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ESTIMATION OF AIR EMISSIONS
FROM ABANDONED HAZARDOUS WASTE SITES
IN THE SOUTHEAST CHICAGO AREA

Final Report

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DISCLAIMER

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SUMMARY

This report documents and describes the methodologies employed to collect site-specific information and develop air emission estimates for abandoned hazardous waste sites within the Southeast Chicago study area. In total, 261 potential waste sites were identified within the study area (see Appendix A). Review of the available information for each potential site revealed that 90 of these sites should be removed from further consideration (Appendix B) and that additional information was required to assess the potential air emission impacts from 129 others (Appendix C).

The remaining 42 abandoned hazardous waste sites were modeled for air emissions potential of the substances listed in Table 1. The analyses performed included emissions estimations from landfills, waste piles/open dumps, surface spills, and disposal impoundments. The models selected for this study provide emissions estimates based on either volatilization or wind entrainment of contaminated particulate material. The total air emissions for each specific site was then calculated as the sum of the volatilization and fugitive particulate estimate for each specific substance present at the site. The resulting emissions total for the 42 abandoned hazardous waste sites identified in this study are presented in Table 2.

TABLE 1. SUBSTANCES INCLUDED IN INVENTORY

NON-CHLORINATED ORGANICS (19)	CHLORINATE ORGANICS (15)
Acrylamide	Allyl Chloride
Acrylonitrile	Benzyl Chloride
Benzene	Carbon Tetrachloride
Butadiene	Chloroform
Coke Oven Emissions	Dioxin
Diethanolamine	Epichlorohydrin
Dimethylnitrosamine	Ethylene Dibromide*
Diethylphthalate	Ethylene Dichloride
Ethyl Acrylate	Methyl Chloride
Ethylene	Methylene Chloride
Formaldehyde	Pentachlorophenol
Gasoline Vapors	Polychlorinated Biphenyls (PCBs)
Isopropylidene Diphenol	Propylene Dichloride
Melamine	Trichloroethylene
Nitrosomorpholine	Vinyl Chloride
Polycyclic Organic Matter	
Propylene Oxide	INORGANIC (8)
Styrene	Arsenic
Terephthalic Acid	Asbestos
	Beryllium
NON-CARCINOGENS (4)	Cadmium
Acetone	Chromium
Mercury	Nickel
Toluene	Titanium Dioxide
Xylene	Radionuclides

*Although ethylene dibromide is not, strictly speaking, chlorinated, it is halogenated and is included among chlorinated compounds due to chemical similarity.

TABLE 2. SUMMARY OF ESTIMATED AIR EMISSIONS FOR IDENTIFIED
ABANDONED HAZARDOUS WASTE SITES

NAME OF SITE	POLLUTANT CODE	EMISSIONS (metric tons)	POLLUTANT NAME
ALBURN INC.	12103	2.2E-05	Arsenic
ALBURN INC.	12112	7.8E-05	Chromium
ALBURN INC.	45399	5.6E-05	PCB
ALLIED CHEM CORP	12110	1.5E-06	Cadmium
ALLIED CHEM CORP	12136	7.5E-06	Nickel
AMCA INT'L	12110	5.6E-08	Cadmium
AMCA INT'L	12112	2.8E-07	Chromium
AMCA INT'L	45399	1.5E-04	PCB
AMOCO RESEARCH	45399	4.8E-09	Arochlor-1254
AMOCO RESEARCH	45890	5.0E-04	Hexachlorobenzene
AMOCO RESEARCH	46708	9.8E-07	Phenanthrene
AMOCO RESEARCH	46719	9.0E-07	Benz(A)pyrene
ANDERSON DEV	12103	7.8E-08	Arsenic
ANDERSON DEV	12105	1.7E-08	Beryllium
ANDERSON DEV	12110	9.1E-08	Cadmium
ANDERSON DEV	12112	1.9E-07	Chromium
ANDERSON DEV	12142	1.3E-09	Mercury
ANDERSON DEV	45220	1.0E-08	Styrene
ANDERSON DEV	45999	5.9E-08	Diocetylphthalate
ANDERSON DEV	46717	8.0E-06	Benzofluoranthene
BAIRSTOW CO	12103	2.2E-04	Arsenic
BAIRSTOW CO	12136	3.0E-04	Nickel
BAIRSTOW CO	12142	1.7E-06	Mercury
BAIRSTOW CO	46708	9.1E-05	Phenanthrene
BAIRSTOW CO	46710	1.8E-04	Fluoranthene
BAIRSTOW CO	46713	2.2E-04	Pyrene
BAIRSTOW CO	46717	2.4E-04	Benzofluoranthene
BAIRSTOW CO	46719	1.7E-04	Benz(a)pyrene
BAIRSTOW CO	46720	1.6E-04	Indenopyrene
BAIRSTOW CO	46721	1.7E-04	Benzoperylene
BONGI CARTAGE	12112	2.9E-05	Chromium
B+O RR-BARR YARD	43704	1.9E-07	Acrylonitrile
B+O RR-BARR YARD	53414	2.5E-05	Pentachlorophenol
CALUMET IND	12136	4.7E-06	Nickel
CALUMET IND	45399	4.5E-05	Arochlor 1260
CHICAGO PLT YARD	45202	3.7E-04	Toluene
CHICAGO STREETS	12110	2.0E-04	Cadmium
CHICAGO STREETS	12136	1.0E-03	Nickel
CHICAGO STREETS	12142	1.3E-06	Mercury
CITIES SERVICE	43815	1.9E-05	2-methylnapthalene

TABLE 2. SUMMARY OF ESTIMATED AIR EMISSIONS FOR IDENTIFIED
ABANDONED HAZARDOUS WASTE SITES

NAME OF SITE	POLLUTANT CODE	EMISSIONS (metric tons)	POLLUTANT NAME
CITIES SERVICE	46708	1.2E-05	Phenanthrene
CITIES SERVICE	46710	1.0E-03	Benz(A)pyrene
CITIES SERVICE	46710	1.3E-05	Fluoranthene
CITIES SERVICE	46713	1.2E-05	Pyrene
CITIES SERVICE	46715	5.6E-05	Chrysene
CITIES SERVICE	46716	3.4E-05	Benzoanthracene
D & H	12103	5.6E-07	Arsenic
D & H	12112	3.0E-05	Chromium
D & H	12142	2.0E-08	Mercury
D & H	45399	1.1E-08	PCB
ESTECH CHEMICAL	51104	5.7E-09	Chlordane
ESTECH CHEMICAL	52119	1.0E-08	Parathion
FLEXIFLOW	12110	1.7E-11	Cadmium
FLEXIFLOW	43815	1.9E-07	1,2-dichlorethylene
FLEXIFLOW	43824	1.2E-07	Trichloroethylene
FLEXIFLOW	46713	4.0E-08	Pyrene
FLEXIFLOW	46716	2.5E-07	Benzoanthrace
HALL ALUMINUM	12110	4.8E-06	Cadmium
HALL ALUMINUM	12112	3.9E-07	Chromium
HAMMOND COLD BA	12112	4.3E-07	Chromium
HAMMOND/ILLIANA	12112	9.7E-09	Chromium
HAMMOND/ILLIANA	12136	5.4E-09	Nickel
HAMMOND/ILLIANA	46701	5.0E-07	Naphthalene
HAMMOND/ILLIANA	46705	4.5E-07	Accnaphthalene
HAMMOND/ILLIANA	46708	2.1E-06	Phenanthrene
HAMMOND/ILLIANA	46709	4.8E-07	Anthracene
HAMMOND/ILLIANA	46710	2.1E-06	Fluoranthene
HAMMOND/ILLIANA	46713	2.8E-06	Pyrene
HAMMOND/ILLIANA	46721	9.1E-07	Benzoberylene
HOUSE`S J-YARD	12103	1.2E-06	Arsenic
HOUSE`S J-YARD	12105	1.2E-07	Beryllium
HOUSE`S J-YARD	12136	2.5E-06	Nickel
HOUSE`S J-YARD	43803	1.2E-05	Chloroform
HOUSE`S J-YARD	45999	5.7E-05	2-methylnaphthalene
HOUSE`S J-YARD	46708	1.2E-04	Phenanthrene
HOUSE`S J-YARD	46713	1.8E-04	Pyrene
IN HARBOR BELT	12110	1.5E-10	Cadmium
IN HARBOR BELT	12112	4.4E-10	Chromium
IN HARBOR BELT	12136	3.4E-10	Nickel
IN HARBOR BELT	46708	1.4E-06	Phenanthrene

TABLE 2. SUMMARY OF ESTIMATED AIR EMISSIONS FOR IDENTIFIED
ABANDONED HAZARDOUS WASTE SITES

NAME OF SITE	POLLUTANT CODE	EMISSIONS (metric tons)	POLLUTANT NAME
IN HARBOR BELT	46715	1.1E-06	Chrysene
IND CINDERS	12103	1.2E-04	Arsenic
IND CINDERS	12142	6.3E-07	Mercury
IND CINDERS	17299	1.8E-05	POMs
IND CINDERS	45399	4.3E-05	PCBs
IND CINDERS	45999	2.7E-05	Diethylphthalate
INTERLAKE LF + COKE	45201	8.2E-06	Benzene
INTERLAKE LF + COKE	45202	8.4E-06	Toluene
INTERLAKE LF + COKE	46701	1.6E-03	Naphthalene
INT. HARV.	12801	1.2E-04	Asbestos
JM FOSTER	12105	8.7E-06	Beryllium
JM FOSTER	12112	3.4E-05	Chromium
JM FOSTER	12142	5.3E-07	Mercury
KEIL CHEMICAL	12103	4.4E-05	Arsenic
KEIL CHEMICAL	12112	2.6E-04	Chromium
KEIL CHEMICAL	12136	7.8E-05	Nickel
KEIL CHEMICAL	17290	6.9E-07	Polycyclic organics
KEIL CHEMICAL	45202	6.2E-08	Toluene
LAND AND LAKES #2	12110	1.3E-05	Cadmium
LAND AND LAKES #2	12112	4.0E-06	Chromium
LAND AND LAKES #2	12142	1.6E-07	Mercury
LAND + LAKE #3	12103	2.9E-07	Arsenic
LAND + LAKE #3	12110	2.1E-06	Cadmium
LAND + LAKE #3	12112	1.1E-05	Chromium
LAND + LAKE #3	12136	7.4E-06	Nickel
LAND + LAKE #3	12142	2.9E-07	Mercury
LOBUE #2	12110	3.4E-06	Cadmium
LOBUE #2	12112	3.1E-06	Chromium
LOBUE #2	12142	6.7E-07	Mercury
LOBUE #2	45202	1.5E-03	Toluene
LURIA BROS.	12103	1.2E-05	Arsenic
LURIA BROS.	12110	7.8E-06	Cadmium
LURIA BROS.	12136	3.6E-05	Nickel
LURIA BROS.	12142	2.0E-04	Mercury
MOBIL CHEN/P DI	12110	3.2E-07	Cadmium
MOBIL CHEN/P DI	12142	6.1E-07	Mercury
MOBIL CHEN/P DI	43815	9.5E-07	1,2-dichlorobenzene
MOBIL CHEN/P DI	45102	1.4E-05	Xylene
MOBIL CHEN/P DI	45202	1.3E-06	Toluene
MOBIL CHEN/P DI	45399	4.8E-06	PCP

