Across the street from this sample, is Hayes Park which had nine samples with no TCDD detected and one sample detected at 0.55ppb. It should also be noted that this value of 0.81 ppb is a corrected value; the conservative lab bias correction factor of 24% has already been applied. Additional sampling may be warranted here, but has a lower priority since this is only one isolated result with a corrected value very close to the 0.78 ppb cut-off. We suggest no further action.

Residential Zone 4 had no detectable concentrations of TCDD in any of the samples. No further sampling or remediation is required.

6.2 Commercial Zones

In Commercial Zone 1 there remain, after remediation, two (2) soil samples with TCDD concentrations at or above 5 ppb. Table 6-3 (p. 99) provides the TCDD concentrations for these two (2) samples.

Sample numbers 143 and 151 were both composite soil samples taken from the sides of the driveway leaving the 80 Lister Avenue site (see Figure 5-6 p. 27). Thirteen (13) other samples taken from this driveway all resulted in TCDD

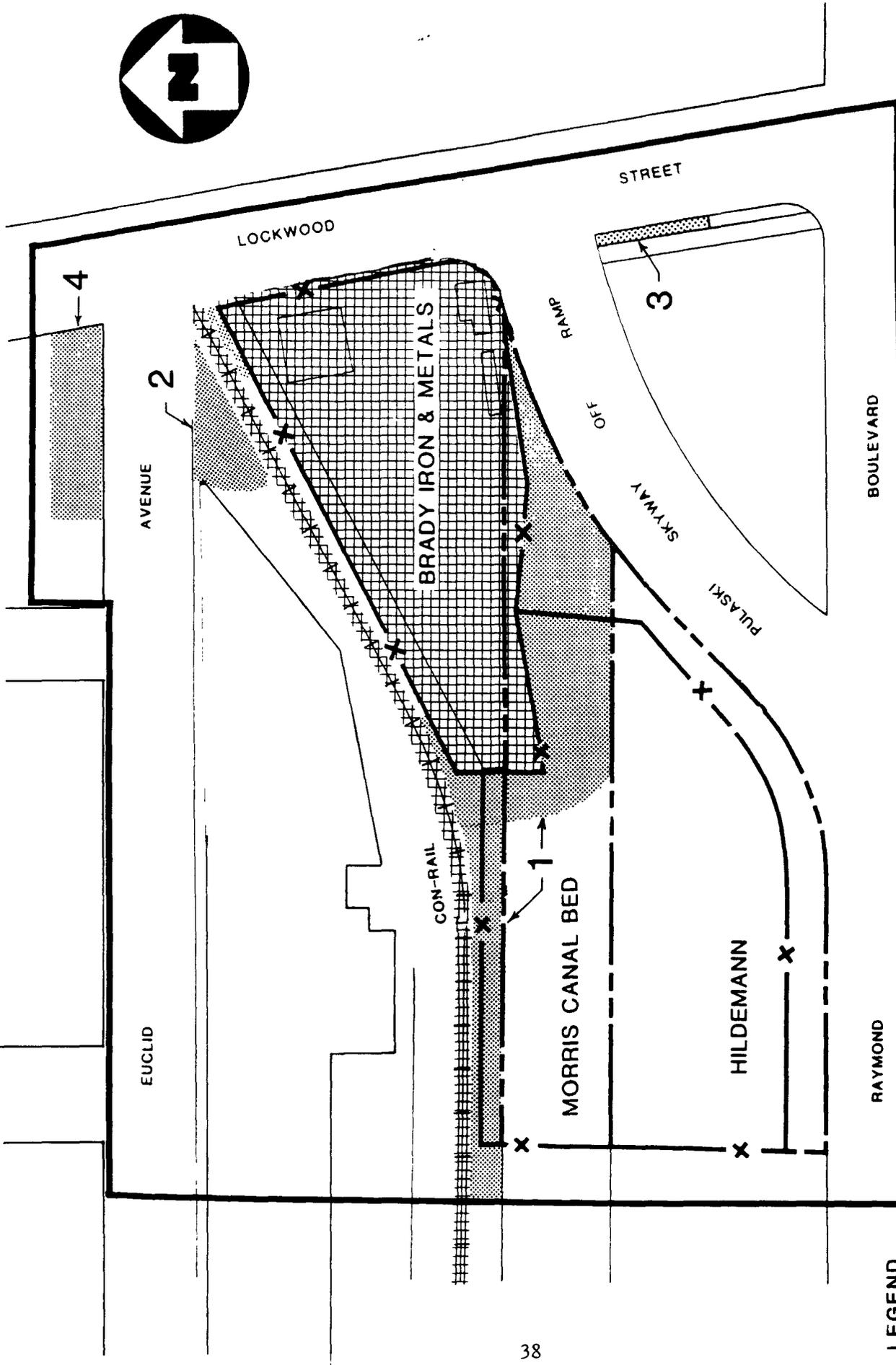
concentrations either not detected or less than 5 ppb. Because geographically grouped soil samples from this area show an average TCDD concentration of less than 5 ppb, no further sampling or remediation is required for this zone.

Commercial Zone 2 has been partially remediated. However, there are still twenty-two (22) samples outside of the Brady Iron and Metals property with TCDD concentrations at or above 5 ppb. One of the samples, #681, is a sweep sample from the paved Pulaski Skyway Off Ramp detected at 7.3 ppb TCDD (see Figure 5-7, p. 28). Because the sample is a sweep sample taken from a heavily traveled commercial street, no follow-up remediation is suggested.

Table 6-4 (p.100) provides the concentrations for the remaining twenty-one (21) soil samples in Commercial Zone 2 that have TCDD concentrations at or above 5 ppb after remediation. Seven (7) samples showed concentrations above 100 ppb, seven (7) samples were detected between 7 ppb and 100 ppb, and seven (7) samples had concentrations between 5 ppb and 7 ppb.

Figure 6-2 provides a map of Commercial Zone 2 indicating four (4) areas of concern.

1. The first area is located south and west of the Brady property. Within this area there are seventeen (17) with TCDD concentrations ranging from 5.6 ppb to 750 ppb (see Figure 5-7, p. 28). This contamination is most likely due to washover from the Brady property. It will be included in the extensive remediation that is being considered for the Brady Iron and Metals property.
2. The second area contains two (2) samples, #909 and #1000 with a TCDD concentration of 9.4 ppb and 5.6 ppb respectively. It is located outside the northeast corner of Brady Iron and Metals (see Figure 5-7, p. 28). This area will be remediated as an extension of the Brady Iron and Metals Remediation.



LEGEND.

REMEDIATED AREAS

AREA OF FURTHER SAMPLING OR REMEDIATION

COMMERCIAL ZONE 2-AREAS OF CONCERN
80 LISTER AVE., NEWARK, N.J.

(NOT TO SCALE)

FIGURE 6-2



A Halliburton Company

3. The third area of concern contains one sample, #899 with a TCDD concentration of 7.4 ppb. It is on the western parkway of Lockwood Street just south of the Pulaski Skyway Off-Ramp (see Figure 5-7, p. 28). Further sampling or remediation is required in this area.
4. The fourth area of concern contains one sample, #913 with a concentration of 6.5 ppb. It is located on the northern parkway of Euclid Avenue, on the corner of Lockwood Street (see Figure 5-7, p. 28). Further sampling or remediation is required in this area.

Commercial Zone 3 contains three (3) samples after remediation with TCDD concentrations above 5 ppb. One of these samples, #673 is a sweep sample from Lockwood Street in front of Brady Iron and Metals detected at 6.0 ppb TCDD (see Figure 5-8, p. 30). Because the contamination is a sweep sample taken from a paved commercial street, no remediation is anticipated.

Table 6-5 (p.103) provides the TCDD concentrations for the two remaining soil samples from Commercial Zone 3 with concentrations above 5 ppb after remediation.

Sample #577 has a concentration of 6.1 ppb. It is taken from the parking lot of Newark Box Board Company located on Lockwood Street between Albert and Euclid Avenues. There are two (2) other soil samples taken from this parking lot showing TCDD levels of 2.1 ppb and 1.7 ppb (see Figure 5-8, p. 30). It is alleged that Brady Iron and Metals stored their trucks on this property.

Sample #667 has a concentration of 5.3 ppb and is located on the corner of Raymond Boulevard and Lockwood Street. Another sample, #895, taken in the same spot a few weeks later, showed a concentration of 3.7 ppb. Two other samples taken just further east along Raymond Boulevard, #668 and #897, show TCDD concentrations of 2.6 ppb and 1.4 ppb respectively (see Figure 5-8, p. 30).

Because the contamination in both these areas is probably due to the traffic from the Brady site which has now been halted and because the geographically grouped soil samples from both areas show an average TCDD concentration of less than 5 ppb, remediation is not required for this zone.

Commercial Zone 4 did not have any samples with TCDD concentrations above 5 ppb. No further sampling or remediation is required for the zone.

References

1. Kimbrough, Renate D., M.D., Henry Falk, M.D., Paul Stehr, Dr.P.H., and George Fries, Ph.D., "Health Implications of 2,3,7,8-Tetrachlorodibenzodioxin (TCDD) Contamination of Residential Soil". Center for Environmental Health, Centers for Disease Control, Atlanta, Georgia (unpublished)
2. (Draft) "Interpretation of Environmental Data from Sites Potentially Containing Dioxin", Clinical Chemistry Division, Center for Environmental Health Centers for Disease Control, Atlanta, Georgia. April 6, 1983

8.0 TABLES

<u>Number</u>		<u>Page</u>
3-1	Summary of Sampling Phases	42
5-1	Residential Zone 1	44
5-2	Residential Zone 2	49
5-3	Residential Zone 3	51
5-4	Residential Zone 4	54
5-5	Commercial Zone 1	55
5-6	Commercial Zone 2	60
5-7	Commercial Zone 3	69
5-8	Commercial Zone 4	75
6-1	Residential Zone 1 Soil Samples Above 0.78 ppb	97
6-2	Residential Zone 3 Soil Samples Above 0.78 ppb	98
6-3	Commercial Zone 1 Soil Samples Above 5 ppb	99
6-4	Commercial Zone 2 Soil Samples Above 5 ppb	100
6-5	Commercial Zone 3 Soil Samples Above 5 ppb	103
8-1	Transportation Routes Sampling Key	104

**TABLE 3-1
SUMMARY OF SAMPLING PHASES
80 LISTER AVENUE, NEWARK, NEW JERSEY**

<u>Sampling Date</u>	<u>Sampling Phase</u>	<u>Sampling Type and Number</u>
5/27/83	On-Site	9 Soil
6/3/83	Habitability	2 Soil (Sweep) 4 Air Conditioner Filter 18 Vacuum Bag
6/7/83	Joseph Street and SCA Chemical Services	2 Soil 1 Air Conditioner Filter
6/8/83	Thomasset Colors, Inc.	2 Air Conditioner Filter
6/11/ - 6/17/83	Public Contact Areas Phase I	5 Vacuum Bag 10 Air Conditioner Filter 17 Sweeps 40 Soil
6/22/83 - 7/1/83	Transportation Routes Phase I	4 Sweep 1 Soil 83 Composite (Soil-Soil) 45 Composite (Sweep-Sweep) 43 Composite (Sweep-Soil)
6/28/83 - 6/29/83	Passaic River Sediment	35 Sediment
7/11/83 - 8/9/83	Selected Grid Phase I	157 Soil
7/14/83 - 7/15/83	Passaic River Crab and Fish	12 Fish (Collected by NJDEP) 4 Crab
7/26/83	Public Contact Areas Phase II	10 Soil 5 Vacuum Bag 3 Air Conditioner Filter
8/11/83 - 8/18/83	Transportation Routes Phase II	5 Sweep 37 Soil 2 Composite (Soil-Soil)
8/16/83	17 Foundry Street	4 Soil
8/17/83	Hayes Park East After TAT Clean-up	4 Sweep

TABLE 3-1 (cont'd)
SUMMARY OF SAMPLING PHASES
80 LISTER AVENUE, NEWARK, NEW JERSEY

<u>Sampling Date</u>	<u>Sampling Phase</u>	<u>Sampling Type and Number</u>
9/1/83	Transportation Routes Post-Remedial Action	35 Composite (Sweep-Sweep)
9/15/83	Transportation Routes Phase III	12 Soil 1 Sweep 1 Composite (Soil-Soil) 16 Composite (Sweep-Sweep)
9/16/83 - 9/26/83	Industrial Areas	10 Sweep 1 Soil
9/20/83	Selected Grid Phase II	13 Sweep
10/07/83	Duplicate Samples from Transportation Routes Phase III and Selected Grid Phase II	6 Sweep 4 Soil
10/10/83	Brady Iron and Metals	10 Soil
10/18/83	Parkway Soil	41 Soil
10/20/83 - 10/28/83	Ferry Street	18 Composite (Sweep-Sweep)
10/22/83	Brady Iron and Metals Perimeter	35 Surface Soil 15 Subsurface Soil 2 Wipe 3 Sweep
10/26/83	Hildemann Property	18 Soil
10/27/83	New Jersey Transit	18 Air Conditioner Filter
11/8/83, 11/9/83, 11/15/83	Brady Iron and Metals Remedial Grid and Wipe	26 Subsurface Soil 13 Surface Soil 12 Surface Wipe
TOTAL:		879 Samples

TABLE 5-1
RESIDENTIAL ZONE 1
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION(a)	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
64	NW corner of Albert Ave. and Joseph Street	Sweep	0.87 (c)
220	Esther Street - Segment "QQ" (B) 111' from "O"	Composite (Soil-Soil)	1.2 (c)
221	Esther Street - Segment "OO" (R) - 154' from "O"	Composite (Soil-Soil)	2.0 (c)
222	Esther Street - Segment "QQ" (R) - 170' from "O"	Composite (Soil-Soil)	ND
223	Esther Street - Segment "RR" (B) - 132' from "O"	Composite (Sweep-Soil)	ND
230	Lockwood Street - Segment "J" (R) - 124' from "O"	Composite (Sweep-Soil)	1.1 (c)
235	Esther Street - Segment "PP" (R) - 48' from "O"	Composite (Sweep-Soil)	ND
236	Esther Street - Segment "OO" (B) - 99' from "O"	Composite (Soil-Soil)	ND
239	Euclid Avenue - Segment "KK" (R) - 46' from "O"	Composite (Sweep-Soil)	0.66 (c)
240	Esther Street - Segment "NN" (B) - 39' from "O"	Composite (Sweep-Soil)	ND
241	Euclid Avenue - Segment "KK" (B) - 113' from "O"	Composite (Sweep-Soil)	ND
242	Esther Street - Segment "NN" (R) - 25' from "O"	Composite (Soil-Soil)	2.7 (c)

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.
ND = Not Detected

TABLE 5-1 (cont'd)
RESIDENTIAL ZONE 1
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION(a)	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
255	Euclid Avenue - Segment "LL" (B) - 92' from "O"	Composite (Soil-Soil)	2.2 (c)
260	Joseph Street - Segment "HH" (R) - 146' from "O"	Composite (Sweep-Sweep)	0.78
264	Joseph Street - Segment "FF" (R) - 76' from "O"	Composite (Sweep-Sweep)	0.34
265	Joseph Street - Segment "FF" (B) - 197' from "O"	Composite (Sweep-Sweep)	ND
266	Joseph Street - Segment "GG" (B) - 67' from "O" Parkway	Composite (Soil-Soil)	0.45
267	Joseph Street - Segment "GG" (R) - 172' from "O"	Composite (Sweep-Sweep)	0.24
268	Joseph Street - Segment "DD" (B) - 155' from "O"	Composite (Sweep-Sweep)	ND
270	Joseph Street - Segment "DD" (R) - 36' from "O"	Composite (Sweep-Sweep)	0.27
271	Joseph Street - Segment "EE" (B) - 158' from "O"	Composite (Sweep-Sweep)	0.09
274	Joseph Street - Segment "EE" (R) - 56' from "O"	Composite (Sweep-Sweep)	0.27
276	Albert Avenue - Segment "WW" (R) - 54' from "O"	Composite (Soil-Soil)	1.4
277	Albert Avenue - Segment "UU" (R) - 30' from "O"	Composite (Sweep-Soil)	0.73
280	Albert Avenue - Segment "VV" (R) - 146' from "O"	Composite (Soil-Soil)	0.18

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.
ND = Not Detected

TABLE 5-1 (cont'd)

RESIDENTIAL ZONE 1

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION(a)	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
409	Lubriplate - Fisk Bros. Refinery Lockwood Street	Soil	0.28
410	Lubriplate - Fisk Bros. Refinery Albert Avenue	Soil	ND
565	Vacant lot between Joseph and Esther Sts., South of Albert Avenue	Soil	ND
567	Vacant lot between Joseph and Esther Sts., South of Albert Avenue	Soil	ND
568	Vacant lot between Joseph and Esther Sts., South of Albert Avenue	Soil	ND
569	#33 Esther Street	Soil	0.16 (c)
570	Glicken Brothers, Esther Street	Soil	1.2 (c)
595	102 Albert Avenue	Soil	ND
596	55 Esther Street	Soil	ND
597	55 Esther Street	Soil	ND
598	100 Albert Avenue	Soil	ND
599	60 Joseph Street	Soil	ND
600	22 Joseph Street	Soil	1.4 (c)
601	33 Esther Street	Soil	ND
684	Euclid Ave. - Segment "KK" (R) - 8' from "O"	Composite (Sweep-Sweep)	ND

- (a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
 (b) = Concentration shown is highest value reported where duplicate samples were run.
 (c) = Corrected for lab bias as noted in Appendix A.
 ND = Not Detected

TABLE 5-1 (cont'd)

RESIDENTIAL ZONE 1

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION(a)	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
685	Euclid Ave. - Segment "LL" (R) - 96' from "O"	Composite (Sweep-Sweep)	2.6
687	Esther St. - Segment "OO" (R) - 186' from "O"	Composite (Sweep-Sweep)	0.34
688	Esther St. - Segment "PP" (R) - 158' from "O"	Composite (Sweep-Sweep)	0.26
690	Esther Street - Segment "RR" (R) - 196' from "O"	Composite (Sweep-Sweep)	0.22
691	Albert Street - Segment "UU" (R) - 150' from "O"	Composite (Sweep-Sweep)	0.48
692	Esther Street - Segment "QQ" (R) - 22' from "O"	Composite (Sweep-Sweep)	0.16
708	68 Joseph St. - Segment "HH" (R) - 20' south of telephone pole	Composite (Sweep-Sweep)	1.5 (c)
712	68 Joseph St. - Segment "HH" (R) - 15' north of telephone pole	Composite (Sweep-Sweep)	1.7 (c)
914	Euclid Ave. - Segment "LL" North side of street 92' from "O"	Soil	2.0
915	Esther St. - Segment "NN" East side of street 25' from "O"	Soil	3.9
916	Esther St. - Segment "OO" West side of street 154' from "O"	Soil	1.0

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

TABLE 5-1 (cont'd)

RESIDENTIAL ZONE 1

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION(a)	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
918	Esther St. - Segment "NN" West side of street 25' from "O"	Soil	ND
920	Esther St. - Segment "QQ" West side of street 111' from "O"	Soil	ND
921	Esther St. - Segment "QQ" East side of street 111' from "O"	Soil	ND
922	Albert Ave. - Segment "WW" South side of street 54' from "O"	Soil	1.9
923	Albert Ave. - Segment "WW" North side of street 54' from "O"	Soil	0.41

(a) = For segment location refer to Transportation Route Sampling Key at the end of tables.
 (b) = Concentration shown is highest value reported where duplicate samples were run.
 ND = Not Detected

TABLE 5-2
RESIDENTIAL ZONE 2
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
83	Roosevelt Homes	Soil	ND
84	Roosevelt Homes	Soil	ND
86	Roosevelt Homes	Soil	ND
87	Roosevelt Homes	Soil	ND
90	Roosevelt Homes	Soil	ND
91	Roosevelt Homes	Soil	ND
92	Roosevelt Homes	Soil	ND
94	Roosevelt Homes	Soil	ND
95	Roosevelt Homes	Soil	0.20 (c)
98	Roosevelt Homes	Soil	ND
99	Roosevelt Homes	Soil	ND
100	Roosevelt Homes	Soil	ND
101	Roosevelt Homes	Soil	ND
102	Roosevelt Homes	Soil	ND
103	Roosevelt Homes	Soil	ND
106	Roosevelt Homes	Soil	ND
107	Roosevelt Homes	Soil	ND
108	Roosevelt Homes	Soil	ND

(b)= Concentration shown is highest reported where duplicate samples were run.
(c)= Corrected for lab bias as noted in Appendix A.
ND = Not Detected.

TABLE 5-2 (cont'd)

RESIDENTIAL ZONE 2

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
109	Roosevelt Homes	Soil	ND
110	Roosevelt Homes	Soil	ND
169	Chapel Street - Segment "W" (R) - 152' from "O"	Composite (Sweep-Sweep)	0.11
170	Chapel Street - Segment "W" (B) - 57' from "O"	Composite (Sweep-Sweep)	0.50
171	Chapel Steet - Segment "V" (R) - 94' from "O"	Composite (Sweep-Soil)	0.09
172	Chapel Street - Segment "V" (B) - 54' from "O"	Composite (Sweep-Sweep)	0.20
178	Chapel Street - Segment "Y" (B) - 181' from "O"	Composite (Sweep-Sweep)	0.09
179	Chapel Street - Segment "Y" (R) - 84' from "O"	Composite (Soil-Soil)	ND
180	Chapel Street - Segment "X" (B) - 198' from "O"	Composite (Soil-Soil)	0.20
181	Chapel Street - Segment "X" (R) - 118' from "O"	Composite (Sweep-Soil)	0.16
193	Chapel Street - Segment "Z" (B) - 100' from "O"	Composite (Sweep-Soil)	ND
194	Chapel Street - Segment "Z" (R) - 42' from "O"	Composite (Sweep-Sweep)	ND
477	Corner of Albert Ave. and Chapel Streets	Soil	0.14 (c)

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A..

ND = Not Detected.

TABLE 5-3
RESIDENTIAL ZONE 3
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
43	Hayes Park East SW corner of lawn	Soil	ND
44	Hayes Park East West edge of lawn	Soil	ND
45	Hayes Park East NW corner of lawn	Soil	ND
46	Hayes Park East NE corner of lawn	Soil	ND
48	Hayes Park East SE corner of lawn	Soil	ND
55	Hayes Park East Center of swimming pool	Sweep	ND
512	Lawn between #14 and #18 Waydell St. Approx. 2 ft. from first fence pole closest to #18	Soil	0.81 (c)
513	13 Foundry Street Approx. 2" from center of pole	Soil	ND
514	59 Waydell Street Approx. center of front yard. Approx. 6" from white fence	Soil	ND
516	72 Waydell Street Approx. 4" from center of basement window	Soil	ND

(b) = Concentration shown is highest reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A..

ND = Not Detected

TABLE 5-3 (cont'd)

RESIDENTIAL ZONE 3

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION(a)	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
518	30 Waydell Street Approx. 6" from fence between gate and front porch	Soil	ND
523	Corner of yard of 17 Foundry Street	Soil	0.36 (c)
524	Corner of Foundry St. and Raymond Blvd., 30 ft. west of light pole 85 V	Soil	1.1 (c)
624	17 Foundry Street	Soil	0.14 (c)
627	17 Foundry Street	Soil	0.12 (c)
628	17 Foundry Street	Soil	ND
629	17 Foundry Street	Soil	ND
654	Raymond Boulevard Segment "J1" (R)-54" from "O"	Sweep	0.78 (c)
658	Northwest corner of pool	Sweep	ND
659	Southeast corner of pool	Sweep	ND
661	Northeast corner of pool	Sweep	ND
662	Southwest corner of pool	Sweep	0.55 (c)

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A..