TABLE 2. SUMMARY OF ESTIMATED AIR EMISSIONS FOR IDENTIFIED
ABANDONED HAZARDOUS WASTE SITES

NAME OF SITE	POLLUTANT CODE	EMISSIONS (metric tons)	POLLUTANT NAME
MOBIL CHEN/P DI	45999	8.6E-06	Diocetylphthalate
MOBIL CHEN/P DI	45999	8.6E-07	2-methylnaphthalene
MOBIL CHEN/P DI	46701	1.7E-06	Naphthalene
MOBIL OIL	45102	5.0E+01	Xylene
MOBIL OIL	45202	7.0E+00	Toluene
MOBIL OIL	45203	1.2E+01	Ethyl Benzene
MORECO	46716	2.7E-04	Benzo(A)anthracene
MORECO	46719	6.4E-05	Benzo(A)pyrene
MSD#4 SLUDGE + BARREL	12112	1.7E-05	Chromium
NIPSCO #74	12105	1.3E-07	Beryllium
NIPSCO #74	12110	1.1E-07	Cadmium
NIPSCO #74	12112	7.6E-06	Chromium
NIPSCO #74	12142	2.3E-05	Mercury
OLD PULLMAN FARM	12103	4.0E-05	Arsenic
OLD PULLMAN FARM	12110	4.0E-05	Cadmium
OLD PULLMAN FARM	12112	1.3E-04	Chromium
OLD PULLMAN FARM	12136	6.5E-04	Nickel
RALSTON ST	12110	1.4E-05	Cadmium
RALSTON ST	12136	1.0E-04	Nickel
RIVERDALE CHEM	45899	1.2E-09	Dioxin
ROUSSELLE CORP	12112	3.1E-06	Chromium
ROUSSELLE CORP	12142	6.7E-07	Mercury
ROUSSELLE CORP	45202	8.4E-03	Toluene
SWIFT ADHESIVES	45399	2.9E-04	PCB
TRIEM STEEL	12112	5.6E-04	Chromium
TRIEM STEEL	46701	9.6E-02	Naphthalene
VULCAN MATS	12103	2.4E-10	Arsenic
VULCAN MATS	12112	4.6E-09	Chromium
VULCAN MATS	12142	2.9E-10	Mercury
WOLF LAKE TERM	12103	6.5E-07	Arsenic
WOLF LAKE TERM	12105	1.7E-07	Beryllium
WOLF LAKE TERM	12112	4.6E-06	Chromium
WOLF LAKE TERM	12136	4.8E-07	Nickel
WOLF LAKE TERM	43824	1.2E-06	Trichlorethylene

INTRODUCTION

Region V has compiled a comprehensive screening inventory of air carcinogens emitted in the Southeast Chicago area. This inventory includes both traditionally inventoried source categories, such as manufacturing facilities, highway vehicles, and consumer solvent usage, and some source categories not traditionally inventoried, such as wastewater treatment plants and hazardous waste treatment, storage, and disposal facilities. However, the inventory did not include an analysis of the potential air emissions from abandoned hazardous waste sites.

Given the substantial citizen interest in air emissions from proper and improper handling of hazardous waste, the estimation of emissions from improper waste handling/disposal would fill a potentially significant gap in an otherwise comprehensive screening inventory. The purpose of this work assignment was to provide a comprehensive screening inventory of air carcinogen emissions (see Table 1) from abandoned hazardous waste sites. The methodologies employed to compile the necessary information to develop emissions estimates for abandoned hazardous waste sites located in the Southeast Chicago area are discussed in the following pages.

PROJECT DESCRIPTION

Identification of Abandoned Hazardous Waste Sites

The first task involved in the completion of this project was to identify the abandoned hazardous waste sites located within the boundaries of the project area. The project area forms a square ranging in Universal Transverse Mercator (UTM) coordinates from 4585 to 4630 kilometers northing and from 420 to 466 kilometers easting in Zone 16.

The identification process began by compiling a list of the abandoned hazardous wastes sites from information in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). Data were obtained from sites located in Cook and Will Counties in Illinois and Lake County in Indiana. The total number of potential sites identified for the three counties was 453. Of these, only 237 were located within the boundaries of the study area.

This CERCLIS abandoned hazardous waste site list was then used to cross-check against the U.S. EPA-Region V, South Chicago Superfund project list and the Illinois Environmental Protection Agency (IEPA) site investigation summary data for completeness. Based on the results of these comparisons, the total number of potential abandoned hazardous waste sites identified within the study area included 169 sites in Cook County, 3 in Will County and 89 in Lake County, for a total of 261 potential sites. A complete listing of these sites is provided in Appendix A.

Review of Site-Specific Data

The next step in developing emissions estimates for the abandoned hazardous waste sites within the Southeast Chicago area was to obtain information which provided detailed discussion relating to the specific activities responsible for each hazardous waste site. This information was obtained through telephone interviews and written requests of state and federal officials.

Among the officials contacted were: Mr. Jeno Bruni, IEPA-Maywood Office; Mr. Bob Hilton, Lake County, Indiana Commissioner's Office; Mr. Tom Kraus, IEPA-Springfield; and Mr. Jim Ursic, Superfund/Technical Support Unit, EPA-Region V.

The material collected included site inspection reports, preliminary assessment/site investigations (PA/SIs), documentation for Hazard Ranking System (HRS) reports and any available summary data describing waste generation and disposal practices used at each site. In all, site-specific information was obtained from EPA-Regional Superfund Programs for 150 potential abandoned waste sites. This included information for 108 sites located in Indiana and 42 locations in Illinois. Additional summary data were provided by the IEPA Freedom of Information for 299 locations in Illinois (i.e., 296 in Cook County and 3 in Will County).

Further analysis of this information revealed that 90 of the identified 261 abandoned hazardous waste sites did not meet the selection criteria for this project and should be removed from further consideration. This decision to remove potential sites from further consideration was based on information that showed sites to be nonhazardous, active operations, RCRA permitted TSDFs, and/or handled wastestreams (see Table 1) beyond the scope of this study.

Insufficient data were available to properly determine the air emissions impact potential for 129 of the identified abandoned hazardous waste sites. Review of current data for these sites showed serious deficiencies in information delineating industry type, waste character, quantity, disposal/handling methods, facility size, and/or location. This type of information is essential to estimate air emissions from these sites. Comprehensive lists of both the non-hazardous/active sites and the sites with insufficient data are provided in Appendices B and C respectively.

Table 3 lists the remaining 42 abandoned hazardous waste sites. The data available for these sites provided enough detailed information to allow for the estimation of air emissions from these areas. Much of the information, however, was still incomplete, particularly information about wastestream characterization. In such cases, surrogate wastestreams were developed using reference materials such as the WET Model Hazardous Waste Data Base (SCS, 1984). A complete list of data inputs and site-specific assumptions used to calculate emissions estimates for these 42 abandoned hazardous waste sites is provided in tabular form in Appendix D.

TABLE 3. LIST OF ABANDONED HAZARDOUS WASTE SITES WITHIN THE
SOUTHEAST CHICAGO STUDY AREA MODELED FOR AIR EMISSIONS

FCID #	SITE NAME	CITY	COUNTY	LATITUDE	LONGITUDE
ILD000716852	ALBURN INC AKA AMERICAN INCINERATION	CHICAGO	COOK	41 40 56.3	087 33 26.3
ILD001833714	ALLIED CORP AKA PVS CHEMICALS INC	CHICAGO	COOK	41 40 20.0	087 33 11.0
ILD051069854	AMCA INTL	PARK FOREST SOUTH	WILL	41 27 25.0	087 40 40.0
IND074403296	ANDERSON DEVELOPMENT	GARY	LAKE	41 34 48	087 22 30
ILD980606347	B & O RR CO BARR YARD	RIVERDALE	COOK	41 38 20.0	087 39
IND980679021	BAIRSHOW H CO	HAMMOND	LAKE	41 39 40	087 30 40
IND980679047	BONGI CARTAGE	GARY	LAKE	41 35 18	087 24 42
IND074379306	CALLUMET COLLEGE AKA AMCOO RESEARCH FAC	HAMMOND	LAKE	41 40 30	087 29 12
IND014387880	CALLUMET IND	GARY	LAKE	41 35 18	087 24 42
ILD981194699	CHICAGO DEPT STREETS & SANITATION	CHICAGO	COOK	41 42	087 35
ILD980616460	CHICAGO PLT YARD	CHICAGO	COOK	41 47 45.0	087 46 30.0
IND980607469	CITIES SERV CO E CHGO REF	EAST CHICAGO	LAKE	41 38 18	087 28 42
IND096786884	DOMBROWSKI & HOLMES	HAMMOND	LAKE	41 37 48	087 30 18
ILD099213498	ESTECH GENL CHEM CO	CALLUMET CITY	COOK		
IND980679179	FLEXIFLO	HAMMOND	LAKE	41 35 42	087 26 54
ILD005246590	HALL ALUMINUM CO	CHICAGO HEIGHTS	COOK	41 30 5	087 37 5
IND981094071	HOUSE'S JUNK YARD	GARY	LAKE	41 35 18	087 24 42
IND004387842	HAMMOND COLD BAR & STEEL	GARY	LAKE	41 36	087 30
IND980500318	ILLIANA TRANSIT CORP	HAMMOND	LAKE	41 33 36	087 30 30
IND069984276	INDIANA HARBOR BELT RAILROAD	HAMMOND	LAKE	41 33 36	087 30 30
IND980679211	INDUSTRIAL CINDER INC. (#77)	GARY	LAKE	41 36	087 20
ILD000810432	INTERLAKE PROPERTY W H I	CHICAGO	COOK	41 43 18	087 32 06
ILD005213285	INTERNATIONAL HARVESTER	CHICAGO	COOK	41 41 30	087 39 42
IND980500599	J M FOSTER SITE (Site #9)	GARY	LAKE	41 36	087 28
IND005421755	KEIL CHEM	HAMMOND	LAKE	41 37 48	087 30 18
ILD981531882	LAND & LAKES #2	CHICAGO	COOK	41 38 37.0	087 35 36.5
ILD000672790	LAND AND LAKE #3	CHICAGO	COOK	41 40 57.0	087 34 30.0
ILD980902050	LOBUE #2	CHICAGO HEIGHTS	COOK	41 29	087 37
IND095264818	LURIA BROS & CO INC	GARY	LAKE	41 37 35	087 25 10
IND000606731	MOBIL CHEMICAL CO-PHOSPHO DIV	GARY	LAKE	41 35 30	087 18 45
IND042329631	MOBIL OIL CO E CHGO TERM	EAST CHICAGO	LAKE	41 38 42	087 28 50
ILD000646786	MOTOR OILS REFINING CO	MCCOOK	COOK	47 48 13.8	087 48 40.0
ILD980498349	MSD #4 SLUDGE & BARREL DUMP	CHICAGO	COOK	41 39 18	087 32 48
IND980500482	NIPSCO #74	GARY	LAKE	41 38 20	087 24 20
ILD981959208	OLD FULLMAN SEWAGE FARM	CHICAGO	COOK	41 39 18.0	087 35 46.0
IND077001808	RALSTON STREET LAAGOON	GARY	LAKE	41 36	087 20
ILD059446153	RIVERDALE CHEMICAL	CHICAGO HEIGHTS	COOK	41 30 00.0	087 37 30.0
ILD005086673	ROUSSELLE CORP	CHICAGO	COOK	41 45 11.3	087 40 36.7
IND060370343	SWIFT ADHESIVES & COATINGS	HAMMOND	LAKE	41 35 40	087 28 07
ILD001744572	TRIEM STEEL & PROCESSING INC	CHICAGO HEIGHTS	COOK	41 28 50.0	087 38 15.0
IND005444732	VULCAN MATERIALS CORP	GARY	LAKE	41 36 55	087 25 50
IND054101415	WOLF LAKE TERMINALS	HAMMOND	LAKE	41 37 48	087 30 18

EMISSION MODEL SELECTION

Background

A preliminary assessment of selected air toxic emissions from hazardous waste TSDFs has been completed for the southeast area of Chicago (MRI, 1987). The effort used available site-specific information and techniques (i.e., models) prescribed by EPA's Office of Air Quality Planning and Standards (OAQPS). The potential emission sources investigated at active TSDFs were hydrocarbon loading into drums and tank trucks, storage tanks, landfills and incinerators. Available information on abandoned hazardous waste sites indicates that potential emissions sources are different from the active sources described by MRI.

Abandoned waste sites reflect a variety of waste disposal processes, including landfills, waste dumps and piles, disposal impoundments and spill sites. The techniques prescribed by OAQPS are applicable to most of the processes encountered at these abandoned sites and have been used to estimate emissions from these sites where possible. However, these models were developed to estimate emissions of volatile hydrocarbons from active or recently active processes. Many abandoned sites have been inactive for a period of years and sampling results show few or no volatile species. Rather, present contamination consists of semi-volatile hydrocarbons (e.g., phenanthrene) and metals. While these pollutants are of concern (Table 1) due to airborne exposure, the principle mechanism considered by the models is volatilization. Due to low vapor pressures (semi-volatiles) or effectively no volatilization (metals), this mechanism generally is responsible for very low emissions. Because of this factor, emissions due to fugitive particulates

have been considered as a relatively significant portion of total emissions at these sites.