ND = Not Detected

TABLE 5-3 (cont'd)

RESIDENTIAL ZONE 3

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
776	Backyard, #19 Foundry Street	Soil	0.07
778	S.W. Corner of Intersection of Ferry and Waydell Streets	Sweep	ND

(b) = Concentration shown is highest reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-4
RESIDENTIAL ZONE 4
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
74	Hawkins Street School adjacent lot	Soil	ND
75	Hawkins Street School adjacent lot	Soil	ND
76	Hawkins Street School Hawkins Street	Sweep	ND
77	Hawkins Street School South side	Soil	ND
78	Hawkins Street School Near steps on SE side	Sweep	ND
79	Hawkins Street School Cortland St. Parkway	Soil	ND
80	Hawkins Street School Playground	Sweep	ND
81	Reformed Trinity Church yard behind house	Soil	ND
82	Reformed Trinity Church Ferry Street side	Soil	ND

(b) = Concentration shown is highest value reported where duplicate samples were run.
 ND = Not Detected.

TABLE 5-5
COMMERCIAL ZONE 1
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
138	80 Lister Avenue Driveway - Segment "A" (R) - 3' from "O"	Composite (Soil-Sweep)	ND
139	80 Lister Avenue Driveway - Segment "A" (B) - 9' from "O"	Composite (Soil-Sweep)	ND
140	80 Lister Avenue Driveway - Segment "A" (B) - 25' from "O"	Composite (Soil-Sweep)	ND
142	80 Lister Avenue Driveway - Segment "A" (R) - 36' from "O"	Composite (Soil-Sweep)	1.4 (c)
143	80 Lister Avenue Driveway - Segment "A" (R) - 52' from "O"	Composite (Soil-Sweep)	5.0 (c)
146	80 Lister Avenue Driveway - Segment "A" (B) - 55' from "O"	Composite (Soil-Sweep)	2.7 (c)
147	80 Lister Avenue Driveway - Segment "A" (R) - 76' from "O"	Composite (Soil-Sweep)	ND
149	80 Lister Avenue Driveway - Segment "A" (R) - 98' from "O"	Composite (Soil-Soil)	0.74 (c)
150	80 Lister Avenue - Segment "B" (B) - 45' from "O"	Composite (Soil-Soil)	ND
151	80 Lister Avenue Driveway - Segment "A" (B) - 87' from "O"	Composite (Soil-Soil)	5.0 (c)

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.
ND = Not Detected

TABLE 5-5 (cont'd)

COMMERCIAL ZONE 1

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
152	Lister Avenue - Segment "B" (R) - 73' from "O"	Composite (Soil-Soil)	1.2 (c)
153	Lister Avenue - Segment "B" (R) - 26' from "O"	Composite (Soil-Soil)	1.6 (c)
154	Lister Avenue - Segment "B" (B) - 93' from "O"	Composite (Soil-Soil)	ND
155	Lister Avenue - Segment "D" (R) - 52' from "O"	Composite (Soil-Sweep)	1.5 (c)
156	Lister Avenue - Segment "D" (B) - 22' from "O"	Composite (Soil-Soil)	ND
159	Lister Avenue - Segment "C" (R) - 37' from "O"	Composite (Soil-Sweep)	1.5 (c)
160	Lister Avenue - Segment "C" (B) - 18' from "O"	Composite (Soil-Sweep)	ND
162	Lister Avenue - Segment "C" (R) - 66' from "O"	Composite (Soil-Soil)	0.44
163	Lister Avenue - Segment "C" (B) - 100' from "O"	Composite (Soil-Soil)	1.4
360	Railroad - Segment "20" (B) - 28' from "O"	Composite (Sweep-Sweep)	ND
361	Railroad - Segment "20" (R) - 83' from "O"	Composite (Sweep-Sweep)	ND

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-5 (cont'd)

COMMERCIAL ZONE 1

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
363	Railroad - Segment "19" (R) - 96' from "O"	Composite (Sweep-Sweep)	ND
580	Sherwin Williams - Lister Avenue	Composite (Soil-Soil)	ND
581	Sherwin Williams - Lister Avenue	Composite (Soil-Soil)	1.6 (c)
582	Sherwin Williams - Lister Avenue	Composite (Soil-Soil)	0.93 (c)
583	Sherwin Williams - Lister Avenue	Composite (Soil-Soil)	0.88 (c)
695	Lister Ave. - Segment "C" (R) - 182' from "O"	Composite (Sweep-Sweep)	1.2 (c)
698	Lister Ave. - Segment "D" (R) - 90' from "O"	Composite (Sweep-Sweep)	ND
699	Lister Ave. - Segment "P" (R) - 81' from "O"	Composite (Sweep-Sweep)	ND
701	Lister Ave. - Segment "O" (R) - 44' from "O"	Composite (Sweep-Sweep)	0.12
702	Lister Ave. - Segment "C" (R) - 44' from "O"	Composite (Sweep-Sweep)	1.0 (c)

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported were duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-5 (cont'd)

COMMERCIAL ZONE 1

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
703	80 Lister Ave. - Driveway Segment "A" (R) - 91' from "O"	Composite (Sweep-Sweep)	2.6 (c)
704	80 Lister Ave. - Driveway Segment "A" (R) - 60' from "O"	Composite (Sweep-Sweep)	4.3 (c)
705	80 Lister Ave. - Driveway Segment "A" (R) - 14' from "O"	Composite (Sweep-Sweep)	0.83 (c)
706	80 Lister Ave. - Driveway Segment "A" (R) - 48' from "O"	Composite (Sweep-Sweep)	0.57 (c)
707	80 Lister Ave. - Driveway Segment "A" (R) - 23' from "O"	Composite (Sweep-Sweep)	0.86 (c)
711	Lister Ave. - Segment "B" (R) - 90' from "O"	Composite (Sweep-Sweep)	2.4
715	Railroad - Segment "40" (SCA) (R) - 80' from "O"	Composite (Sweep-Sweep)	ND
716	Railroad - Segment "38" (SCA) (R) - 169' from "O"	Composite (Sweep-Sweep)	ND
717	Railroad - Segment "35" (SCA) (R) - 74' from "O"	Composite (Sweep-Sweep)	0.13
719	Railroad - Segment "39" (SCA) (R) - 170' from "O"	Composite (Sweep-Sweep)	ND

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-5 (cont'd)
COMMERCIAL ZONE 1

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
754	Sherwin-Williams	Sweep	ND
755	Sherwin-Williams	Sweep	1.6
826	Sherwin-Williams	Soil	0.35
828	Sherwin-Williams	Sweep	0.11
829	Sherwin-Williams	Sweep	0.45
830	Railroad, Segment "34" (Duralac) (R) - 68' from "O" Old # - 713	Sweep	1.9
927	Lister Ave. - Segment "C" South side of street 100' from "O"	Soil	ND
928	Lister Ave. - Segment "B" South side of street 26' from "O"	Soil	ND
931	Lister Ave. - Segment "C" North side of street 100' from "O"	Soil	0.96
932	Lister Ave. - Segment "D" South side of street 52' from "O"	Soil	ND

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
 (b) = Concentration shown is highest value reported where duplicate samples were run.
 (c) = Corrected for lab bias as noted in Appendix A.
 ND = Not Detected

TABLE 5-6
COMMERCIAL ZONE 2
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION(a)	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
253	Euclid Avenue-Segment "MM" (B) - 51' from "O"	Composite (Soil-Sweep)	2.6 (c)
256	Euclid Avenue-Segment "LL" (R) - 126' from "O"	Composite (Soil-Soil)	0.60 (c)
519	Grass triangle median at intersection of Raymond Blvd. and Pulaski Skyway exit ramp. Approx. 50 ft. south of "Reward Sign"	Soil	ND
646	Raymond Boulevard-Segment "I1" (B) - 80' from "O"	Sweep	1.4 (c)
651	Raymond Boulevard-Segment "I1" (R) - 24' from "O"	Soil	1.0 (c)
652	Raymond Boulevard-Segment "J1" (B) - 84' from "O"	Soil	1.5 (c)
655	Raymond Boulevard-Segment "K1" (B) - 60' from "O"	Sweep	1.4 (c)
656	Raymond Boulevard-Segment "K1" (R) - 90' from "O"	Soil	1.0 (c)
663	Raymond Boulevard-Segment "L1" (B) - 45' from "O"	Soil	2.1 (c)
681	Pulaski Skyway Off Ramp-Segment-"N1" (R) - 14' from "O"	Composite (Sweep-Sweep)	7.3
683	Pulaski Skyway Off Ramp-Segment-"O1" (R) - 67' from "O"	Composite (Sweep-Sweep)	2.3
743	Adjacent to Tarped R.R. spur south of Euclid Avenue	Soil	6.5
744	Adjacent to Tarped R.R. spur south of Euclid Avenue	Soil	2.9

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.
ND = Not Detected

TABLE 5-6 (cont'd)

COMMERCIAL ZONE 2

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION(a)	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
745	Adjacent to Tarped R.R. spur south of Euclid Avenue	Soil	18
746	Adjacent to Tarped R.R. spur south of Euclid Avenue	Soil	3.1
780	Grass area North of Pulaski Skyway Off-Ramp	Soil	5.8
782	Grass area North of Pulaski Skyway Off-Ramp	Soil	5.7
886	Raymond Boulevard-Segment "J1" North side of street 84' from "O"	Soil	1.2
889	Raymond Boulevard-Segment "K1" North side of street 45' from "O"	Soil	0.99
899	Lockwood Street - Segment "CC" West side of street 36' from "O"	Soil	7.4
903	Lockwood Street-Segment "CC" West side of street 41' from "O"	Soil	3.5
908	Euclid Avenue-Segment "MM" South side of street 76' from "O"	Soil	2.6

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-6 (cont'd)

COMMERCIAL ZONE 2

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION(a)	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
909	Euclid Avenue-Segment "MM" South side of street 51' from "O"	Soil	9.4
912	Euclid Avenue-Segment "MM" North side of street 14' from "O"	Soil	3.1
913	Euclid Avenue-Segment "MM" North side of street 76' from "O"	Soil	6.5
1000	Two feet (2') outside the fenceline at northeast property corner. Old # BO-1	Soil, 0-4"	5.6
1001	Two feet (2') outside the fenceline at northeast property corner. Old # BO-2	Soil, 6-12"	ND
1002	Ten feet (10') outside fenceline at northeast property corner. Old # BO-3	Soil	2.4
1003	One hundred feet (100') west of northeast corner fencepost, 2' outside the fenceline. Old #BO-4	Soil	0.09
1004	One hundred feet (100') west of northeast corner fencepost, 2' outside the fenceline. Old # BO-6	Soil	ND
1005	Two hundred feet (200') west of northeast corner fencepost, 2' outside the fenceline. Old # BO-6	Soil	0.39

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

ND = Not Detected

TABLE 5-6 (cont'd)

COMMERCIAL ZONE 2

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
1006	Two hundred feet (200') west of northeast corner fencepost, 10' outside the fenceline. Old # BO-7	Soil	ND
1007	Three hundred feet (300') west of northeast corner fencepost, 2' outside the fenceline. Old #BO-8	Soil	725
1008	Northwest corner fenceline post, 10' north of the fenceline. Old # BO-9	Soil	0.70
1009	Twenty feet (20') south of the northwest corner fencepost, 2' outside the fenceline. Old # BO-10	Soil, 0-6" depth	28
1012	Twenty feet (20') south of the northwest corner fencepost, 2' outside the fenceline. Old # BO-11	Soil, 6-12" depth	0.35
1013	Twenty feet (20') south of the northwest corner fencepost, 2' outside the fenceline. Old #BO-12	Soil	6.5
1014	Twenty feet (20') south of the northwest corner fencepost, 10' outside the fenceline. Old #BO-13	Soil	3.9
1015	Forty feet (40') south of the northwest corner fencepost, 2' outside the fenceline. Old #BO-14	Soil	2.8

(b) = Concentration shown is highest value reported where duplicate samples were run.
 ND = Not Detected

TABLE 5-6 (cont'd)

COMMERCIAL ZONE 2

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
1016	Forty feet (40') south of the northwest corner fencepost, 10' outside the fenceline. Old #BO-15	Soil	2.3
1017	One hundred-twenty feet (120') east of the southwest corner fencepost, 2' outside the fenceline. Old #BO-16	Soil	623
1018	One hundred-twenty feet (120') east of the southwest corner fencepost, 2' outside the fenceline. Old #BO-17	Soil, 0-6"	750
1021	One hundred-twenty feet (120') east of the southwest corner fencepost, 2' outside the fenceline. Old #BO-18	Soil, 6-12" depth	30
1022	One hundred-twenty feet (120') east of the southwest corner fencepost, 10' outside the fenceline. Old #BO-19	Soil	340
1023	One hundred-forty feet 140' east of the southwest corner fencepost, 2' outside the fenceline. Old #BO-20	Soil	291

(b) = Concentration shown is highest value reported where duplicate samples were run.
 ND = Not Detected

TABLE 5-6 (cont'd)

COMMERCIAL ZONE 2

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
1024	One hundred-forty feet (140') east of the southwest corner fencepost, 10' outside the fenceline. Old #BO-21	Soil	401
1025	Two hundred feet (200') east of the southwest corner fencepost, 2' outside the fenceline. Old #BO-22	Soil	8.0
1026	Two hundred feet (200') east of the southwest corner fencepost, 10' outside the fenceline. Old #BO-23	Soil	2.2
1031	Morris Canal Bed 40' west of western edge of Brady Iron & Metals property, 20' off the north fenceline.	Soil	2.6
1032	Morris Canal Bed 100' west of western edge of Brady Iron & Metals property, 20' off the north fenceline.	Soil	0.21
1033	Morris Canal Bed 165' west of western edge of Brady Iron & Metals property, 20' off the north fenceline.	Soil	ND

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Not Detected

TABLE 5-6 (cont'd)

COMMERCIAL ZONE 2

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
1034	Morris Canal 40' west of western edge of Brady Iron & Metals property, north 110° E of fenceline.	Soil	0.81
1035	Hildemann property 98' west of western edge of Brady Iron & Metals property, north 110° E of fenceline.	Soil	ND
1038	Hildemann property 150' west of western edge of Brady Iron & Metals property, north 110° E of fenceline.	Soil	0.13
1039	Hildemann property 200' west of western edge of Brady Iron & Metals property, north 100° E of fenceline.	Soil	0.15
1040	Morris Canal Bed 2' south of south edge of Brady Iron & Metals property.	Soil	170
1041	Morris Canal Bed 12' south of south edge of Brady Iron & Metals property.	Soil	5.6

ND = Not Detected

(b) = Concentration shown is highest value reported where duplicate samples were run.

TABLE 5-6 (cont'd)
COMMERCIAL ZONE 2
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
1042	Morris Canal Bed 38' southwest of the intersection of fences on south side of Brady Iron & Metals property.	Soil	9.5
1043	Hildemann property 120' southwest of the intersection of fences on south side of Brady Iron & Metals property, north 140°.	Soil	0.28
1044	Hildemann property 165' southwest of the intersection of fences on south side of Brady Iron & Metals, north 140° W.	Soil	0.69
1047	Morris Canal Bed 56' south of south side of Brady Iron & Metals.	Soil	1.1
1048	Morris Canal Bed 66' south of south side of Brady Iron & Metals.	Soil	0.58
1049	Hildemann property 73' south of south side of Brady Iron & Metals.	Soil	0.52

(b) = Concentration shown is highest value reported where duplicate samples were run.

TABLE 5-6 (cont'd)
COMMERCIAL ZONE 2
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
1050	Hildemann property 73' south of south side of Brady Iron & Metals, 10' west of above samples.	Soil	0.24
1051	Hildemann property in center of box created by four previous samples.	Soil	0.58
1052	Hildemann property 66' south of south side of Brady Iron & Metals, 30' west of fenceline.	Soil	0.23

(b) = Concentration shown is highest value reported were duplicate samples were run.

TABLE 5-7
COMMERCIAL ZONE 3
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
214	Lockwood Street - Segment "K" (R) - 112' from "O"	Composite (Soil-Sweep)	1.5 (c)
232	Lockwood Street - Segment "L" (B) - 149' from "O"	Composite (Soil-Sweep)	3.2 (c)
233	Lockwood Street - Segment "M" (R) - 24' from "O"	Composite (Soil-Sweep)	1.9 (c)
234	Lockwood Street - Segment "M" (B) - 157' from "O"	Composite (Soil-Sweep)	2.4 (c)
245	Lockwood Street - Segment "L" (R) - 34' from "O"	Composite (Soil-Sweep)	0.87 (c)
246	Lockwood Street - Segment "CC" (R) - 36' from "O"	Composite (Soil-Soil)	3.4 (c)
247	Lockwood Street - Segment "CC" (B) - 41' from "O"	Composite Sweep (Soil-Soil)	4.1 (c)
249	Lockwood Street - Segment "BB" (R) - 80' from "O"	Composite (Soil-Sweep)	2.9 (c)
250	Lockwood Street - Segment "N" (B) - 29' from "O"	Composite (Soil-Sweep)	2.5 (c)
252	Lockwood Street - Segment "N" (R) - 14' from "O"	Composite (Soil-Sweep)	2.6 (c)

- (a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.

TABLE 5-7 (cont'd)

COMMERCIAL ZONE 3

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
572	Messinger Trucking, Lockwood Street	Soil	0.57 (c)
573	Newark Box Board Co., between Lockwood and Esther Streets	Soil	1.7 (c)
574	Messinger Trucking, Lockwood Street	Soil	1.4 (c)
577	Newark Box Board Co., between Lockwood and Esther Streets	Soil	6.1 (c)
578	Newark Box Board Co., between Lockwood and Esther Streets	Soil	2.1 (c)
605	R.R. Tracks - Segment "25" (R) - 34' from "O"	Soil	ND
606	R.R. Tracks - Segment "24" (R) - 34' from "O"	Soil	0.43 (c)
608	R.R. Tracks - Segment "26" (B) - 164' from "O"	Soil	0.97 (c)
609	R.R. Tracks - Segment "25" (B) - 141' from "O"	Soil	0.21 (c)
610	R.R. Tracks - Segment "26" (R) - 20' from "O"	Soil	1.2 (c)
612	R.R. Tracks - Segment "24" (B) - 64' from "O"	Soil	ND

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.
ND = Not Detected

TABLE 5-7 (cont'd)

COMMERCIAL ZONE 3

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
665	Raymond Boulevard - Segment "M1" (R) - 136' from "O"	Sweep	1.0 (c)
666	Pulaski Skyway - Segment "X1" (R) - 182' from "O"	Soil	1.9 (c)
667	Raymond Boulevard - Segment "L1" (R) - 196' from "O"	Soil	5.3 (c)
668	Raymond Boulevard - Segment "M1" (B) - 60' from "O"	Soil	2.6 (c)
669	Pulaski Skyway - Segment "X1" (B) - 110' from "O"	Soil	4.3 (c)
672	Lockwood Street - Segment "K" (R) - 168' from "O"	Composite (Sweep-Sweep)	1.3
673	Lockwood Street - Segment "BB" (R) - 2' from "O"	Composite (Sweep-Sweep)	6.0
675	Lockwood Street - Segment "M" (R) - 80' from "O"	Composite (Sweep-Sweep)	3.1
678	Lockwood Street - Segment "L" (R) - 170' from "O"	Composite (Sweep-Sweep)	1.2

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-7 (cont'd)

COMMERCIAL ZONE 3

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
679	Lockwood Street - Segment "N" (R) - 166' from "O"	Composite (Sweep-Sweep)	2.7
680	Euclid Avenue - Segment "MM" (R) - 114' from "O"	Composite (Sweep-Sweep)	0.76
682	Lockwood Street - Segment "CC" (R) - 46' from "O"	Composite (Sweep-Sweep)	1.8
725	Pulaski Skyway- Segment "Q1" (B) - 53' from "O"	Composite (Sweep-Sweep)	3.5
726	Pulaski Skyway - Segment "Q1" (R) - 186' from "O"	Composite (Sweep-Sweep)	0.71
733	Raymond Blvd. - Segment "N1" (B) - 5' from "O"	Composite (Sweep-Sweep)	0.19
734	Raymond Blvd. - Segment "N1" (R) - 150' from "O"	Composite (Sweep-Sweep)	0.13
783	Recycled Fibers Corp., Lockwood Street	Sweep	4.3

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-7 (cont'd)

COMMERCIAL ZONE 3

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
848	Exxon Station, Raymond Boulevard and Lockwood Street Old # = 784	Sweep	1.6
890	Lockwood Street - Segment "M" East side of street	Soil	1.0
891	Lockwood Street Segment "L" West side of street 149' from "O"	Soil	ND
892	Lockwood Street - Segment "K" West side of street 112' from "O"	Soil	ND
893	Lockwood Street - Segment "M" East side of street 157' from "O"	Soil	2.1
894	Pulaski Skyway - Segment "X1" North side of street 110' from "O"	Soil	1.8
895	Raymond Boulevard - Segment "L1" North side of street 196' from "O"	Soil	3.7
897	Raymond Boulevard - Segment "M1" North side of street 60' from "O"	Soil	1.4
898	Lockwood Street - Segment "CC" East side of street 41' from "O"	Soil	2.3

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-7 (cont'd)

COMMERCIAL ZONE 3

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
904	Lockwood Street - Segment "N" West side of street 29' from "O"	Soil	ND
906	Lockwood Street Segment "BB" East side of street 80' from "O"	Soil	0.81
907	Lockwood Street - Segment "N" West side of street 14' from "O"	Soil	1.8

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-8
COMMERCIAL ZONE 4
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
57	Farmer's Market North End of Crate Dist.	Soil	ND
59	Farmer's Market South End of Crate Dist.	Soil	ND
60	Farmer's Market West of Fish Market	Sweep	ND
61	Farmer's Market NW Corner of Albert Ave. & Catherine St.	Sweep	ND
62	Farmer's Market NE Corner of Albert Ave. & Cornelia St.	Soil	ND
65	Farmer's Market SW Corner of Market	Sweep	ND
68	Farmer's Market Telephone Pole in SE Corner	Soil	ND
69	Farmer's Market Catherine Street	Sweep	ND
71	Farmer's Market Nursery Planter Box	Soil	ND
72	Farmer's Market Catherine Street	Sweep	ND
73	Farmer's Market Potato Loading Area	Sweep	ND
165	Lister Ave.-Segment "E" (R) - 31' from "0"	Composite (Soil-Sweep)	0.34

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
(b) = Concentration shown is highest value reported where duplicate samples were run.
ND = Not Detected

TABLE 5-8 (cont'd)
COMMERCIAL ZONE 4
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
168	Lister Ave. -Segment "E" (B) - 87' from "0"	Composite (Soil-Sweep)	0.39
182	Lister Ave. -Segment "R" (B) - 70' from "0"	Composite (Sweep-Sweep)	ND
183	Lister Ave. -Segment "R" (R) - 2' from "0"	Composite (Sweep-Sweep)	0.59
190	Chapel Street-Segment "AA" (B) - 84' from "0"	Composite (Sweep-Sweep)	ND
191	Chapel Street-Segment "AA" (R)-36' from "0"	Composite (Soil-Sweep)	ND
195	Lister Ave. - Segment "T" (R) - 124' from "0"	Sweep	ND
196	Lister Ave. Segment "S" (B) - 80' from "0"	Composite (Sweep-Sweep)	ND
197	Lister Ave. Segment "S" (R) - 120' from "0"	Composite (Sweep-Sweep)	ND
198	Lister Ave. Segment "T" (B) - 79' from "0"	Composite (Sweep-Sweep)	ND
199	Chapel Street Segment "U" (B) - 145' "0"	Composite (Soil-Sweep)	ND
201	Chapel Street Segment "U" (R) -72' from "0"	Composite (Sweep-Sweep)	ND
202	Lister Ave. Segment "F" (R) - 84' from "0"	Composite (Soil-Sweep)	0.50 (c)

(a) = For segment location refer to Transportation Route Sampling key at the end of the tables.
(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.
ND = Not Detected

TABLE 5-8 (cont'd)