The remainder of this section describes the estimation techniques used to calculate emissions from the identified abandoned waste sites. Four disposal practices are considered: landfills; open dumps/waste piles; disposal impoundments; and surface spills. Five models are described covering closed landfills, open dumps/waste piles, oily soil from spills, disposal impoundments and fugitive particulates. Where these methods have been described in detail elsewhere (EPA-450/3-87-026), this presentation centers on the assumptions necessary to use these models for emissions estimation at abandoned sites. More detail has been furnished for fugitive particulates because no OAQPS prescribed method exists for TSDFs.

Closed Landfills

The RTI Closed-Landfill Model (EPA-450/3-87-026) was used to estimate emissions of VOCs from wastes in a closed (capped) landfill. Waste piles and open dumps (i.e., uncapped/no cover) were treated differently. The closed-landfill model was developed to estimate the time-dependent behavior of emissions by modeling diffusion through the cap and convective loss due to barometric pumping. The model inputs require a detailed waste constituency at closure as well as physical properties of the waste mixture and cover materials (e.g., air porosity).

The model is sensitive to a number of variables including air porosity of the cap and waste, mole fraction and physical properties of the waste, temperature, barometric pressure change, and area and depth of fill. The

model is relatively insensitive to cap thickness, total waste mass and diffusivity in air of the constituent wastes.

Because many of the landfills in this study were filled over a long period of time and have been closed for years, records on the extent and content of these fills were poor or nonexistent. The landfills in this study were modeled using the closed-landfill model whenever the site was described in PA/SI and/or State records as a landfill and it was known to be covered.

In applying the model, a number of simplifying assumptions were made because of the general lack of available data. Specific waste quantities and constituents were used when possible. Usually, however, waste constituent analysis was not available. In these cases, sampling data were considered reflective of current wastes in the landfill. Insofar as the samples characterized the actual waste constituents, the emissions reflect the wastes at the site. If no waste analyses or sampling data were available, default wastestreams were selected based on the available description of the waste.

No data were available that indicated the actual disposal techniques. It was assumed that volatile wastes were part of a dilute aqueous wastestream that had been mixed with a dry fixative. The resulting volume was assumed to be that of the original aqueous wastestream. Cap material and depth were poorly defined by available data, so a two-foot cap over the landfill area was assumed. Because the model is not very sensitive to the cap parameters, this assumption has little effect on calculated emissions.

Table 4 defines both site specific inputs and default inputs applied to the model. Default values are taken from EPA-450/3-87-026 and reflect defaults and definitions used in the previous study of active TSDFs (MRI, 1987). The model was used to calculate an annual (1985) emissions rate. Sampling data were assumed to represent 1985 emissions. Also, default

TABLE 4. KEY INPUTS TO CLOSED LANDFILL MODEL

Variable	Description	Units	Value
COMPOUND SPECIFIC			
$D_{a,j}$	Diffusivity in air	cm^2/s	Compound specific
$H_{c,j}$	Henry's Law constant	$\text{m}^3\text{atm}/\text{mol}$	Compound specific
C_i	Weight fraction of constituent in waste	---	Wastestream or sample data
X_i	Mole fraction of constituent in waste	---	Wastestream or sample data
MW_i	Molecular weight	$\text{g}/\text{g.mol}$	Compound specific
SITE SPECIFIC			
A	Landfill area	cm^2	Site specific
D	Depth	cm	Site specific or 2,743*
t	Time	months	12 (definition)
l	Cap thickness	cm	Site specific or 107*
DEFAULT/LITERATURE*			
a	Air porosity of cap	---	2.22×10^{-4}
T	Total porosity of cap	---	1.68×10^{-1}
	Density of waste liquid	g/cm^3	1
C_{2i}	Concentration above cap	g/cm^3	0
f_w	Air porosity of fixed waste	---	2.5×10^{-1}
W	Mass of waste liquid in a unit of fixed waste	g/cm^3	1
T	Temperature	$^{\circ}\text{C}$	25

*These values are taken from EPA-450/3-87-026

wastestreams have been applied to 1985. In these two cases, the assumption that these are 1985 data was likely to overestimate emissions due to the fact that many sites have been abandoned for many years. Available analysis principally detected the presence of metals and semi-volatiles; VOCs have probably been emitted to a large extent prior to 1985.

No particulate emissions have been considered due to the closed and capped criteria. The cover material was assumed to be free from contamination above background levels.

Open Dumps/Waste Piles

Few models exist that model emissions from open landfills and waste piles. In this assessment, many of the sites have been used as open dumps or waste piles during their active history. The RTI land treatment model (EPA-450/3-87-026) was selected to estimate VOC emissions. This model was developed for use with open dumps and waste piles for OAQPS. The model was originally applied to active waste disposal processes and assumes diffusion of VOCs from an homogeneously mixed waste in a carrier (i.e., soil). It does not account for biodegradation, but is the only model available for modeling emissions over an extended time period.

Almost certainly, abandoned waste piles are not homogeneously mixed systems. Most have been subject to erosion, biodegradation and volatilization for a significant and usually unknown period. Many of these locations have been the site of spills, general dumping, etc. Frequently, no original constituent analysis or volume are known. For this reason, sampling results have been used for typical characteristics. Again, methods and dates are usually unreported, so sampling data have been assumed to reflect 1985

conditions and be characteristic of the waste as a whole. Table 5 presents both site inputs and default/literature values for key parameters. Once again, default/literature values have been taken from EPA-450/3-87-026. An oily waste has been assumed, as would result from an organic spill.

The model computes both fraction emitted over a defined time period as well as an instantaneous emission rate. For semi-volatile species, the waste reservoir is depleted very slowly; this slow depletion has little effect on calculated emissions over time. Of more concern are the assumption that sampling data are typical and the uncertainty in the estimation of the areal extent of contamination. These parameters were necessary to use the model and values have been based on available information and engineering judgment.

Fugitive particulate emissions (i.e., wind erosion) from dumps and waste piles may be a significant portion of emissions of semi-volatile organics and the only airborne exposure route for metals. These pollutants are estimated as detailed in this chapter. Total emissions are the sum of volatilization and fugitive particulate emissions.

Oily Soil

At sites with apparent organic surface contamination, a method to estimate emissions from this organic layer was used. These sites generally encompassed liquid spill sites and disposal pits where site data indicated an extant oily or organic component on the surface. If an oily component was not

TABLE 5. KEY INPUTS TO OPEN DUMP MODEL

Variable	Description	Units	Value
COMPOUND SPECIFIC			
$D_{a,j}$	Diffusivity in air	cm^2/s	Compound specific
P_j^*	Vapor pressure	atm	Compound specific
C	Weight fraction of	---	Wastestream specific
constituent in	the oil phase		
L	Waste loading (organic)	g/cm^3	Wastestream specific
SITE SPECIFIC			
A	Landfill area	cm^2	Site specific
D	Depth	cm	Site specific or 2,743
t	Time	months	12 (definition)
l	Cap thickness	cm	Site specific or 107
U	Wind speed	m/s	4.6* (Chicago)
T	Temperature	$^{\circ}\text{C}$	25
DEFAULT/LITERATURE ⁺			
a	Density of air	g/cm^3	1.8×10^{-4}
g	Viscosity of air	$\text{g}/\text{cm}/\text{s}$	2.5×10^{-1}
MW _{oil}	Molecular weight of oil	---	147
T	Porosity of fixed waste	---	0.5
a	Air porosity of fixed waste	---	0.25

*These values are taken from EPA-600/8-85-002

⁺These values are taken from EPA-450/3-87-026

indicated or inferred, the waste pile model described above was employed. The model used was developed for liquid hydrocarbon spills and was originally applied to land treatment activities prior to tilling (EPA-450/3-87-026), but is applicable to any oily film. A similar model exists for waste-contaminated surfaces with no oily film, but that model is inappropriate for the longer time scale necessary in this assessment.

Functionally, the model is based on the mass transfer coefficient for an oil film on a surface impoundment. It has been adapted to estimate emissions from waste lying on the soil with a visible oil film. Table 6 lists the site specific inputs and default/literature parameters used to execute the calculations. Again, default/literature values are based on EPA-450/3-87-026. Sampling data were used where available to represent typical 1985 estimates of waste constituents. The possible ramifications of these assumptions are detailed in previous sections. No actual loading data were available and in many cases judgment was used to estimate the extent of contamination.

Disposal Impoundments

There were a few surface impoundments among the abandoned waste sites in the Southeast Chicago area. These systems are former settling or disposal lagoons or pits with no outlet to surface waters. Available impoundment models rely on an estimation of the overall mass transfer coefficient from the liquid surface that accounts for both liquid- and gas-phase resistance. The selection of a particular model is based on an individual system's parameters:

TABLE 6. KEY INPUTS TO THE OILY FILM MODEL

Variable	Description	Units	Value
COMPOUND SPECIFIC			
$D_{a,j}$	Diffusivity in air	cm^2/s	Compound specific
P^*_{*j}	Vapor pressure	atm	Compound specific
H	Henry's Law constant	$\text{cm}^3/\text{g.mol}$	Compound specific
C	Concentration in waste	ppm	Wastestream or sample data
SITE SPECIFIC			
A	Area	m^2	Site specific
t	Time	s	3.2×10^7 (year)
U	Wind speed	m/s	4.6^* (Chicago)
DEFAULT/LITERATURE ⁺			
a	Viscosity of air	$\text{g}/\text{cm.s}$	1.8×10^{-4}
a	Density of air	g/cm^3	1.2×10^{-3}
L	Density of oil	g/cm^3	1
MW_{air}	Molecular weight of air	g/g mol	29
D	Oil film thickness	m	7.2×10^{-2}
MW_{oil}	Molecular weight of oil	g/g mol	282
P_o	Atmospheric pressure	Hg	760

*These values are taken from EPA-600/8-85-002

⁺These values are taken from EPA-450/3-87-026

flowthrough, aerated, activated sludge, or disposal impoundments. A disposal impoundment model for a quiescent surface was selected (EPA-450/3-87-026) because it is designed to simulate an impoundment with no waste inflow or outflow and accounts for decreasing waste concentrations over time. These decreases are due to both volatilization and biodegradation.

This particular model does assume a well-mixed, unstratified system. As a result, emissions are driven by the volatility and concentration of the waste constituents. Model inputs are presented in Table 7 and designated as site specific or default/literature parameters. Default/literature values are based on EPA-450/3-87-026.

In the case of disposal impoundments, available data generally consisted of sampling results. These results were interpreted as typical of an assumed homogenous system in 1985. Variation from this assumption could have a significant impact on emissions, as stratification will significantly affect emissions during a defined time period and serve to bias interpretation of sampling results. VOCs are lost fairly rapidly from a disposal impoundment, so pre-1985 sampling would tend to create an overestimate by these methods. The model provides both the fractional and total organic emissions for the year computed, so knowledge of the sampling data was used to adjust emissions where possible. Because the model is very sensitive to waste constituent concentrations, the lack of accurate records regarding sampling methods impacts the confidence in these estimates. Compounds with negligible vapor pressures would only be emitted due to aerosol entrainment; such processes are considered insignificant and are not modeled.