COMMERCIAL ZONE 4

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
203	Lister Ave. Segment "G" (R) - 170' from "0"	Composite (Soil-Sweep)	0.84 (c)
204	Lister Ave. Segment "F" (B) - 154' from "0"	Composite (Soil-Sweep)	0.25 (c)
205	Lister Ave. - Segment "G" (B)-55' from "0"	Composite (Sweep-Sweep)	0.17(c)
206	Esther St. - Segment "SS" (B) - 130' from "0"	Composite (Soil-Sweep)	1.4 (c)
209	Esther St. - Segment "SS" (R) - 98' from "0"	Composite (Soil-Sweep)	ND
211	Esther St. - Segment "TT" (B) - 138' from "0"	Composite (Soil-Sweep)	ND
212	Esther St. - Segment "TT" (R) - 58' from "0"	Composite (Soil-Soil)	ND
215	Lockwood St.-Segment "H" (R) - 16' from "0"	Composite (Sweep-Sweep)	ND
217	Lockwood St.-Segment "I" (B) - 147' from "0"	Composite (Sweep-Sweep)	ND
218	Lockwood St.-Segment "H" (B) - 73' from "0"	Composite (Soil-Sweep)	ND
261	Joseph St.-Segment "II" (R) - 126' from "0"	Composite (Soil-Sweep)	0.84
262	Joseph St.-Segment "HH" (B) - 47' from "0"	Composite (Soil-Sweep)	0.86

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-8 (cont'd)
COMMERCIAL ZONE 4
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
299	Railroad Segment "7" (R) - 192' from "0"	Composite (Sweep-Sweep)	ND
302	Railroad Segment "7" (B) - 48' from "0"	Composite (Soil-Soil)	1.2 (c)
315	Railroad Segment "8" (R) - 76' from "0"	Composite (Soil-Soil)	ND
316	Railroad Segment "10" (B) - 86' from "0"	Composite (Soil-Soil)	0.76 (c)
318	Railroad Segment "10" (R) 114' from "0"	Composite (Soil-Soil)	0.52 (c)
321	Railroad Segment "8" (B) - 56' from "0"	Composite (Soil-Soil)	ND
(325	Railroad Segment "11" (R) - 32' from "0"	Composite (Soil-Soil)	0.77 (c)
337	Harrison adjacent to storm sewer on SW side of Sanford Avenue	Sweep	ND
338	Harrison adjacent to storm sewer on SW side of Harrison Avenue	Sweep	ND
339	Harrison-Western side of Boylan Avenue.	Soil	0.12
372	Railroad-Segment "23" (R) - 32' from "0"	Composite (Soil-Soil)	2.3
373	Railroad-Segment "23" (B) - 186' from "0"	Composite (Soil-Soil)	0.77

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.
ND = Not Detected

TABLE 5-8 (cont'd)

COMMERCIAL ZONE 4

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
376	Vacant lot, corner of Lister Avenue and Joseph Street.	Soil	ND
377	Vacant lot, corner of Lister Avenue and Joseph Street.	Soil	ND
380	Vacant lot, corner of Lister Avenue and Joseph Street.	Soil	ND
381	Vacant lot, corner of Lister Avenue and Joseph Street.	Soil	ND
382	Vacant lot, corner of Lister Avenue and Joseph Street.	Soil	ND
383	Vacant lot, corner of Lister Avenue and Joseph Street.	Soil	ND
384	Vacant lot, corner of Lister Avenue and Joseph Street.	Soil	ND
385	Vacant lot, corner of Lister Avenue and Joseph Street.	Soil	0.41 (c)
386	Vacant lot, corner of Lister Avenue and Joseph Street.	Soil	ND

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-8 (cont'd)
COMMERCIAL ZONE 4
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
387	Vacant lot, corner of Lister Avenue and Joseph Street.	Soil	0.07 (c)
388	East side of Cornelia St.	Soil	1.09 (c)
390	East side of Cornelia St.	Soil	0.33 (c)
391	East side of Cornelia St.	Soil	0.93 (c)
392	East side of Cornelia St.	Soil	0.48 (c)
393	East side of Cornelia St.	Soil	0.76 (c)
394	B-Line Trucking, Esther Street	Soil	ND
395	B-Line Trucking, Esther Street	Soil	ND
397	B-Line Trucking, Esther Street	Soil	ND
398	B-Line Trucking, Esther Street	Soil	ND
399	B-Line Trucking, Esther Street	Soil	ND
405	B-Line Trucking, Esther Street	Soil	.031
406	B-Line Trucking, Esther Street	Soil	ND
407	B-Line Trucking, Esther Street	Soil	0.22

(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.
ND = Not Detected

TABLE 5-8 (cont'd)

COMMERCIAL ZONE 4

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
411	Lubri-plate Fisk Bros. refinery, Lockwood St.	Soil	1.7
412	Lubri-plate Fisk Bros. refinery, Lockwood St.	Soil	0.11 (c)
413	Lubri-plate Fisk Bros. refinery, Lockwood St.	Soil	ND
414	Area of R.R. spur trending SE from East end of Lister Avenue.	Soil	1.3
416	Area of R.R. spur trending SE from East end of Lister Avenue.	Soil	0.24
419	Area of R.R. spur trending SE from East end of Lister Avenue.	Soil	0.54
420	Area of R.R. spur trending SE from East end of Lister Avenue.	Soil	0.15
428	Atlas refinery, East end of Lister Avenue.	Soil	0.29
429	Atlas refinery, East end of Lister Avenue	Soil	ND
431	Atlas refinery, East end of Lister Avenue.	Soil	0.07 (c)
432	Atlas refinery, East end of Lister Avenue.	Soil	ND

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted Appendix A.

ND = Not Detected

TABLE 5-8 (cont'd)
COMMERCIAL ZONE 4
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
433	Atlas refinery, East end of Lister Avenue.	Soil	0.20 (c)
434	Atlas refinery, East end of Lister Avenue.	Soil	ND
436	Atlas refinery, East end of Lister Avenue.	Soil	0.55 (c)
437	Atlas refinery, East end of Lister Avenue.	Soil	0.57 (c)
438	Atlas refinery, East end of Lister Avenue.	Soil	ND
439	Benjamin-Moore, East end of Lister Avenue.	Soil	0.64 (c)
441	Benjamin-Moore, East end of Lister Avenue.	Soil	ND
442	Benjamin-Moore, East end of Lister Avenue.	Soil	0.33 (c)
444	Benjamin-Moore, East end of Lister Avenue.	Soil	NA
445	Benjamin-Moore, East end of Lister Avenue.	Soil	0.25 (c)
446	Benjamin-Moore, East end of Lister Avenue.	Soil	0.35 (c)
447	Benjamin-Moore, East end of Lister Avenue.	Soil	0.97 (c)
448	Benjamin-Moore, East end of Lister Avenue.	Soil	ND

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-8 (cont'd)

COMMERCIAL ZONE 4

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
449	Benjamin-Moore, East end of Lister Avenue.	Soil	ND
451	Crate supplier, Catherine Street.	Soil	0.17 (c)
452	Crate supplier, Catherine Street.	Soil	0.17 (c)
454	Benjamin-Moore, East end of Lister Avenue.	Soil	ND
455	Benjamin-Moore, East end of Lister Avenue.	Soil	0.11 (c)
456	Benjamin-Moore, East end of Lister Avenue.	Soil	0.58 (c)
457	Benjamin-Moore, East end of Lister Avenue.	Soil	ND
458	Fairmont Chemical, Blanchard Street.	Soil	0.82 (c)
459	Fairmont Chemical, Blanchard Street.	Soil	ND
460	Fairmont Chemical Blanchard Street.	Soil	0.10 (c)
462	Fairmont Chemical Blanchard Street.	Soil	0.21 (c)
463	Fairmont Chemical Blanchard Street.	Soil	0.62 (c)

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-8 (cont'd)
COMMERCIAL ZONE 4
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
464	Fairmont Chemical Blanchard Street.	Soil	ND
466	Fairmont Chemical, Blanchard Street.	Soil	0.05 (c)
467	Fairmont Chemical Blanchard Street.	Soil	ND
468	Fairmont Chemical Blanchard Street.	Soil	0.32 (c)
469	Fairmont Chemical Blanchard Street.	Soil	0.17 (c)
471	Fairmont Chemical Blanchard Street.	Soil	0.67 (c)
472	Fairmont Chemical Blanchard Street	Soil	ND
473	North side of Albert St.	Soil	0.10 (c)
475	Pilar Industries, corner of Lister Avenue and Chapel Street.	Soil	ND
476	Cellomer, corner of Albert and Cornelia Sts.	Soil	0.14
478	Pilar Industries, corner of Lister Avenue and Chapel Street.	Soil	ND
480	Stanley Tool Works, Chapel Street.	Soil	0.38 (c)

(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.
ND = Not Detected

TABLE 5-8 (cont'd)
COMMERCIAL ZONE 4
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
481	Stanley Tool Works, Chapel Street.	Soil	0.99 (c)
482	Stanley Tool Works, Chapel Street.	Soil	ND
483	Stanley Tool Works, Chapel Street.	Soil	ND
484	Stanley Tool Works, Chapel Street.	Soil	ND
485	Stanley Tool Works, Chapel Street.	Soil	ND
487	Stanley Tool Works, Chapel Street.	Soil	ND
488	Stanley Tool Works, Chapel Street.	Soil	ND
489	Stanley Tool Works, Chapel Street.	Soil	ND
491	Stanley Tool Works, Chapel Street.	Soil	ND
492	Stanley Tool Works, Chapel Street.	Soil	ND
493	Stanley Tool Works, Chapel Street.	Soil	ND
494	Stanley Tool Works, Chapel Street.	Soil	ND
496	Palmer Industries, Lister Avenue.	Soil	0.30

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for bias as noted in Appendix A.

ND = Not Detected

TABLE 5-8 (cont'd)

COMMERCIAL ZONE 4

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
522	Palmer Industries, Lister Avenue.	Soil	ND
525	Palmer Industries, Lister Avenue.	Soil	ND
526	Palmer Industries, Lister Avenue	Soil	0.16 (c)
527	Stanley Tool Works, Chapel Street	Soil	0.31 (c)
528	Palmer Industries, Lister Avenue	Soil	ND
530	Intercity Steel, corner of Chapel and Albert Sts.	Soil	ND
531	Intercity Steel, corner of Chapel and Albert Sts.	Soil	0.51 (c)
532	Intercity Steel, corner of Chapel and Albert Sts.	Soil	0.20 (c)
534	Intercity Steel, corner of Chapel and Albert Sts.	Soil	0.21 (c)
535	Intercity Steel, corner of Chapel and Albert Sts.	Soil	ND
537	Intercity Steel, corner of Chapel and Albert Sts.	Soil	ND
538	Intercity Steel, corner of Chapel and Albert Sts.	Soil	0.06 (c)

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-8 (cont'd)
COMMERCIAL ZONE 4
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
540	Intercity Steel, corner of Chapel and Albert Sts.	Soil	0.32 (c)
541	Trailer Vicinity Resampling, Cornelia Street	Soil	ND
542	Trailer Vicinity Resampling, Cornelia Street	Soil	ND
543	Trailer Vicinity Resampling, Cornelia Street	Soil	0.52 (c)
544	Trailer Vicinity Resampling, Cornelia Street	Soil	0.25 (c)
546	Trailer Vicinity Resampling, Cornelia Street	Soil	ND
547	Trailer Vicinity Resampling, Cornelia Street	Soil	ND
548	Trailer Vicinity Resampling, Cornelia Street	Soil	1.1 (c)
549	Trailer Vicinity Resampling, Cornelia Street	Soil	ND

(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.
ND = Not Detected

TABLE 5-8 (cont'd)
COMMERCIAL ZONE 4
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
551	Trailer Vicinity Resampling, Cornelia Street	Soil	0.81 (c)
552	Trailer Vicinity Resampling, Cornelia Street	Soil	ND
553	Stanley Tool Works	Soil	0.15 (c)
554	Adjacent to RR Tracks, West of Cornelia St.	Soil	0.53 (c)
555	Adjacent to RR Tracks, West of Cornelia St.	Soil	0.11 (c)
557	Adjacent to RR Tracks, West of Cornelia St.	Soil	ND
558	Adjacent to RR Tracks, West of Cornelia St.	Soil	0.12 (c)
559	Adjacent to RR Tracks, West of Cornelia St.	Soil	ND
560	Adjacent to RR Tracks, West of Cornelia St.	Soil	ND
562	Adjacent to RR Tracks, West of Cornelia St.	Soil	ND
563	Adjacent to RR Tracks, West of Cornelia St.	Soil	ND
584	Intercity Steel, Chapel Street	Soil	0.88 (c)

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-8 (cont'd)

COMMERCIAL ZONE 4

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
585	Intercity Steel, Chapel Street	Soil	ND
611	RR Tracks - Segment "30" (B) 40' from "O"	Soil	0.41 (c)
614	RR Tracks - Segment "31" (B) 60' from "O"	Soil	ND
615	RR Tracks - Segment "32" (B) 150' from "O"	Soil	ND
616	RR Tracks - Segment "32" (R) 84' from "O"	Soil	ND
617	RR Tracks - Segment "28" (B) 30' from "O"	Soil	ND
619	RR Tracks - Segment "29" (B) 120' from "O"	Soil	ND
620	RR Tracks - Segment "28" (R) 120' from "O"	Soil	ND
621	RR Tracks - Segment "30" (R) 154' from "O"	Soil	ND
622	RR Tracks - Segment "31" (R) 174' from "O"	Soil	ND
623	RR Tracks - Segment "29" (R) 42' from "O"	Soil	ND
630	Raymond Blvd. Segment "A1" (R) 172' from "O"	Soil	ND

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-8 (cont'd)

COMMERCIAL ZONE 4

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
632	Raymond Blvd. Segment "A1" (B) 48' from "O"	Soil	ND
633	Raymond Blvd. Segment "C1" (R) 156' from "O"	Soil	ND
634	Raymond Blvd. Segment "B1" (B) 132' from "O"	Soil	ND
635	Raymond Blvd. Segment "C1" (B) 30' from "O"	Soil	1.4 (c)
636	Raymond Blvd. Segment "B1" (R) 66' from "O"	Soil	0.69 (c)
638	Raymond Blvd. Segment "F1" (B) 155' from "O"	Soil	ND
640	Raymond Blvd. Segment "E1" (B) 100' from "O"	Soil	ND
641	Raymond Blvd. Segment "D1" (R) 14' from "O"	Sweep	ND
642	Raymond Blvd. Segment "F1" (R) 4' from "O"	Soil	ND
643	Raymond Blvd. Segment "E1" (R) 66' from "O"	Soil	0.56 (c)
644	Raymond Blvd. Segment "D1" (B) 105' from "O"	Soil	ND
645	Raymond Blvd. Segment "G1" (R) 17' from "O"	Soil	ND

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-8 (cont'd)

COMMERCIAL ZONE 4

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
647	Raymond Blvd. Segment "H1" (R) 167' from "O"	Soil	0.25 (c)
648	Raymond Blvd. Segment "G1" (B) 165' from "O"	Soil	0.38 (c)
649	Raymond Blvd. Segment "H1" (B) 36' from "O"	Soil	0.21 (c)
670	Lockwood St - Segment "H" (R) 122' from "O"	Composite (Sweep-Sweep)	0.30
671	Lockwood St. - Segment "I" (R) 68' from "O"	Composite (Sweep-Sweep)	0.51
674	Lockwood St. - Segment "J" (R) 7' from "O"	Composite (Sweep-Sweep)	0.39
689	Esther St. - Segment "SS" (R) 158' from "O"	Composite (Sweep-Sweep)	0.32
720	Pulaski Skyway - Segment "R1" (B) 145' from "O"	Composite (Sweep-Sweep)	0.35
722	Pulaski Skyway - Segment "RI" (R) 22' from "O"	Composite (Sweep-Sweep)	0.47
723	Pulaski Skyway - Segment "S1" (B) 57' from "O"	Composite (Sweep-Sweep)	0.09
724	Pulaski Skyway - Segment "S1" (R) 196' from "O"	Composite (Sweep-Sweep)	ND
728	Raymond Blvd. - Segment "O1" (R) 158' from "O"	Composite (Sweep-Sweep)	ND

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-8 (cont'd)

COMMERCIAL ZONE 4

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
729	Raymond Blvd. Segment "O1" (R) 63' from "O"	Composite (Sweep-Sweep)	ND
730	Raymond Blvd. Segment "P1" (R) 192' from "O"	Composite (Sweep-Sweep)	ND
731	Raymond Blvd. Segment "P1" (B) 46' from "O"	Composite (Sweep-Sweep)	ND
735	Adjacent to tarped RR Spur West of Cornelia St.	Soil	0.16
736	Adjacent to tarped RR Spur South of Euclid Ave.	Soil	ND
737	Adjacent to tarped RR Spur South of Euclid Ave.	Soil	ND
738	Adjacent to tarped RR Spur South of Euclid Ave.	Soil	ND
739	Adjacent to tarped RR Spur West of Cornelia St.	Soil	0.13
741	Adjacent to tarped RR Spur West of Cornelia St.	Soil	ND
747	Benjamin-Moore	Sweep	ND
748	Railroad, Segment 37 (Benjamin-Moore) (R) 128' from "O"	Soil	0.18

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
 (b) = Concentration shown is highest value reported where duplicate samples were run.
 (c) = Corrected for lab bias as noted in Appendix A.
 ND = Not Detected

TABLE 5-8 (cont'd)

COMMERCIAL ZONE 4

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
749	Railroad, Segment 36, (SCA Gate) (R) 63' from "0"	Sweep	ND
756	Benjamin-Moore	Sweep	ND
757	Benjamin-Moore	Sweep	0.14
758	Benjamin-Moore	Sweep	0.51
759	Benjamin-Moore	Sweep	ND
762	NJ Transit Property Ferry St.	Sweep	0.13
763	NJ Transit Property Ferry St.	Sweep	0.21
764	NJ Transit Property Ferry St.	Sweep	1.3
765	NJ Transit Property Ferry St.	Soil	2.3
768	P & K Industries, Ferry & Foundry Streets	Sweep	ND
769	P & K Industries, Ferry & Foundry Streets	Soil	ND
770	P & K Industries, Ferry & Foundry Streets	Sweep	1.1

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-8 (cont'd)
COMMERCIAL ZONE 4
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
771	Abandoned RR Spur, South End of Foundry St.	Soil	ND
772	Sidewalk Median, South End of Foundry St.	Soil	0.14
777	SW Corner of Inter- section of Ferry & Waydell Streets	Sweep	0.77
779	Triangle Towing Services, Lockwood & Ferry Streets	Sweep	ND
839	NJ Transit Property, Ferry St. Old #761	Sweep	2.5
845	Sidewalk, Lockwood Street Old #773	Sweep	4.5
926	Esther St.- Segment "SS" East Side of Street 130' from "0"	Soil	ND

(a) = For sample location refer to Transportation Route Sampling Key at the end of the tables.
(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.
ND = Not Detected

TABLE 5-8 (cont'd)

COMMERCIAL ZONE 4

ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
933	Raymond Blvd. Segment "C1" North Side of St 30' from "0"	Soil	3.4
934	Ferry Street- Segment "Y1" (R) 12' from "0"	Composite (Sweep-Sweep)	ND
935	Ferry Street- Segment "Z1" (B) 15' from "0"	Composite (Sweep-Sweep)	ND
938	Ferry Street- Segment "Y1" (B) 128' from "0"	Composite (Sweep-Sweep)	ND
939	Ferry Street- Segment "Z1" (R) 85' from "0"	Composite (Sweep-Sweep)	ND
940	Ferry Street- Segment "X1" (B) 66' from "0"	Composite (Sweep-Sweep)	ND
941	Ferry Street- Segment "W1" (B) 65' from "0"	Composite (Sweep-Sweep)	ND
942	Ferry Street Segment "X1" (R) 8' from "0"	Composite (Sweep-Sweep)	ND
943	Ferry Street Segment "W1" (R) 184' from "0"	Composite (Sweep-Sweep)	1.4
944	Lockwood Street-Segment "B2" (B) 142' from "0"	Composite (Sweep-Sweep)	0.65

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.

(b) = Concentration shown is highest value reported where duplicate samples were run.

(c) = Corrected for lab bias as noted in Appendix A.

ND = Not Detected

TABLE 5-8 (cont'd)
COMMERCIAL ZONE 4
ALL ENVIRONMENTAL SAMPLES NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION (b) (ppb)
945	Ferry Street-Segment "V1" (B) 174' from "0"	Composite (Sweep-Sweep)	ND
946	Lockwood Street-Segment "A2" (B) 83' from "0"	Composite (Sweep-Sweep)	0.92
949	Lockwood Street-Segment "B2" (R) 35' from "0"	Composite (Sweep-Sweep)	1.5
950	Ferry Street-Segment "V1" (R) 38' from "0"	Composite (Sweep-Sweep)	0.24
951	Lockwood Street-Segment "A2" (R) 198' from "0"	Composite (Sweep-Sweep)	1.7
952	Ferry Street-Segment "41" (B) 125' from "0"	Composite (Sweep-Sweep)	ND
953	Ferry Street-Segment "T1" (B) 27' from "0"	Composite (Sweep-Sweep)	ND
954	Ferry Street-Segment "T1" (R) 106' from "0"	Composite (Sweep-Sweep)	ND
955	Ferry Street-Segment "U1" (R) 4' from "0"	Composite (Sweep-Sweep)	ND

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.
ND = Not Detected

TABLE 6-1
RESIDENTIAL ZONE 1
SOIL SAMPLES ABOVE 0.78 ppb NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION(a)	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
220	Esther Street - Segment "QQ" (B) - 111' from "O"	Composite (Soil-Soil)	1.2 (c)
221	Esther Street - Segment "OO" (R) - 111' from "O"	Composite (Soil-Soil)	2.0 (c)
230	Lockwood Street - Segment "J" (R) - 124' from "O"	Composite (Sweep-Soil)	1.1 (c)
242	Esther Street - Segment "NN" (R) - 25' from "O"	Composite (Soil-Soil)	2.7 (c)
255	Euclid Avenue - Segment "L" (B) - 92' from "O"	Composite (Soil-Soil)	2.2 (c)
276	Albert Avenue - Segment "WW" (R) - 54' from "O"	Composite (Soil-Soil)	1.4
570	Glicken Brothers, Esther Street	Soil	1.2 (c)
600	22 Joseph Street	Soil	1.4 (c)
914	Euclid Avenue - Segment "LL" North side of street 92' from "O"	Soil	2.0
915	Esther Street - Segment "NN" East side of street 25' from "O"	Soil	3.9
916	Esther Street - Segment "OO" West side of street 154' from "O"	Soil	1.0
922	Albert Avenue - Segment "WW" South side of street 54' from "O"	Soil	1.9

(a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.

TABLE 6-2

RESIDENTIAL ZONE 3

SOIL SAMPLES DETECTED ABOVE 0.78 ppb NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
512	Lawn between #14 and #18 Waydell St. Approx. 2 ft. from first fence pole closest to #18	Soil	0.81 (c)
524	Corner of Foundry Street and Raymond Blvd. 30 ft. west of light ple 55V	Soil	1.1 (c)

(b) = Concentration shown is highest value detected.

(c) = Corrected for lab bias.

TABLE 6-3

COMMERCIAL ZONE 1

SOIL SAMPLES DETECTED AT OR ABOVE 5.0 ppb NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
143	80 Lister Avenue Driveway Segment "A" (R) - 52' from "O"	Composite (Soil-Sweep)	5.0 (c)
151	80 Lister Avenue Driveway Segment "A" (B) - 87' from "O"	Composite (Soil-Soil)	5.0 (c)

- (a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
- (b) = Concentration shown is highest value reported where duplicate samples were run.
- (c) = Corrected for lab bias as noted in Appendix A.