APPENDIX A

**POTENTIAL ABANDONED
HAZARDOUS WASTE SITES
REVIEWED DURING PROJECT**

LIST OF POTENTIAL ABANDONED
HAZARDOUS WASTE SITES REVIEWED
DURING PROJECT

FCID #	SITE NAME	CITY	COUNTY	LATITUDE	LONGITUDE
ILD980704795	A & B CONTAINER	CHICAGO	COOK	41 49 01.0	087 44 30.0
IND980678585	ABANDONED TANK TRUCKS	GARY	LAKE	41 29 30	087 26 54
ILD069955466	ABEX CORP AMSCO DIV CHICAGO HEIGHTS PLT	CHICAGO HEIGHTS	COOK	41 49 10.0	087 36 53.0
ILD074379546	AMCO INTL INC	CHICAGO	COOK	41 43 20.0	087 36 15.0
IND980679005	ACE WELDING SERV	HAMMOND	LAKE	41 39 30	087 31 00
ILD000716852	ALBURN INC AKA AMERICAN INCINERATION	CHICAGO	COOK	41 40 56.3	087 33 26.3
ILD048300412	ALCO SPRINGS INDUSTRIES	CHICAGO HEIGHTS	COOK	41 28 30.0	087 39 00.0
ILD002981082	ALEXANDER CHEM-DIV OF N AMER CAR (SLA)	LEMONT	COOK	41 41 35.0	087 57 13.0
ILD001833714	ALLIED CORP AKA PVS CHEMICALS INC	CHICAGO	COOK	41 40 20.0	087 33 11.0
ILD066217167	ALS SAND PIT	E. CHICAGO HEIGHTS	COOK	41 30 40.0	087 32
ILD051069854	AMCA INTL	PARK FOREST SOUTH	WILL	41 27 25.0	087 40 40.0
IND143354356	AMERICAN BRICK	MUNSTER	LAKE	41 33 36	087 30 30
IND043354356	AMERICAN BRICK	MUNSTER	LAKE	41 33 36	087 30 30
IND016360265	AMERICAN CHEM SERV INC	GRIFFITH	LAKE	41 31 19	087 24 57
IND005460753	AMERICAN MAIZE	HAMMOND	LAKE	41 41 30	087 31 00
ILD005076443	AMOCO CHEM CORP	WILLOW SPRINGS	COOK	41 42 02.0	087 50 35.0
IND074375585	AMOCO WHITING REF STF & REF	WHITING	LAKE	41 39 50	087 29 55
IND074403296	ANDERSON DEVELOPMENT	GARY	LAKE	41 34 48	087 22 30
ILD000805705	ARMAK CO RESEARCH LAB	MCCOOK	COOK		
ILD982424699	ASBESTOS SHINGLE CO.	RIVERDALE	COOK		
IND980269062	ASHLAND CHEM	HAMMOND	LAKE	41 37 48	087 30 18
ILD980700538	ASHLAND CHEMICAL CO.	WILLOW SPRINGS	COOK	41 44 00.0	087 52 30.0
ILD980704829	ATOMIC DSPL CO	MATTESON	COOK	41 29 43.1	087 41 57.0
ILD981194087	AVE O & 118TH STREET	AVE D S 118TH ST	COOK		
IND064400054	AVERY INTERNATIONAL-THERM AK DIV	SCHERERVILLE	LAKE	41 29 30	087 26 54
ILD980606347	B & O RR CO BARR YARD	RIVERDALE	COOK	41 38 20.0	087 39
IND980679021	BAIRSTOW H CO	HAMMOND	LAKE	41 39 40	087 30 40
ILD180014722	BARKER CHEM CO	CHICAGO	COOK	41 50 43.0	087 39 00.0
ILD005097670	BARKER CHEM CO	CHICAGO	COOK	41 38 50.0	087 36 30.0
ILD064418353	BEAVER OIL & SLUDGE	HODGKINS	COOK	41 46 60.0	087 51 50.0
ILD005229448	BEE CHEM CO	LANSING	COOK	41 36 00.0	087 31 00.0
ILD089828016	BEE COATED FILM CO	CHICAGO HEIGHTS	COOK	41 31 00.0	087 33 30.0
ILD982074650	BENJAMIN MOORE PAINTS	CHICAGO	COOK		
IND980679047	BONGI CARTAGE	GARY	LAKE	41 35 18	087 24 42
	BTL SPECIALTY RESINS	BLUE ISLAND	COOK		
IND074379306	CALLMET COLLEGE AKA AMOCO RESEARCH FAC	HAMMOND	LAKE	41 40 30	087 29 12
ILD980677561	CALLMET HARBOR INDUSTRIAL COMPLEX	CHICAGO	COOK	41 38 45.0	087 33 45.0
IND014387880	CALLMET IND	GARY	LAKE	41 35 18	087 24 42
ILD980903686	CALLMET NU EARTH DIST CENTER	CHICAGO	COOK		
ILD980497713	CALLMET REFINING CO	BURNHAM	COOK		
IND981952872	CANTU FAMILY RESIDENTIAL WELLS	GARY	LAKE	41 35 18	087 24 42
ILD005083332	CARAVELLE WOOD PRODUCTS	SOUTH CHICAGO HEIGHTS	COOK	41 28 45.0	087 38 43.0

LIST OF POTENTIAL ABANDONED
HAZARDOUS WASTE SITES REVIEWED
DURING PROJECT

FCID #	SITE NAME	CITY	COUNTY	LATITUDE	LONGITUDE
ILD112368469	CARGIL CHEM PROD DIV	CHICAGO HEIGHTS	COOK	41 30 20.0	087 32 25.0
ILD980902100	CARLSON LDFL	PALOS HILLS	COOK	41 41 30.0	087 51 16.0
ILD980899769	CARSON MELVIN (SIA)	HOMewood	COOK	41 32 30.0	087 38 45.0
ILD980265797	CARTER WHITE LEAD NL IND	CHICAGO	COOK	41 40 29.0	087 38 29.0
ILD050564277	CHEM PAC SITE	CHICAGO	COOK		
IND010294304	CHEMICAL HAULERS	HAMMOND	LAKE	41 33 36	087 30 30
ILD981959216	CHICAGO CITY OF CYANIDE INCIDENT	CHICAGO	COOK		
ILD981194699	CHICAGO DEPT STREETS & SANITATION	CHICAGO	COOK	41 42	087 35
ILD982071847	CHICAGO DRUMS	CHICAGO	COOK		
IND005230438	CHICAGO FLAME HARDENING CO	GARY	LAKE	41 38 18	087 28 42
ILD980606198	CHICAGO HEIGHTS LDFL	CHICAGO HEIGHTS	COOK	41 30 45.0	087 37
ILD980616460	CHICAGO PLT YARD	CHICAGO	COOK	41 47 45.0	087 46 30.0
ILD981194103	CHICAGO REGIONAL PORT DISTRICT	CHICAGO	COOK		
ILD980678312	CHICAGO SHOT WORKS	CHICAGO	COOK		
ILD982074668	CHICAGO WHITE LEAD	CHICAGO	COOK		
ILD981532823	CTD#2 AND PUG MILL	CHICAGO	COOK		
IND095267381	CITCO PETROLEUM CO	EAST CHICAGO	LAKE	41 38 18	087 28 42
IND980607469	CITIES SERV CO E CHGO REF	EAST CHICAGO	LAKE	41 38 18	087 28 42
ILD980500144	CIZCAR ET AL/VACANT LOT	CALUMET PARK	COOK		
ILD062474598	CLOSED DUMP AT 105TH & HARLEM SW QUAD	PALOS HILLS	COOK		
ILD980497739	COLUMBIA TOOL STEEL CO	CHICAGO HEIGHTS	COOK	41 30 22.0	087 36 58.0
IND016364507	COMMONWEALTH EDISON CO	HAMMOND	LAKE	41 37 48	087 30 18
ILD980606321	COMMONWEALTH EDISON NORTH STA	CHICAGO	COOK		
IND045046810	CONNOR R J INC	GARY	LAKE	41 35 18	087 24 42
IND040888992	CONSERVATION CHEM CO	GARY	LAKE	41 35 18	087 24 42
ILD980497747	COTTAGE GROVE LDFL	CHICAGO	COOK		
ILD005102686	CPC NORTH AMERICA INC BEST FOODS	CHICAGO	COOK	41 50 34.0	087 44 50.0
ILD980677694	CTO & KINGERY DEV CORP	LANSING	COOK	41 34 45.0	087 33 45.0
ILD005450697	CUSTOM ORGANICS INC	CHICAGO	COOK	41 49 00.0	087 39 30.0
ILD980902092	DEBOER LDFL	PALOS HILLS	COOK	41 42 00.0	87 48 00.0
ILD049993165	DESOTO INC	CHICAGO HEIGHTS	COOK	41 30	087 37
ILD982074676	DEVORE & RAYNOLDS	CHICAGO	COOK		
ILD982074684	DIAMOND RED PAINT CO.	CHICAGO	COOK		
ILD072361926	DIAMOND SHAMROCK CORP	CHICAGO	COOK	41 46 25.5	087 43 34.0
ILD981194095	DOLTON MUNI LDFL	DOLTON	COOK	41 37 07.0	087 35 36.5
IND096786884	DOMBROWSKI & HOLMES	HAMMOND	LAKE	41 37 48	087 30 18
IND005174354	DU PONT E I DE NEMOURS & CO	EAST CHICAGO	LAKE	41 38 18	087 28 42
ILD980497804	DUMP IN MARKHAM	MARKHAM	COOK		
ILD087554549	EAGLE TRAILER INC CHIPS	SUMMIT	COOK	41 47 30.0	087 48 45.0
ILD982074692	EAGLE WHITE LEAD	CHICAGO	COOK		
IND980500235	EAST CHICAGO CITY DUMP	EAST CHICAGO	LAKE	41 38 18	087 28 42
IND980500227	EAST CHICAGO SAN DIST	EAST CHICAGO	LAKE	41 38 18	087 28 42
IND082547803	ENERGY COOPERATIVE INC	EAST CHICAGO	LAKE	41 39 01	087 28 54
ILD000666206	ENVIRITE CORP.	HARVEY	COOK		
ILD099213498	ESTECH GENL CHEM CO	CALUMET CITY	COOK		

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FCID #	SITE NAME	CITY	COUNTY	LATITUDE	LONGITUDE
IND005444104	FEDERATED METALS CORP WHITING	HAMMOND	LAKE	41 40 30	087 29 12
ILD025022930	FISHER CALO CHEM CO	CHICAGO	COOK	41 49 50.0	087 39 00.0
IND980679179	FLEXIFLO	HAMMOND	LAKE	41 35 42	087 26 54
ILD005180641	FORD MOTOR CO CHICAGO STAMPING PLT	CHICAGO HEIGHTS	COOK	41 30 20.0	087 36 15.0
ILD982074700	FORT DEARBORN MFG	CHICAGO	COOK		
ILD066205204	FORT MADDEN IND	CHICAGO	COOK	41 46 15.0	087 47 30.0
ILD051067866	FOSECO INC	CHICAGO	COOK	41 41 45.4	087 36 18.0
ILD046170577	FREEMAN UNITED COAL MINING	CHICAGO	COOK		
ILD006931795	FREEMAN UNITED COAL MINING (SIA)	CHICAGO	COOK		
ILD980902068	FRITZ MAR LDFL MUNI #3	CHICAGO HEIGHTS	COOK	41 29	087 37
ILD025359266	GABY IRON & METAL CO	CHICAGO HEIGHTS	COOK	41 29	087 37
IND980500250	GARY CITY LDFL	GARY	LAKE	41 35 18	087 24 42
IND077005916	GARY DEV CO INC	GARY	LAKE	41 36 15	087 25 30
IND067469437	GARY MUNI AIRPORT	GARY	LAKE	41 35 18	087 24 42
ILD980905350	GEMINI LEASING CO INC	HODGKINS	COOK	41 46 40.0	087 51 28.0
IND174429895	GENERAL AMERICAN TRANS CORP	EAST CHICAGO	LAKE	41 38 18	087 28 42
IND016336315	GERERAL DRAINAGE	GARY	LAKE	41 35 18	087 24 42
ILD980606420	GOLDSMITH BROS	CHICAGO	COOK		
ILD980900880	GREAT LAKES LIMITED PARTNERSHIP (SIA)	CHICAGO	COOK		
IND016366213	GRIFFIN WELLPOINT CORP	HAMMOND	LAKE	41 37 48	087 30 18
IND980500284	GRIFFITH LDFL	GRIFFITH	LAKE	41 31 24	087 25 30
ILD005246590	HALL ALUMINUM CO	CHICAGO HEIGHTS	COOK	41 30 5	087 37 5
ILD180010340	HALL C P CO THE	BEDFORD PARK	COOK	41 45 29.0	087 46 08.0
IND000809236	HAMMOND LEAD PROD INC	HAMMOND	LAKE	41 35 50	087 28 12
IND000196469	HAMMOND SEWAGE TRMT	HAMMOND	LAKE	41 39 00	087 30 30
IND005069851	HAMMOND VALVE CORP	HAMMOND	LAKE	41 37 48	087 30 18
ILD980902035	HARRISON PARK	CHICAGO	COOK	41 50 00.0	087 45 00.0
IND981959661	HESSVILLE PARK	HAMMOND	LAKE	41 37 48	087 30 18
ILD000672956	HOBART CHICAGO HEIGHTS INC	CHICAGO HEIGHTS	COOK	41 30 24.8	087 37 06.9
IND077042034	HODGES LLOYD	EAST CHICAGO	LAKE	41 38 18	087 28 42
IND981094071	HOUSE'S JUNK YARD	GARY	LAKE	41 35 18	087 24 42
ILD981193436	HUGHES JIM CONSTR	HICKORY HILLS	COOK	41 43 28.3	087 47 58.0
ILD055398028	HYSAN CORP	BLUE ISLAND	COOK	41 38 30.0	087 41 29.0
IND004387842	Hammond Cold Bar & Steel	Gary	Lake	41 36	087 30
ILD982074718	IL SMELTING-REFINING	CHICAGO	COOK		
IND980500318	ILLIANA TRANSIT CORP	HAMMOND	LAKE	41 33 36	087 30 30
IND042537241	ILLIANA TRANSIT WAREHOUSE CORP	HAMMOND	LAKE	41 37 80	087 30 18
ILD980497986	ILLINOIS BEDFORD PARK CHICAGO ACETYLENE	BEDFORD PARK	COOK	41 46 10.0	087 48 03.0
ILD980606503	ILLINOIS BRICK CO YARD #17	CHICAGO	COOK	41 40 40.0	087 40 00.0
ILD005197892	ILLINOIS BRICK CO YARD #22	BLUE ISLAND	COOK	41 40 30.0	087 40 43.0
ILD980677645	ILLINOIS CENTRAL RR TRACKS	CHICAGO	COOK	41 40 41.3	087 36 52.5
ILD980677652	ILLINOIS WAREHOUSE INC	CHICAGO	COOK	41 49 43.3	087 38 29.6
IND069984276	INDIANA HARBOR BELT RAILROAD	HAMMOND	LAKE	41 33 36	087 30 30
IND980679211	INDUSTRIAL CINDER INC. (Site 77)	GARY	LAKE	41 36	087 20