TABLE 6-4
COMMERCIAL ZONE 2
SOIL SAMPLES DETECTED ABOVE 5.0 ppb NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION (a)	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
743	Adjacent to tarped railroad spur, south of Euclid Avenue	Soil	6.5
745	Adjacent to tarped railroad spur, south of Euclid Avenue	Soil	18.
780	Grass area North of Pulaski Skyway Off-Ramp	Soil	5.8
782	Grass area North of Pulaski Skyway Off-Ramp	Soil	5.7
899	Lockwood Street-Segment "CC" West side of street 36' from "O"	Soil	7.4
909	Euclid Avenue Segment "MM" South side of street 51' from "O"	Soil	9.4
913	Euclid Avenue-Segment "MM" North side of street 76' from "O"	Soil	6.5
1000	Two feet (2') outside the fenceline at northeast property corner. Old #BO-1	Soil, 0-4"	5.6
1007	Three hundred feet (300') west of northeast corner fencepost, 2' outside the fenceline. Old #B)-8	Soil	725
1009	Twenty feet (20') of the northwest corner fencepost, 2' outside the fenceline. Old #BO-10	Soil, 0-6" depth	28

a)= For segment location refer to Transportation Route Sampling Key at the end of the tables.
b)= Concentration shown is highest value reported where duplicate samples were run.
ND = Not Detected

TABLE 6-4 (cont'd)

COMMERCIAL ZONE 2

SOIL SAMPLES DETECTED ABOVE 5.0 ppb NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION(b) (ppb)
1013	Twenty feet (20') south of the northwest corner fencepost, 2' outside the fenceline. Old #BO-12	Soil	6.5
1017	One hundred-twenty feet (120') east of the southwest corner fencepost, 2' outside the fenceline. Old #BO-17	Soil	623
1018	One hundred-twenty feet (120') east of the southwest corner fencepost, 2' outside the fenceline. Old #BO-18	Soil, 0-6"	750
1021	One hundred-twenty feet (120') east of the southwest corner fencepost, 2' outside the fenceline Old #BO-18	Soil, 6-12" depth	30
1022	One hundred-twenty feet (120') east of the southwest corner fencepost 2' outside the fenceline. Old #BO-19	Soil	340
1023	One hundred-forty feet 140' east of the southwest corner fencepost, 2' outside the fenceline. OLD #BO-20	Soil	291

b)= Concentration shown is highest value reported where duplicate samples were run.
 ND = Not Detected

TABLE 6-4 (cont'd)

COMMERCIAL ZONE 2

SOIL SAMPLES DETECTED ABOVE 5.0 ppb NOT REMEDIATED

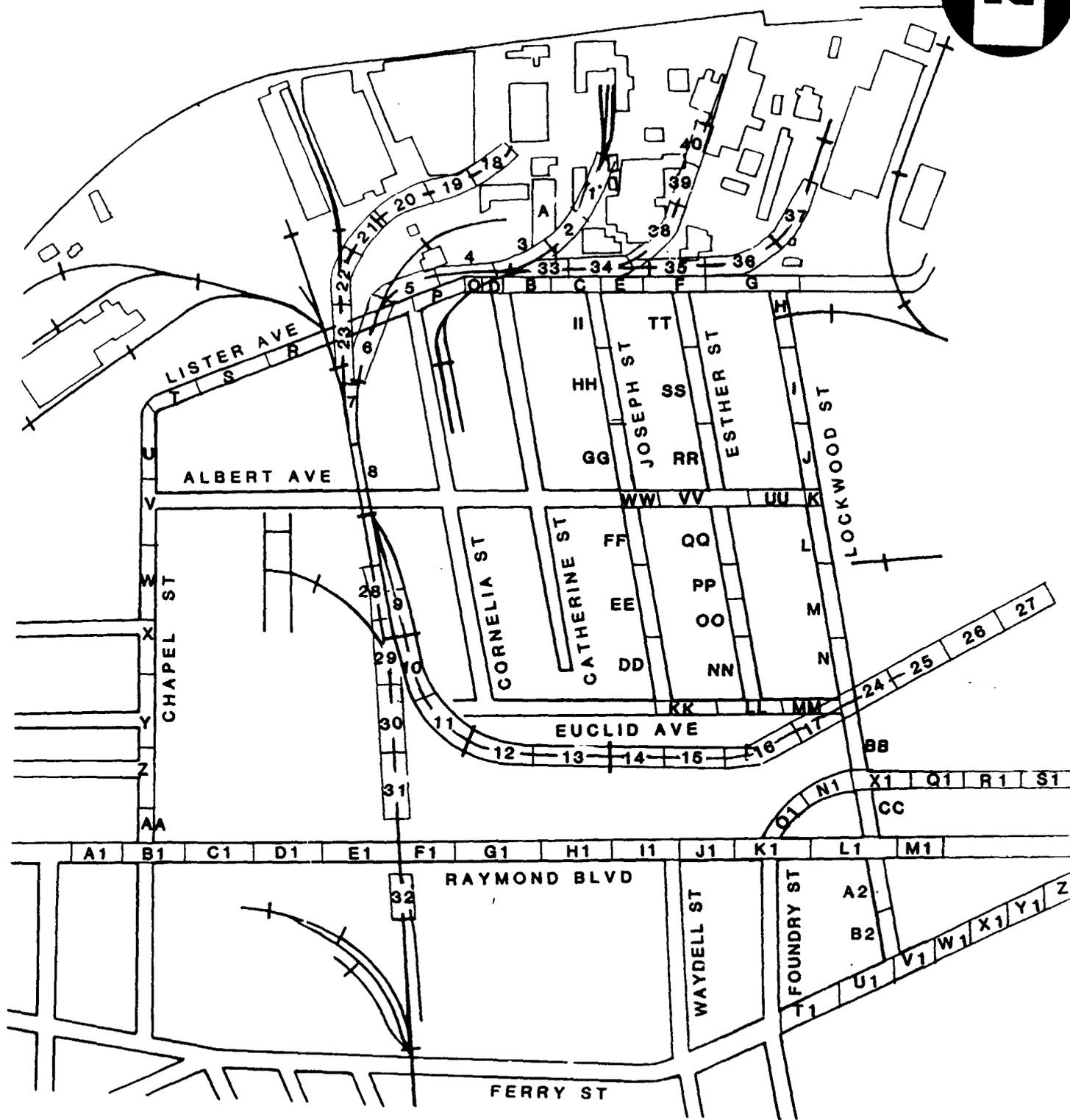
SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE TYPE	TCDD CONCENTRATION ^(b) (ppb)
1024	One hundred-forty feet (140') east of the southwest corner fencepost, 10' outside the fenceline. Old #BO-21	Soil	401
1025	Two hundred feet (200') east of the southwest corner fencepost, 2' outside the fenceline. Old #BO-22.	Soil	8.0
1040	Hildemann property 12' south of Brady Iron & Metals property. Old #H8	Soil	170
1041	Hildemann property 12' south of edge of Brady Iron & Metals property. Old #H9	Soil	5.6
1042	Hildemann Property 38' southwest of the intersection of fences on south side of Brady Iron & Metals property. Old #H10	Soil	9.5

b)= Concentration shown is highest value detected.
ND= Not Detected

TABLE 6-5
COMMERCIAL ZONE 3
SOIL SAMPLES DETECTED ABOVE 5.0 ppb NOT REMEDIATED

SAMPLE NUMBER	SAMPLE LOCATION(a)	SAMPLE CONCENTRATION(b) TYPE	TCDD (ppb)
577	Newark Box Board Co. between Lockwood and Esther Streets	Soil	6.1 (c)
667	Raymond Boulevard - Segment "L1" (R) - 196' from "O"	Soil	5.3 (c)

- (a) = For segment location refer to Transportation Route Sampling Key at the end of the tables.
(b) = Concentration shown is highest value reported where duplicate samples were run.
(c) = Corrected for lab bias as noted in Appendix A.



TRANSPORTATION ROUTE SAMPLING KEY
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 8-1



 A Halliburton Company

APPENDIX A

BIAS ASSESSMENT FOR THE NEWARK

DIOXIN MONITORING PROGRAM

A-1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

March 14, 1984

DATE

SUBJECT

Bias Assessment for the Newark Dioxin Monitoring Program

RECEIVED

FROM

William A. Coakley
William A. Coakley, Superfund QA Coordinator
Monitoring Management Branch

MAR 14 1984

TO

Mark Haulenbeek, FIT Regional Project Officer
Surveillance & Monitoring Branch

NUS CORPORATION
REGION II
SENT TO _____

A critical aspect of the quality assurance protocol for Region II's dioxin monitoring program depends on the results obtained for the "native control sample." This QA sample is labeled "Reference Material A" (RM-A), and it is used to evaluate overall precision (sampling and analytical) of the monitoring system. The RM-A is given to the lab as a blind or unknown sample.

The values generated for the RM-A after September 15, 1983 by Environmental Testing and Certification (ETC), showed a significant increase from the values obtained prior to September 15th.

Quality assurance studies were undertaken because a review of the lab's procedures did not resolve the cause of the higher values. The results obtained for each study are given in the three right-hand columns of the Tables 1 through 5 of Attachment A. The two left-hand columns are data obtained on the same RM-A reference materials during the course of monitoring. The first column shows analytical results prior to September 15, 1983 and the second column shows analytical results after September 15, 1983.

Study #1 - This study, performed on October 10, 1983, showed that indeed ETC was generating higher values than previously reported prior to September 15, 1983 for results obtained on the same "RM-A" samples. These results are presented in the third column of Attachment A.

Study #2 - This study confirmed Study #1 findings of higher values after September 15, 1983. However, this study also included a standard reference material (SRM) of known dioxin concentration analyzed by fifteen laboratories. These SRM results showed ETC to obtain the same value reported by the other laboratories, therefore, ETC had no bias after September 15, 1983.

Study #3 - All previous reference materials used in Studies #1 and #2 were sent to a second laboratory (California Analytical Lab) along with the SRM. These results showed first, the SRM values were biased low by 23% in Study #3 and second, RM-A results are the same as values obtained by ETC before September 15th. It is therefore concluded that ETC values before September 15th were biased low.

The basic premise for application of the findings of Studies #2 and #3 is, if a lab obtains results biased above or below the SRM, then the associated samples are also biased. When CAL's values were recalculated using the 23% bias factor, the results were in agreement with ETC values obtained in Studies #1 and #2.

Since these RM-A's are at the 7 ppb concentration level, one must also ask whether any confidence interval derived at this level also applies to the 1 ppb level. Results obtained for "Reference Material F" (RM-F) indicate it contains 1.5 ppb of 2,3,7,8-TCDD. The standard deviation for the material is 0.1 ppb, which gives tighter coefficient of variation (cv) than the RM-A samples (cv = 0.77). However, these samples were dried and, therefore, do not reflect the undried conditions of the environmental samples. Further, since we wanted to simulate the greatest inclusion of error or the worst case situation (i.e., controls exhibiting larger cv), RM-A was chosen to evaluate data precision.

Based on the results of quality assurance data, I recommend the dioxin data be treated as follows:

1. Increase all environmental sample data generated prior to September 15, 1983 by the bias factor. Calculate the bias factor using the difference between the average values of "Reference Material A" generated before and after September 15th.
2. Increase all native control sample (Reference Material A) data generated prior to September 15th by the bias factor. Next, calculate the average concentration (\bar{x}) of Reference Material A using all the data points generated both before (adjusted for bias) and after September 15th. Also calculate the standard deviation, the coefficient of variation, and the 95% confidence interval for Reference Material A.