LIST OF POTENTIAL ABANDONED
HAZARDOUS WASTE SITES REVIEWED
DURING PROJECT

FCID #	SITE NAME	CITY	COUNTY	LATITUDE	LONGITUDE
IND044250587	INDUSTRIAL DSPL CORP	EAST CHICAGO	LAKE	41 37 20	087 26 30
ILD980503213	INLAND METAL REFINING	CHICAGO	COOK	41 40 39.0	087 36 20.0
ILD047907555	INSILOO CORP ENTERPRISE CO DIV	CHICAGO	COOK	41 50 30.0	087 40 00.0
ILD000810432	INTERLAKE PROPERTY W H I	CHICAGO	COOK		
ILD005213285	INTERNATIONAL HARVESTER	CHICAGO	COOK		
ILD097179204	IWI INDUSTRIES WELLOO	SUMMIT	COOK	41 46 49.0	087 48 51.0
IND980500599	J M FOSTER SITE (Site #9)	GARY	LAKE	41 36	087 28
ILD980606339	J P REFUSE DSPL	CHICAGO	COOK		
ILD089071757	J'S MOBILE SEMI TRAILER REPAIR INC	MCCOOK	COOK	41 47 29.0	087 50 30.0
ILD980677678	J-P REFUSE DSPL LIMITED	CHICAGO	COOK	41 46 24.0	087 46 05.0
ILD001799949	JOHNSON & JOHNSON	BEDFORD PARK	COOK	41 46 27.0	087 44 57.0
IND980679229	KEEN CAST (N&A FOUNDRY) #62	GRIFFITH	LAKE	41 31 24	087 25 30
IND005421755	KEIL CHEM	HAMMOND	LAKE	41 37 48	087 30 18
IND042327155	KEN IND INC	HAMMOND	LAKE	41 37 48	087 30 18
ILD005164611	KOPPERS CO INC	STICKNEY	COOK		
ILD022677082	KORHUMEL STEEL CO GARY STEEL SUPPLY DIV	BLUE ISLAND	COOK	41 37 40.0	087 37 40.0
ILD980606362	LAKE CALLUMET QUAD	CHICAGO	COOK	41 40 00.0	087 36 15.0
	LAKE SALVAGE CO.	CHICAGO	COOK		
ILD028710929	LAND & LAKE	DOLTON	COOK	41 38 50.0	087 36 15.0
ILD981531882	LAND & LAKES #2	CHICAGO	COOK	41 38 37.0	087 35 36.5
ILD000672790	LAND AND LAKE #3	CHICAGO	COOK	41 40 57.0	087 34 30.0
ILD100620707	LAURA WARD ELEMENTARY SCHOOL	CHICAGO	COOK		
ILD981000318	LAWDALE AVE NU-EARTH	MCCOOK	COOK		
ILD980902043	LHL #2	CHICAGO	COOK	41 41 00.0	087 34 00.0
ILD980824882	LIQUID DYNAMICS	CHICAGO	COOK		
ILD074410390	LIQUID DYNAMICS	CHICAGO	COOK	41 41 05.8	087 36 11.6
ILD980905285	LIVCO INC CHIPS	CHICAGO RIDGE	COOK	41 42 27.0	087 47 32.0
ILD980902050	LOBUE #2	CHICAGO HEIGHTS	COOK	41 29	087 37
IND095264818	LURIA BROS & CO INC	GARY	LAKE	41 37 35	087 25 10
IND005443825	M & T CHEM INC	EAST CHICAGO	LAKE	41 37 15	087 28 09
	MAGNUS CO., INC.	CHICAGO	COOK		
ILD000666255	MANUFACTURERS BRASS & ALUMINUM FOUNDRY CO	BLUE ISLAND	COOK	41 39 48.3	087 41 35.0
ILD096464466	MARTIN BLUE ISLAND TERM	BLUE ISLAND	COOK	41 39 22.5	087 42 11.25
IND005460209	MASON METAL CO INC	SCHERERVILLE	LAKE	41 29 30	087 26 54
ILD980613913	MCKESSON	DOLTON	COOK		
ILD047029228	MCKESSON CHEM CO	CHICAGO HEIGHTS	COOK	41 31 54.0	087 36 01.0
ILD980677769	METCALF PARK	CHICAGO	COOK	41 49 03.5	087 37 36.6
IND980615421	MIDCO I SITE	GARY	LAKE	41 35 22	087 25 50
IND000606731	MOBIL CHEMICAL CO-PHOSPHO DIV	GARY	LAKE	41 35 30	087 18 45
IND042329631	MOBIL OIL CO E CHGO TERM	EAST CHICAGO	LAKE	41 38 42	087 28 50
ILD000815357	MOBIL OIL CORP CICERO LUBE FLT	CICERO	COOK	41 49 33.0	087 44 23.0
ILD070014774	MOFFETT TECH CTR CPC INTL	ARGO	COOK	47 46 29.0	087 49 50.0
ILD000646786	MOTOR OILS REFINING CO	MCCOOK	COOK	47 48 13.8	087 48 40.0
ILD069506160	MR. FRANK	SOUTH HOLLAND	COOK	41 36 09	087 35 02
IND094761855	MRI CORPE CHICAGO PLANT	EAST CHICAGO	LAKE	41 37 15	087 28 09
ILD980498349	MSD #4 SLUDGE & BARREL DUMP	CHICAGO	COOK		

LIST OF POTENTIAL ABANDONED
HAZARDOUS WASTE SITES REVIEWED
DURING PROJECT

FCID #	SITE NAME	CITY	COUNTY	LATITUDE	LONGITUDE
ILD980677579	MSDGC NEW EARTH HARLEM AVE DUMP	CHICAGO	COOK		
ILD981000326	MSDGC NU-EARTH HARLEM AVE DUMP	MCCOOK	COOK		
IND981959984	MUNSTER DRUM SITE	MUNSTER	LAKE	41 33 36	087 30 30
IND982071789	MUNSTER DRUM SITE	MUNSTER	LAKE	41 33 36	087 30 30
ILD005092572	NALCO CHEM CO	BEDFORD PK	COOK	41 46 24.5	087 46 28.4
ILD980678007	NAME UNREPORTED	CHICAGO	COOK		
ILD982074726	NATIONAL LEAD CO FCTY#13	CHICAGO	COOK		
ILD069506236	NATIONAL SCAVENGER	SOUTH HOLLAND	COOK	41 37 30.0	087 37 30.0
IND980794432	NINTH AVE DUMP	GARY	LAKE	41 35 40	087 25 50
IND980500482	NIPSCO #74	GARY	LAKE	41 38 20	087 24 20
IND980500490	NW IND SITE #88	GARY	LAKE	41 35 18	087 24 42
ILD091766410	OIL & CHEM CO	CALUMET CITY	COOK		
IND980500532	OLD HAMMOND CITY DUMP	HAMMOND	LAKE	41 37 48	087 30 18
ILD981959208	OLD PULLMAN SEWAGE FARM	CHICAGO	COOK	41 39 18.0	087 35 46.0
ILD085343887	ONYX CHEM CO	BLUE ISLAND	COOK	41 38 20.0	087 40 30.0
ILD980677587	PALOS HILLS MSD CAL - SAG SITE	PALOS HILLS	COOK	41 40 37.0	087 46 10.0
ILD070246137	PARKVIEW MOBILE HOME PK	HODGKINS	COOK	41 46 21.0	087 51 03.0
ILD981960404	PAXTON AVENUE LAGOONS	CHICAGO	COOK	41 40 40.0	087 34 07.0
ILD069498186	PAXTON LDFL CORP	CHICAGO	COOK	41 41 00.0	087 34 00.0
INT190010041	PAZMEY CORP ORLAND BARREL & DRUM	GRIFFITH	LAKE	41 31 24	087 25 30
ILD982074767	PEOPLES GAS LIGHT AND COKE (22nd ST)	CHICAGO	COOK		
ILD982074742	PEOPLES GAS/24TH STREET STATION	CHICAGO	COOK		
ILD982074783	PEOPLES GAS/DIVISION STREET STATION	CHICAGO	COOK		
ILD982074775	PEOPLES GAS/NORTH STATION	CHICAGO	COOK		
ILD982074759	PEOPLES GAS/WILLOW STREET STATION	CHICAGO	COOK		
IND000646943	POLLUTION CONTROL IND OF AMERICA	EAST CHICAGO	LAKE	41 38 18	087 28 42
IND981536097	PONDS EAST OF WM POWERS FOREST PRESERVE	HAMMOND	LAKE	41 37 48	087 30 18
IND074390006	POST WAREHOUSE CORP	HAMMOND	LAKE	41 37 48	087 30 18
ILD981195514	POWERS WILLIAM FOREST PRESERVE	CHICAGO	COOK		
ILD981795545	PRAIRIE DEVELOPMENT LTD	CHICAGO	COOK		
IND980608079	PUREX CORP	EAST CHICAGO	LAKE	41 36 55	087 26 00
IND020939856	PY PROD MGMT INC	SCHERERVILLE	LAKE	41 29 45	087 28 13
IND077001808	RALSTON STREET LAGOON	GARY	LAKE	41 36	087 20
ILD982074734	RAYMOND LEAD CO.	CHICAGO	COOK		
ILD980606297	REILLY TAR & CHEM CORP	CHICAGO	COOK	41 50 30.0	087 41 00.0
ILD056623598	REPUBLIC STEEL CHGO DIST	CHICAGO	COOK	41 41 00.0	087 33 00.0
ILD980606206	RESEARCH FARM	FRANKFORT	WILL	41 28 45.0	087 52 30.0
ILD005180070	REYNOLDS METALS CO	MCCOOK	COOK	41 47 50	087 50 21
ILD059446153	RIVERDALE CHEMICAL	CHICAGO HEIGHTS	COOK	41 30 00.0	087 37 30.0
ILD980498265	RIVERDALE PLATING	RIVERDALE	COOK	41 41 30.0	087 37 10.0
ILD982067266	RIVERSIDE LANDFILL	RIVERSIDE	COOK		