Attachment

cc: R. D. Spear (ES-SM)
G. McKenna (ES-MM)

COMPARISON OF Q/A REFERENCE MATERIALS
ANALYZED BEFORE AND AFTER 9/15/83

REVISED
3/14/84

ATTACHMENT A

A-4

INDEX

COMPARISON OF Q/A REFERENCE MATERIALS
ANALYZED BEFORE AND AFTER 9/15/83

<u>Q/A REFERENCE MATERIALS</u>	<u>TABLE</u>
Q/A Reference Materials sent to CAL on 2/23/84	1
Q/A Reference Material A	2
Q/A Reference Material D	3
Q/A Reference Material F	4
Q/A Reference Material LV (SRM)	5

TABLE 1

Q/A REFERENCE MATERIALS SENT TO CAL ON 2/23/84

COMPARISON OF Q/A REFERENCE MATERIALS
ANALYZED BEFORE AND AFTER 9/15/83

Q/A Reference Material	TCDD Concentration, Date of Analysis and Sample Number				CAL 2/23/84
	ETC Before 9/15/83	ETC After 9/15/83	ETC 10/10/83	ETC 11/29/83	
A	---	---	---	8.0 12/2/83 (1147)	5.6 (7.2)* (1147)
A	---	---	---	7.4 12/2/83 (1148)	5.7 (7.3)* (1148)
A	---	---	---	6.8 12/2/83 (1149)	5.2 (6.7)* (1149)
A	---	---	---	6.6 12/2/83 (1150)	5.2 (6.7)* (1150)
A	---	---	---	6.5 12/2/83 (1151)	6.3 (8.1)* (1151)
A	---	---	---	6.9 & 6.5 Dup 12/2/83 (1152 & 1152D)	5.7 (7.2)* (1152)
A	---	---	---	7.5 12/3/83 (1161)	4.9 (6.3)* (1161)
A	5.9 7/30/83 (474)	---	7.7 10/17/83 (866)	7.1 12/3/83 (1164)	5.0 (6.4)* (1164)

* Corrected for bias

TABLE 1 (cont'd)

Q/A REFERENCE MATERIALS SENT TO CAL ON 2/23/84

COMPARISON OF Q/A REFERENCE MATERIALS
ANALYZED BEFORE AND AFTER 9/15/83

Q/A Reference Material	TCDD Concentration, Date of Analysis and Sample Number				CAL 2/23/84
	ETC Before 9/15/83	ETC After 9/15/83	ETC 10/10/83	ETC 11/29/83	
A	5.9 8/31/83 (650)	—	6.0 10/18/83 (874)	6.4 12/3/83 (1166)	6.4 (8.2)* (1166)
A	6.5 & 5.8 Dup 9/13/83 (575 & 575D)	—	8.0 10/18/83 (875)	7.9 12/3/83 (1167)	4.5 (5.8)* (1167)
A	5.2 8/28/83 (618)	—	6.2 10/18/83 (876)	6.2 12/3/83 (1168)	5.1 (6.5)* (1168)
F	—	—	—	1.6 12/3/83 (1169)	1.0 (1.3)* (1169)
F	—	—	—	1.4 & 1.5 Dup 12/11/83 (1170 & 1170D)	1.4 (1.8)* (1170)
LV** (SRM)	—	—	—	—	2.8 (1171)
LV** (SRM)	—	—	—	—	3.2 (1172)
LV** (SRM)	—	—	—	—	3.2 (1173)

Corrected for bias

*Standard Reference Material
containing average of 4.0 ppb
2,3,7,8-TCDD

TABLE 1 (cont'd)

Q/A REFERENCE MATERIALS SENT TO CAL ON 2/23/84

COMPARISON OF Q/A REFERENCE MATERIALS
ANALYZED BEFORE AND AFTER 9/15/83

Q/A Reference Material	TCDD Concentration, Date of Analysis and Sample Number				CAL 2/23/84
	ETC Before 9/15/83	ETC After 9/15/83	ETC 10/10/83	ETC 11/29/83	
LV** (SRM)	---	---	---	---	3.1 (1174)
LV** (SRM)	---	---	---	---	3.1 (1175)
F	---	---	---	---	(1178)
F	---	---	---	---	1.1 (1.4)* (1179)
A	---	---	---	---	5.7 (7.3)* (1180)
A	---	---	---	---	4.9 (6.3)* (1181)

* Corrected for bias

**Standard Reference Material
containing average of 4.0 ppb
2,3,7,8-TCDD

TABLE 2

COMPARISON OF Q/A REFERENCE MATERIAL A
ANALYZED BEFORE AND AFTER 9/15/83

Q/A Reference Material	TCDD Concentration, Date of Analysis and Sample Number				
	ETC Before 9/15/83	ETC After 9/15/83	ETC 10/10/83	ETC 11/29/83	CAL 2/23/84
A	6.0 7/23/83 (400)	—	8.1 10/17/83 (859)	6.9 12/3/83 (1163)	—
A	5.9 7/30/83 (474)	—	7.7 10/17/83 (866)	7.1 12/3/83 (1164)	5.0 (6.4)* (1164)
A	6.0 8/7/83 (23-Blue Spruce)	—	6.4 10/17/83 (868)	—	—
A	5.8 8/9/83 (495)	—	7.0 10/19/83 (869)	—	—
A	5.6 8/11/83 (550)	—	6.8 & 6.2 Dup. 10/17/83 (873 & 873D)	7.2 12/3/83 (1165)	—
A	10 8/18/83 (566)	—	6.4 10/17/83? (870)	—	—
A	5.2 8/28/83 (618)	—	6.2 10/18/83 (876)	6.2 12/3/83 (1168)	5.1 (6.5)* (1168)
A	6.0 8/19/83 (625)	—	6.7 & 8.2 Dup. 10/27/83 (871 & 871D)	—	—

* Corrected for bias

TABLE 2 (cont'd)

COMPARISON OF Q/A REFERENCE MATERIAL A
ANALYZED BEFORE AND AFTER 9/15/83

Q/A Reference Material	TCDD Concentration, Date of Analysis and Sample Number				CAL 2/23/84
	ETC Before 9/15/83	ETC After 9/15/83	ETC 10/10/83	ETC 11/29/83	
A	5.9 8/31/83 (650)	—	6.0 10/18/83 (874)	6.4 12/3/83 (1166)	6.4 (8.2)* (1166)
A	6.5 & 5.8 Dup 9/13/83 (575 & 575D)	—	8.0 10/18/83 (875)	7.9 12/3/83 (1167)	4.5 (5.8)* (1167)
A	—	8.8 9/25/83 (721)	6.4 10/18/83 (877)	—	—
A	—	8.9 9/27/83 (740)	7.0 10/18/83 (878)	—	—
A	—	9.7 10/11/83 (836)	7.1 10/18/83 (879)	—	—
A	—	9.6 10/11/83 (840)	6.5 10/18/83 (880)	—	—
A	—	10 10/11/83 (844)	6.8 10/18/83 (881)	—	—
A	—	8.3 10/11/83 (847)	7.2 10/18/83 (883)	—	—

* Corrected for bias

TABLE 2 (cont'd)

COMPARISON OF Q/A REFERENCE MATERIAL A
ANALYZED BEFORE AND AFTER 9/15/83

Q/A Reference Material	TCDD Concentration, Date of Analysis and Sample Number				CAL 2/23/84
	ETC Before 9/15/83	ETC After 9/15/83	ETC 10/10/83	ETC 11/29/83	
A	---	---	---	8.0 12/2/83 (1147)	5.6 (7.2)* (1147)
A	---	---	---	7.4 12/2/83 (1148)	5.7 (7.3)* (1148)
A	---	---	---	6.8 12/2/83 (1149)	5.2 (6.7)* (1149)
A	---	---	---	6.6 12/2/83 (1150)	5.2 (6.7)* (1150)
A	---	---	---	6.5 12/2/83 (1151)	6.3 (8.1)* (1151)
A	---	---	---	6.9 & 6.5 Dup 12/2/83 (1152 & 1152D)	5.7 (7.2)* (1152)
A	---	---	---	7.5 12/3/83 (1161)	4.9 (6.3)* (1161)
A	---	---	---	---	5.7 (7.3)* (1180)

* Corrected for bias

TABLE 2 (cont'd)

COMPARISON OF Q/A REFERENCE MATERIAL A
ANALYZED BEFORE AND AFTER 9/15/83

Q/A Reference Material	TCDD Concentration, Date of Analysis and Sample Number				CAL 2/23/84
	ETC Before 9/15/83	ETC After 9/15/83	ETC 10/10/83	ETC 11/29/83	
A	---	---	---	---	4.9 (6.3)* (1181)

*Corrected for bias

TABLE 3

COMPARISON OF Q/A REFERENCE MATERIAL D
ANALYZED BEFORE AND AFTER 9/15/83

Q/A Reference Material	TCDD Concentration, Date of Analysis and Sample Number				CAL 2/23/84
	ETC Before 9/15/83	ETC After 9/15/83	ETC 10/10/83	ETC 11/29/83	
D	3.3 & 3.6 Dup 7/17/83 (341 & 341D)	—	—	3.9 12/3/83 (1162)	—
D	3.0 7/23/83 (379)	—	—	3.5 12/3/83 (1160)	—
D	3.1 7/27/83 (435)	—	—	3.7 12/3/83 (1158)	—
D	3.5 7/29/83 (470)	—	—	3.6 12/3/83 (1159)	—

TABLE 4

COMPARISON OF Q/A REFERENCE MATERIAL F
ANALYZED BEFORE AND AFTER 9/15/83

Q/A Reference Material	TCDD Concentration, Date of Analysis and Sample Number				CAL 2/23/84
	ETC Before 9/15/83	ETC After 9/15/83	ETC 10/10/83	ETC 11/29/83	
F	---	---	---	1.6 12/3/83 (1169)	1.0 (1.3)* (1169)
F	---	---	---	1.4 & 1.5 Dup 12/11/83 (1170 & 1170D)	1.4 (1.8)* (1170)
F	---	---	---	---	(1178)
F	---	---	---	---	1.1 (1.4)* (1179)

*Corrected for bias

TABLE 5

COMPARISON OF Q/A REFERENCE MATERIAL LV (SRM)
ANALYZED BEFORE AND AFTER 9/15/83

Q/A Reference Material	TCDD Concentration, Date of Analysis and Sample Number				CAL 2/23/84
	ETC Before 9/15/83	ETC After 9/15/83	ETC 10/10/83	ETC 11/29/83	
LV (SRM) (15362)	---	---	---	4.1 12/2/83 (1153)	---
LV (SRM) (57113)	---	---	---	4.0 12/2/83 (1154)	---
LV (SRM) (22319)	---	---	---	3.9 12/3/83 (1155)	---
LV (SRM)	---	---	---	---	2.8 (1171)
LV (SRM)	---	---	---	---	3.2 (1172)
LV (SRM)	---	---	---	---	3.2 (1173)
LV (SRM)	---	---	---	---	3.1 (1174)
LV (SRM)	---	---	---	---	3.1 (1175)

ERRATA SHEET
FOR THE REPORT
"EVALUATION OF THE 80 LISTER AVENUE
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (TCDD)
DATA IN CONJUNCTION WITH AVAILABLE CDC
GUIDANCE DOCUMENTS"
DATED APRIL 10, 1984

- p.1 Sec. 1.1, para. 1 should read;
"Residential Zone 1 contains three (3) areas of concern. . . between
Joseph and Esther Streets; (3) the area extending from the yard at #22
Joseph. . ."
- p.2 In Figure 1-1 delete one area of cross-hatching in Residential Zone 1 on
the corner of Albert and Lockwood Streets.
- p.19 Sec. 5.1, para. 3 should read:
"Fifty-five (55) soil and sweep samples. . ."
- p. 19 Sec. 5.1, para. 4 should read:
"Sixteen (16) samples were detected at or above 6.78 ppb. . ."
- p. 21 In Figure 5-2, delete sample 230 from corner of Albert and Lockwood.
- p. 31 Sec. 5.8, para. 3 should read:
"Two hundred fifty-one (251) soil and sweep samples. . . No samples
were detected at or above 5 ppb TCDD. Twenty-eight (28) samples
showed TCDD concentrations. . ."
- p. 32 In Figure 5-9 add sample 230 to Commercial Zone 4, North of
intersection of Albert and Lockwood near sample 441.
- p. 33 Sec 6.1, para. 1 should read:
"Residential Zone 1 had sixteen (16) samples above the statistical. . ."

ERRATA SHEET (Cont'd)

- p. 34 Sec. 6.1, para. 2 should read:
 "Table of 6-1 (p. 97) provides the TCDD concentrations for the remaining eleven (11) soil samples in Residential Zone 1. . ."
- p. 34 Sec. 6.1, para. 4 should read:
 "There are three (3) areas of concern. . . 3) the area extending from the yard at #22 Joseph Street. . ."
- p. 34 Sec. 6.1, para 5 should read:
 "Figure 6-1 shows Residential Zone 1 indicating these three (3) areas of concern."
- p. 35 In Figure 6-1 delete one area of cross-hatching in Residential Zone 1 on the corner of Albert Avenue and Lockwood Street.
- p. 44 In Table 5-1, delete sample 230.
- p. 77 In Table 5-8, add sample 230 after sample 218 as follows:
- | | | | |
|------|--|----------------------------|--------|
| "218 | Lockwood Street - Segment. . . | | |
| 230 | Lockwood Street - Segment "J"
(R) - 124' from "O" | Composite
(Sweep-Soil)" | 1.1(c) |
- p. 97 In Table 6-1, delete sample 230.