LIST OF POTENTIAL ABANDONED
HAZARDOUS WASTE SITES REVIEWED
DURING PROJECT

FCID #	SITE NAME	CITY	COUNTY	LATITUDE	LONGITUDE
ILD980677843	ROADWAY TRUCKING TERMINAL	CHICAGO HEIGHTS	COOK	41 30 30.0	087 34 30.0
ILD005086673	ROUSSELLE CORP	CHICAGO	COOK	41 45 11.3	087 40 36.7
ILD096802160	ROUSSELLE CORP	CHICAGO	COOK	41 45 37.5	087 46 53.0
IND068584432	RUAN TRANSPORT CO	HAMMOND	LAKE	41 36 47	087 27 30
ILD981960859	S. CHICAGO HEIGHTS PUBLIC WELL #2	SOUTH CHICAGO HEIGHTS	COOK		
ILD981960867	S. CHICAGO HEIGHTS PUBLIC WELL #3	SOUTH CHICAGO HEIGHTS	COOK		
ILD980606537	SACRAMENTO PLT	CHICAGO	COOK	41 50 26.7	087 41 41.5
ILD980677876	SALK VILLAGE	SALK VILLAGE	COOK	41 29 35	087 33 40
ILD000672121	SCA CHEM SERV INC ILLINOIS DIV	CHICAGO	COOK	41 40 55.0	087 34 17.0
ILD000606467	SEXTON JOHN HINSDALE LDFL	HINSDALE	COOK	41 50 00.0	087 55 00.0
ILD980606214	SEXTON JOHN LANSING	LANSING	COOK	41 35 20	087 33
ILD980606222	SEXTON JOHN MATTESON	RICHTON PARK	COOK		
IND016371817	SHEFFIELD SCRAP	HAMMOND	LAKE	41 37 48	087 30 18
IND094760444	SHELL OIL CO E CHGO TERM	HAMMOND	LAKE	41 37 48	087 30 18
ILD005456439	SHERWIN WILLIAMS CO	CHICAGO	COOK	41 40 05.8	087 36 02.2
ILD077006443	SINCLAIR & VALENTINE CO INC	CHICAGO	COOK	41 49 07.0	087 43 25.0
IND980500540	SITE #10	GARY	LAKE	41 35 18	087 24 42
IND980679138	SITE #63	GARY	LAKE	41 37 10	087 24 10
IND980500557	SITE #73	GARY	LAKE	41 37 45	087 24 45
ILD980578876	STANDARD T CHEM CO INC RESIN PLT	CHICAGO HEIGHTS	COOK	41 30 20.0	087 32 25.0
ILD180011108	STAUFFER CHEM CHICAGO	CHICAGO	COOK		
ILD005110143	STAUFFER CHEM CO	CHICAGO HEIGHTS	COOK	41 30	087 37 30.0
ILD981952906	STEWART ST. ACID DRUM SITE	CHICAGO	COOK	41 49 31.5	087 38 07.9
IND060370343	SWIFT ADHESIVES & COATINGS	HAMMOND	LAKE	41 3 540	087 28 07
ILD005086087	TAYLOR SPRING MFG CO	CHICAGO	COOK	41 45 00.0	087 37 40.0
ILD001744572	TRIEM STEEL & PROCESSING INC	CHICAGO HEIGHTS	COOK	41 28 50.0	087 38 15.0
IND077001147	UNION CARBIDE CORP E CHGO	EAST CHICAGO	LAKE	41 38 18	087 28 42
IND094738762	UNION CARBIDE CORP LINDE DIV	EAST CHICAGO	LAKE	41 38 05	087 27 50
IND005456058	UNION TANK CAR CO	EAST CHICAGO	LAKE	41 38 18	087 28 42
ILD980606172	UNITED STATES RAILWAY MFG OPER	BLUE ISLAND	COOK		
ILD980679401	US DRUM	CHICAGO	COOK	41 40 42.0	087 33 40.0
ILD981961667	US DRUM II	CHICAGO	COOK		
ILD980679484	US SCRAP	CHICAGO	COOK	41 21 44.0	088 47 11.0
IND047030226	USS LEAD REF INC	EAST CHICAGO	LAKE	41 36 50	087 27 15
IND005444732	VULCAN METALS CORP	GARY	LAKE	41 36 55	087 25 50
IND005084694	WALSH & KELLY ASPHALT CO	GRIFFITH	LAKE	41 31 24	087 25 30
ILD062480959	WELDON IND INC	HARVEY	COOK	41 37 30.0	087 40 30.0
ILD005428651	WEST PULLMAN IRON & METAL	CHICAGO	COOK	41 40 32.0	087 38 29.0
IND980679294	WEST SHORE TRUCKING AKA MOCOW WHSE	HAMMOND	LAKE	41 37 48	087 30 18
IND095258075	WESTERN SCRAP CORP	GARY	LAKE	41 35 18	087 24 42
IND980607014	WHITING PLT OFF SITE LDFL	WHITING	LAKE	41 41 30	087 30 25
IND000198697	WILLET TRUCKING	HAMMOND	LAKE	41 37 48	087 30 18
ILD074405150	WITCO CHEM CORP	CHICAGO	COOK	41 47 53.0	087 46 42.0
IND054101415	WOLF LAKE TERMINALS	HAMMOND	LAKE	41 37 48	087 30 18
ILD005120498	WRIGLEY WM JR CO	CHICAGO	COOK	41 48 40.0	087 39 00.0

APPENDIX C

POTENTIAL SITES REQUIRING ADDITIONAL DATA FOR EMISSIONS ESTIMATION

LIST OF POTENTIAL SITES REQUIRING
ADDITIONAL DATA FOR EMISSIONS ESTIMATION

FCID #	SITE NAME	CITY	COUNTY	LATITUDE	LONGITUDE
IND980678585	ABANDONED TANK TRUCKS	GARY	LAKE	41 29 30	087 26 54
ILD069955466	ABEX CORP AMSCO DIV CHICAGO HEIGHTS PLT	CHICAGO HEIGHTS	COOK	41 49 10.0	087 36 53.0
ILD074379546	ACCO INTL INC	CHICAGO	COOK	41 43 20.0	087 36 15.0
ILD002981082	ALEXANDER CHEM-DIV OF N AMER CAR (SIA)	LEMONT	COOK	41 41 35.0	087 57 13.0
ILD066217167	ALS SAND PIT	E. CHICAGO HEIGHTS	COOK	41 30 40.0	087 32
IND143354356	AMERICAN BRICK	MUNSTER	LAKE	41 33 36	087 30 30
IND043354356	AMERICAN BRICK	MUNSTER	LAKE	41 33 36	087 30 30
IND016360265	AMERICAN CHEM SERV INC	GRIFFITH	LAKE	41 31 19	087 24 57
ILD005076443	AMOCO CHEM CORP	WILLOW SPRINGS	COOK	41 42 02.0	087 50 35.0
IND074375585	AMOCO WHITING REF STF & REF	WHITING	LAKE	41 39 50	087 29 55
ILD000805705	ARMAK CO RESEARCH LAB	MCCOOK	COOK		
ILD982424699	ASBESTOS SHINGLE CO.	RIVERDALE	COOK		
ILD980700538	ASHLAND CHEMICAL CO.	WILLOW SPRINGS	COOK	41 44 00.0	087 52 30.0
IND064400054	AVERY INTERNATIONAL-THERM AK DIV	SCHERERVILLE	LAKE	41 29 30	087 26 54
ILD982074650	BENJAMIN MOORE PAINTS	CHICAGO	COOK		
	BTL SPECIALTY RESINS	BLUE ISLAND	COOK		
ILD980677561	CALUMET HARBOR INDUSTRIAL COMPLEX	CHICAGO	COOK	41 38 45.0	087 33 45.0
ILD980902100	CARLSON LDFL	PALOS HILLS	COOK	41 41 30.0	087 51 16.0
ILD050564277	CHEM PAC SITE	CHICAGO	COOK		
ILD981959216	CHICAGO CITY OF CYANIDE INCIDENT	CHICAGO	COOK		
ILD982071847	CHICAGO DRUMS	CHICAGO	COOK		
ILD980678312	CHICAGO SHOT WORKS	CHICAGO	COOK		
ILD982074668	CHICAGO WHITE LEAD	CHICAGO	COOK		
ILD981532823	CID#2 AND PUG MILL	CHICAGO	COOK		
IND095267381	CITGO PETROLEUM CO	EAST CHICAGO	LAKE	41 38 18	087 28 42
ILD062474598	CLOSED DUMP AT 105TH & HARLEM SW QUAD	PALOS HILLS	COOK		
IND016364507	COMMONWEALTH EDISON CO	HAMMOND	LAKE	41 37 48	087 30 18
ILD980606321	COMMONWEALTH EDISON NORTH STA	CHICAGO	COOK		
IND040888992	CONSERVATION CHEM CO	GARY	LAKE	41 35 18	087 24 42
ILD980497747	COTTAGE GROVE LDFL	CHICAGO	COOK		
ILD005102686	CPC NORTH AMERICA INC BEST FOODS	CHICAGO	COOK	41 50 34.0	087 44 50.0
ILD980677694	CTO & KINGERY DEV CORP	LANSING	COOK	41 34 45.0	087 33 45.0
ILD005450697	CUSTOM ORGANICS INC	CHICAGO	COOK	41 49 00.0	087 39 30.0
ILD980902092	DEBOER LDFL	PALOS HILLS	COOK	41 42 00.0	87 48 00.0
ILD982074676	DEVORE & RAYNOLDS	CHICAGO	COOK		
ILD982074684	DIAMOND RED PAINT CO.	CHICAGO	COOK		
IND005174354	DU PONT E I DE NEMOURS & CO	EAST CHICAGO	LAKE	41 38 18	087 28 42
ILD980497804	DUMP IN MARKHAM	MARKHAM	COOK		
ILD982074692	EAGLE WHITE LEAD	CHICAGO	COOK		
IND082547803	ENERGY COOPERATIVE INC	EAST CHICAGO	LAKE	41 39 01	087 28 54
ILD000666206	ENVIRITE CORP.	HARVEY	COOK		
IND005444104	FEDERATED METALS CORP WHITING	HANNON	LAKE	41 40 30	087 29 12
ILD025022930	FISHER CALO CHEM CO	CHICAGO	COOK	41 49 50.0	087 39 00.0

TABLE 7. KEY INPUTS TO THE DISPOSAL IMPOUNDMENT MODEL

Variable	Description	Units	Value
COMPOUND SPECIFIC			
D_{wj}	Diffusivity in water	cm^2/s	Compound specific
D_{aj}	Diffusivity in air	cm^2/s	Compound specific
H	Henry's Law constant	$\text{m}^3 \text{atm}/\text{g mol}$	Compound specific
C	Concentration	ppm	Wastestream or
SITE SPECIFIC			
A	Area	m^2	Site specific
D	Depth	m	Site specific or
W	Wind speed	m/s	$4.6^{1.8}$ (Chicago)
DEFAULT/LITERATURE ⁺			
D_{ether}	Diffusivity in water (ether)	cm^2/s	8.5×10^{-6}
B	Biodegradation rate (organic)	g/s/g	2.1×10^{-7}
b_i	Biomass concentration	g/m^3	50
T	Temperature	$^{\circ}\text{C}$	25

*These values are taken from EPA-600/8-85-002

⁺These values are taken from EPA-450/3-87-026

Fugitive Particulates

Since many of the compounds of interest (Table 1) are non or semivolatile species, fugitive particulates may represent a relatively significant air exposure route. Fugitive particulate emissions would arise primarily from open dumps/waste piles and spill sites and have only been considered for these sources. Fugitive particulates have been the subject of increasing scrutiny relating to activities such as roads, tilling and active waste piles. This work has targeted anthropogenic sources as the primary source of fugitive particulate emissions. An abandoned site, however, is not prone to the types of disturbances (e.g., truck traffic) or movement and addition of waste materials typical of active sites.

Two equations were considered for assessing these emissions. The first (EPA-600/8-85-002) was developed for use by field personnel making rapid assessment of exposure from surface contamination at hazardous waste sites. The equation considers soil type (particle size), moisture, wind velocity and vegetative cover:

$$E_{10} = 0.036 (1-v)(U/U_t)^3 F(x)$$

where:

E_{10}	=	annual average PM_{10} emission rate per area
V	=	fraction of vegetative cover
U	=	mean annual wind speed
U_t	=	threshold wind speed at 7m
$F(x)$	=	probability distribution of the relation between U_t and U

The equation follows from the empirical relationship that the vertical flux of particles smaller than 10 μm diameter (PM_{10}) is proportional to the cube of wind speed (EPA-600/8-85/002). The equation attempts to estimate

annual emissions of the small, suspended particles (PM_{10}) and uses concentrations of contaminants in the soil to estimate their proportion of total PM_{10} emissions.

The equation relies on specific soil and geographic information available to onsite personnel. Region V and state records do not provide appropriate parameters for soil and topography to use this equation. Although default values could have been developed, the site-specificity implied by the method would not have been realized.

A second method was developed by Evans and Cooper (1980) and has been adapted for use in area source emissions inventories. The equation was initially developed for non-tilled cropland and can be region or county specific:

$$E = AIKCL'V'$$

where: E = total soil loss (annual)
A = suspended fraction
I = soil erodability index
K = roughness factor for terrain
C = climatic factor based on wind speed
and Thornwaite's Precipitation Index
L' = unsheltered field width
V' = vegetative cover factor

Table 8 indicates that the erodability index (directly related to soil type), mean windspeed, and Thornwaite's Precipitation Index (PE) are region or county specific parameters necessary for this method. For southeastern Chicago, the soil erodability index (I) is available from Soil Conservation Service soil surveys for Cook and Lake Counties and mean windspeed and precipitation index (PE) are given as regional parameters in EPA-600/8-85-022. Defaults for the fractional multiplier, roughness factor, and unsheltered

TABLE 8. INPUTS TO THE PARTICULATE EMISSIONS EQUATION

EQUATION: $E = AIKCL'V'$			
Variable	Description	Units	Value
A	Fractional Multiplier to calculate suspended fxn	----	0.025 ^a (2.5%)
I	Erodibility Index on soil class	ton/acre/yr	47 ^b
K	Roughness Factor	----	0.75 ^c
C	Climate Factor	$0.345(U^3/PE^2)$	
U	Mean windspeed @ 10m	mph	10 ^d
PE	Thornwaite's Precipitation Index	----	95 (IL) ^d 108 (IN) ^d
L'	Unsheltered Field factor	----	1 ^a
V'	Vegetative cover factor	----	1 ^a
Area	Site specific (E=tons/acre)	Acres	Site specific

^aEvans and Cooper, JAPCA 30(12): 1298-1303

^bBased on a silty loam as determined from USDA/SCS soil surveys of Cook Co. and Lake Co. Index value is based on EPA-450/3-74-037

^cMidpoint of literature values

^dEPA-600/8-85-022

field width were obtained from typical values reported in the literature (Table 8). Both unsheltered field width and vegetative factor were set equal to 1, assuming a bare, unsheltered site unless specific records indicated otherwise. These assumptions would produce a maximum emissions rate for these two parameters.

The two equations were compared for several likely scenarios in the southeastern Chicago area. Results were within 50 percent for the two methods. Because the Evans and Cooper method relied on generally available, regionally-specific inputs, it was employed. If more detailed site information were available, it is expected that the first method described for rapid assessment personnel would account for site-to-site variation. The equation employed (Evans and Cooper) would yield estimates of greater confidence at larger, more aggregated scales. Conversely, these results may have less confidence when analyzed site by site.

REFERENCES

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2. Midwest Research Institute. Estimation of Hazardous Air Emissions in Southeast Chicago Contributed by TSDFs. Final Report. Prepared for U.S. Environmental Protection Agency. Contract No. 68-02-3891. September 1987.
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4. U.S. Environmental Protection Agency. Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites. Publication No. EPA-600/8-85-002. February 1985.
5. U.S. Department of Agriculture, Soil Conservation Services. Soil Survey of DuPage and Cook Counties, Illinois. 1976.
6. U.S. Department of Agriculture, Soil Conservation Services. Soil Survey of Lake County, Indiana. July 1972.
7. Evans, John S. and Douglas W. Cooper. An Inventory of Particulate Emissions from Open Sources. JAPCA 30(12). December 1980.

APPENDIX B

**POTENTIAL SITES DETERMINED NOT
TO REPRESENT AIR EMISSION SOURCES**

LIST OF POTENTIAL SITES DETERMINED
NOT TO REPRESENT AIR EMISSION SOURCES

FCID #	SITE NAME	CITY	COUNTY	LATITUDE	LONGITUDE
ILD980704795	A & B CONTAINER	CHICAGO	COOK	41 49 01.0	087 44 30.0
IND980679005	ACE WELDING SERV	HAMMOND	LAKE	41 39 30	087 31 00
ILD048300412	ALCO SPRINGS INDUSTRIES	CHICAGO HEIGHTS	COOK	41 28 30.0	087 39 00.0
IND005460753	AMERICAN MAIZE	HAMMOND	LAKE	41 41 30	087 31 00
IND980269062	ASHLAND CHEM	HAMMOND	LAKE	41 37 48	087 30 18
ILD980704829	ATOMIC DSPL CO	MATTESON	COOK	41 29 43.1	087 41 57.0
ILD981194087	AVE O & 118TH STREET	AVE D.S 118TH ST	COOK		
ILD180014722	BARKER CHEM CO	CHICAGO	COOK	41 50 43.0	087 39 00.0
ILD005097670	BARKER CHEM CO	CHICAGO	COOK	41 38 50.0	087 36 30.0
ILD064418353	BEAVER OIL & SLUDGE	HODGKINS	COOK	41 46 60.0	087 51 50.0
ILD005229448	BEE CHEM CO	LANSING	COOK	41 36 00.0	087 31 00.0
ILD089828016	BEE COATED FILM CO	CHICAGO HEIGHTS	COOK	41 31 00.0	087 33 30.0
ILD980903686	CALLMET NU EARTH DIST CENTER	CHICAGO	COOK		
ILD980497713	CALLMET REFINING CO	BURNHAM	COOK		
IND981952872	CANTU FAMILY RESIDENTIAL WELLS	GARY	LAKE	41 35 18	087 24 42
ILD005083332	CARAVELLE WOOD PRODUCTS	SOUTH CHICAGO HEIGHTS	COOK	41 28 45.0	087 38 43.0
ILD112368469	CARTIL CHEM PROD DIV	CHICAGO HEIGHTS	COOK	41 30 20.0	087 32 25.0
ILD980899769	CARSON MELVIN (SLA)	HOMEWOOD	COOK	41 32 30.0	087 38 45.0
ILD980265797	CARTER WHITE LEAD NL IND	CHICAGO	COOK	41 40 29.0	087 38 29.0
IND010294304	CHEMICAL HAULERS	HAMMOND	LAKE	41 33 36	087 30 30
IND005230438	CHICAGO FLAME HARDENING CO	GARY	LAKE	41 38 18	087 28 42
ILD980606198	CHICAGO HEIGHTS LDFL	CHICAGO HEIGHTS	COOK	41 30 45.0	087 37
ILD981194103	CHICAGO REGIONAL PORT DISTRICT	CHICAGO	COOK		
ILD980500144	CIZCAR ET AL/VACANT LOT	CALLMET PARK	COOK		
ILD980497739	COLUMBIA TOOL STEEL CO	CHICAGO HEIGHTS	COOK	41 30 22.0	087 36 58.0
IND045046810	CONNOR R J INC	GARY	LAKE	41 35 18	087 24 42
ILD049993165	DESOTO INC	CHICAGO HEIGHTS	COOK	41 30	087 37
ILD072361926	DIAMOND SHAMROCK CORP	CHICAGO	COOK	41 46 25.5	087 43 34.0
ILD981194095	DOLTON MUNI LDFL	DOLTON	COOK	41 37 07.0	087 35 36.5
ILD087554549	EAGLE TRAILER INC CHIPS	SUMMIT	COOK	41 47 30.0	087 48 45.0
IND980500235	EAST CHICAGO CITY DUMP	EAST CHICAGO	LAKE	41 38 18	087 28 42
IND980500227	EAST CHICAGO SAN DIST	EAST CHICAGO	LAKE	41 38 18	087 28 42
ILD051067866	FOSECO INC	CHICAGO	COOK	41 41 45.4	087 36 18.0
ILD980902068	FRITZ MAR LDFL MUNI #3	CHICAGO HEIGHTS	COOK	41 29	087 37
ILD025359266	GABY IRON & METAL CO	CHICAGO HEIGHTS	COOK	41 29	087 37
ILD980905350	GEMINI LEASING CO INC	HODGKINS	COOK	41 46 40.0	087 51 28.0
IND016366213	GRIFFIN WELLPOINT CORP	HAMMOND	LAKE	41 37 48	087 30 18
ILD180010340	HALL C P CO THE	BEDFORD PARK	COOK	41 45 29.0	087 46 08.0
IND000809236	HAMMOND LEAD PROD INC	HAMMOND	LAKE	41 35 50	087 28 12
IND000196469	HAMMOND SEWAGE TRMT	HAMMOND	LAKE	41 39 00	087 30 30
ILD980902035	HARRISON PARK	CHICAGO	COOK	41 50 00.0	087 45 00.0
ILD000672956	HOBART CHICAGO HEIGHTS INC	CHICAGO HEIGHTS	COOK	41 30 24.8	087 37 06.9
ILD981193436	HUGHES JIM CONSTR	HICKORY HILLS	COOK	41 43 28.3	087 47 58.0
ILD055398028	HYSAN CORP	BLUE ISLAND	COOK	41 38 30.0	087 41 29.0
ILD980497986	ILLINOIS BEDFORD PARK CHICAGO	BEDFORD PARK	COOK	41 46 10.0	087 48 03.0
	ACETYLENE				
ILD980606503	ILLINOIS BRICK CO YARD #17	CHICAGO	COOK	41 40 40.0	087 40 00.0
ILD005197892	ILLINOIS BRICK CO YARD #22	BLUE ISLAND	COOK	41 40 30.0	087 40 43.0
ILD980677645	ILLINOIS CENTRAL RR TRACKS	CHICAGO	COOK	41 40 41.3	087 36 52.5
ILD980677652	ILLINOIS WAREHOUSE INC	CHICAGO	COOK	41 49 43.3	087 38 29.6

LIST OF POTENTIAL SITES DETERMINED
NOT TO REPRESENT AIR EMISSION SOURCES

FCID #	SITE NAME	CITY	COUNTY	LATITUDE	LONGITUDE
ILD047907555	INSILOO CORP ENTERPRISE CO DIV	CHICAGO	COOK	41 50 30.0	087 40 00.0
ILD097179204	IWI INDUSTRIES WELCO	SUMMIT	COOK	41 46 49.0	087 48 51.0
ILD089071757	J'S MOBILE SEMI TRAILER REPAIR INC	MCCOOK	COOK	41 47 29.0	087 50 30.0
ILD980677678	J-P REFUSE DSPL LIMITED	CHICAGO	COOK	41 46 24.0	087 46 05.0
ILD022677082	KORHUMEL STEEL CO GARY STEEL SUPPLY DIV	BLUE ISLAND	COOK	41 37 40.0	087 37 40.0
ILD028710929	LAND & LAKE	DOLTON	COOK	41 38 50.0	087 36 15.0
ILD980902043	LHL #2	CHICAGO	COOK	41 41 00.0	087 34 00.0
ILD980905285	LIVCO INC CHIPS	CHICAGO RIDGE	COOK	41 42 27.0	087 47 32.0
IND005443825	M & T CHEM INC	EAST CHICAGO	LAKE	41 37 15	087 28 09
ILD047029228	MCKESSON CHEM CO	CHICAGO HEIGHTS	COOK	41 31 54.0	087 36 01.0
ILD980677769	METCALF PARK	CHICAGO	COOK	41 49 03.5	087 37 36.6
ILD000815357	MOBIL OIL CORP CIGERO LUBE PLT	CIGERO	COOK	41 49 33.0	087 44 23.0
ILD070014774	MOFFETT TECH CTR CPC INTL	ARGO	COOK	47 46 29.0	087 49 50.0
ILD069506160	MR. FRANK	SOUTH HOLLAND	COOK	41 36 09	087 35 02
ILD005092572	NALCO CHEM CO	BEDFORD PK	COOK	41 46 24.5	087 46 28.4
ILD069506236	NATIONAL SCAVENGER	SOUTH HOLLAND	COOK	41 37 30.0	087 37 30.0
IND980794432	NINTH AVE DUMP	GARY	LAKE	41 35 40	087 25 50
IND980500490	NW IND SITE #88	GARY	LAKE	41 35 18	087 24 42
ILD091766410	OIL & CHEM CO	CALLMET CITY	COOK		
ILD980677587	PALOS HILLS MSD CAL - SAG SITE	PALOS HILLS	COOK	41 40 37.0	087 46 10.0
IND981536097	PONDS EAST OF WM POWERS FOREST PRESERVE	HAMMOND	LAKE	41 37 48	087 30 18
IND074390006	POST WAREHOUSE CORP	HAMMOND	LAKE	41 37 48	087 30 18
IND980608079	PUREX CORP	EAST CHICAGO	LAKE	41 36 55	087 26 00
ILD056623598	REPUBLIC STEEL CHGO DIST	CHICAGO	COOK	41 41 00.0	087 33 00.0
ILD980606206	RESEARCH FARM	FRANKFORT	WILL	41 28 45.0	087 52 30.0
ILD980498265	RIVERDALE PLATING	RIVERDALE	COOK	41 41 30.0	087 37 10.0
ILD980677876	SALK VILLAGE	SALK VILLAGE	COOK	41 29 35	087 33 40
ILD000606467	SEXTON JOHN HINSDALE LDFL	HINSDALE	COOK	41 50 00.0	087 55 00.0
IND016371817	SHEFFIELD SCRAP	HAMMOND	LAKE	41 37 48	087 30 18
ILD005456439	SHERWIN WILLIAMS CO	CHICAGO	COOK	41 40 05.8	087 36 02.2
ILD077006443	SINCLAIR & VALENTINE CO INC	CHICAGO	COOK	41 49 07.0	087 43 25.0
ILD005110143	STAUFFER CHEM CO	CHICAGO HEIGHTS	COOK	41 30	087 37 30.0
ILD981952906	STEWART ST. ACID DRUM SITE	CHICAGO	COOK	41 49 31.5	087 38 07.9
ILD005086087	TAYLOR SPRING MFG CO	CHICAGO	COOK	41 45 00.0	087 37 40.0
IND077001147	UNION CARBIDE CORP E CHGO	EAST CHICAGO	LAKE	41 38 18	087 28 42
IND094738762	UNION CARBIDE CORP LINDE DIV	EAST CHICAGO	LAKE	41 38 05	087 27 50
IND047030226	USS LEAD REF INC	EAST CHICAGO	LAKE	41 36 50	087 27 15
ILD062480959	WELDON IND INC	HARVEY	COOK	41 37 30.0	087 40 30.0
ILD005428651	WEST PULLMAN IRON & METAL	CHICAGO	COOK	41 40 32.0	087 38 29.0
ILD074405150	WITCO CHEM CORP	CHICAGO	COOK	41 47 53.0	087 46 42.0
ILD005120498	WRIGLEY WM JR CO	CHICAGO	COOK	41 48 40.0	087 39 00.0

LIST OF POTENTIAL SITES REQUIRING
ADDITIONAL DATA FOR EMISSIONS ESTIMATION

FCID #	SITE NAME	CITY	COUNTY	LATITUDE	LONGITUDE
ILD005180641	FORD MOTOR CO CHICAGO STAMPING PLT	CHICAGO HEIGHTS	COOK	41 30 20.0	087 36 15.0
ILD982074700	FORT DEARBORN MFG	CHICAGO	COOK		
ILD066205204	FORT MADDEN IND	CHICAGO	COOK	41 46 15.0	087 47 30.0
ILD046170577	FREEMAN UNITED COAL MINING	CHICAGO	COOK		
ILD006931795	FREEMAN UNITED COAL MINING (SIA)	CHICAGO	COOK		
IND980500250	GARY CITY LDFL	GARY	LAKE	41 35 18	087 24 42
IND077005916	GARY DEV CO INC	GARY	LAKE	41 36 15	087 25 30
IND067469437	GARY MUNI AIRPORT	GARY	LAKE	41 35 18	087 24 42
IND174429895	GENERAL AMERICAN TRANS CORP	EAST CHICAGO	LAKE	41 38 18	087 28 42
IND016336315	GERERAL DRAINAGE	GARY	LAKE	41 35 18	087 24 42
ILD980606420	COLD SMITH BROS	CHICAGO	COOK		
ILD980900880	GREAT LAKES LIMITED PARTNERSHIP (SIA)	CHICAGO	COOK		
IND980500284	GRIFFITH LDFL	GRIFFITH	LAKE	41 31 24	087 25 30
IND005069851	HAMMOND VALVE CORP	HAMMOND	LAKE	41 37 48	087 30 18
IND981959661	HESSVILLE PARK	HAMMOND	LAKE	41 37 48	087 30 18
IND077042034	HODGES LLOYD	EAST CHICAGO	LAKE	41 38 18	087 28 42
ILD982074718	IL SMELTING-REFINING	CHICAGO	COOK		
IND042537241	ILLIANA TRANSIT WAREHOUSE CORP	HAMMOND	LAKE	41 37 80	087 30 18
IND044250587	INDUSTRIAL DSPL CORP	EAST CHICAGO	LAKE	41 37 20	087 26 30
ILD980503213	INLAND METAL REFINING	CHICAGO	COOK	41 40 39.0	087 36 20.0
ILD980606339	J P REFUSE DSPL	CHICAGO	COOK		
ILD001799949	JOHNSON & JOHNSON	BEDFORD PARK	COOK	41 46 27.0	087 44 57.0
IND980679229	KEEN CAST (N&A FOUNDRY) #62	GRIFFITH	LAKE	41 31 24	087 25 30
IND042327155	KEN IND INC	HAMMOND	LAKE	41 37 48	087 30 18
ILD005164611	KOPPERS CO INC	STICKNEY	COOK		
ILD980606362	LAKE CALLUMET QUAD	CHICAGO	COOK	41 40 00.0	087 36 15.0
	LAKE SALVAGE CO.	CHICAGO	COOK		
ILD100620707	LAURA WARD ELEMENTARY SCHOOL	CHICAGO	COOK		
ILD981000318	LAWDALE AVE NU-EARTH	MCCOOK	COOK		
ILD980824882	LIQUID DYNAMICS	CHICAGO	COOK		
ILD074410390	LIQUID DYNAMICS	CHICAGO	COOK	41 41 05.8	087 36 11.6
	MAGNUS CO., INC.	CHICAGO	COOK		
ILD000666255	MANUFACTURERS BRASS & ALUMINUM FOUNDRY CO	BLUE ISLAND	COOK	41 39 48.3	087 41 35.0
ILD096464466	MARTIN BLUE ISLAND TERM	BLUE ISLAND	COOK	41 39 22.5	087 42 11.25
IND005460209	MASON METAL CO INC	SCHERERVILLE	LAKE	41 29 30	087 26 54
ILD980613913	MCKESSON	DOLTON	COOK		
IND980615421	MIDCO I SITE	GARY	LAKE	41 35 22	087 25 50
IND094761855	MRI CORPE CHICAGO PLANT	EAST CHICAGO	LAKE	41 37 15	087 28 09
ILD980677579	MSDGC NEW EARTH HARLEM AVE DUMP	CHICAGO	COOK		
ILD981000326	MSDGC NU-EARTH HARLEM AVE DUMP	MCCOOK	COOK		
IND981959984	MUNSTER DRUM SITE	MUNSTER	LAKE	41 33 36	087 30 30
IND982071789	MUNSTER DRUM SITE	MUNSTER	LAKE	41 33 36	087 30 30
ILD982074726	NATIONAL LEAD CO FCTY#13	CHICAGO	COOK		
IND980500532	OLD HAMMOND CITY DUMP	HAMMOND	LAKE	41 37 48	087 30 18
ILD085343887	ONYX CHEM CO	BLUE ISLAND	COOK	41 38 20.0	087 40 30.0

LIST OF POTENTIAL SITES REQUIRING
ADDITIONAL DATA FOR EMISSIONS ESTIMATION

FCID #	SITE NAME	CITY	COUNTY	LATITUDE	LONGITUDE
ILD070246137	PARKVIEW MOBILE HOME PK	HODGKINS	COOK	41 46 21.0	087 51 03.0
ILD981960404	PAXTON AVENUE LAGOONS	CHICAGO	COOK	41 40 40.0	087 34 07.0
ILD069498186	PAXTON LDFL CORP	CHICAGO	COOK	41 41 00.0	087 34 00.0
INT190010041	PAZMEY CORP ORLAND BARREL & DRUM	GRIFFITH	LAKE	41 31 24	087 25 30
ILD982074767	PEOPLES GAS LIGHT AND COKE (22nd ST)	CHICAGO	COOK		
ILD982074742	PEOPLES GAS/24TH STREET STATION	CHICAGO	COOK		
ILD982074783	PEOPLES GAS/DIVISION STREET STATION	CHICAGO	COOK		
ILD982074775	PEOPLES GAS/NORTH STATION	CHICAGO	COOK		
ILD982074759	PEOPLES GAS/WILLOW STREET STATION	CHICAGO	COOK		
IND000646943	POLLUTION CONTROL IND OF AMERICA	EAST CHICAGO	LAKE	41 38 18	087 28 42
ILD981195514	POWERS WILLIAM FOREST PRESERVE	CHICAGO	COOK		
ILD981795545	PRAIRIE DEVELOPMENT LTD	CHICAGO	COOK		
IND020939856	PY PROD MGMT INC	SCHERERVILLE	LAKE	41 29 45	087 28 13
ILD982074734	RAYMOND LEAD CO.	CHICAGO	COOK		
ILD980606297	REILLY TAR & CHEM CORP	CHICAGO	COOK	41 50 30.0	087 41 00.0
ILD005180070	REYNOLDS METALS CO	MCCOOK	COOK	41 47 50	087 50 21
ILD982067266	RIVERSIDE LANDFILL	RIVERSIDE	COOK		
ILD980677843	ROADWAY TRUCKING TERMINAL	CHICAGO HEIGHTS	COOK	41 30 30.0	087 34 30.0
ILD096802160	ROUSSELLE CORP	CHICAGO	COOK	41 45 37.5	087 46 53.0
IND068584432	RUAN TRANSPORT CO	HAMMOND	LAKE	41 36 47	087 27 30
ILD981960859	S. CHICAGO HEIGHTS PUBLIC WELL #2	SOUTH CHICAGO HEIGHTS	COOK		
ILD981960867	S. CHICAGO HEIGHTS PUBLIC WELL #3	SOUTH CHICAGO HEIGHTS	COOK		
ILD980606537	SACRAMENTO PLT	CHICAGO	COOK	41 50 26.7	087 41 41.5
ILD000672121	SCA CHEM SERV INC ILLINOIS DIV	CHICAGO	COOK	41 40 55.0	087 34 17.0
ILD980606214	SEXTON JOHN LANSING	LANSING	COOK	41 35 20	087 33
ILD980606222	SEXTON JOHN MATTESON	RIGHTON PARK	COOK		
IND094760444	SHELL OIL CO E CHOO TERM	HAMMOND	LAKE	41 37 48	087 30 18
IND980500540	SITE #10	GARY	LAKE	41 35 18	087 24 42
IND980679138	SITE #63	GARY	LAKE	41 37 10	087 24 10
IND980500557	SITE #73	GARY	LAKE	41 37 45	087 24 45
ILD980578876	STANDARD T CHEM CO INC RESIN PLT	CHICAGO HEIGHTS	COOK	41 30 20.0	087 32 25.0
ILD180011108	STAUFFER CHEM CHICAGO	CHICAGO	COOK		
IND005456058	UNION TANK CAR CO	EAST CHICAGO	LAKE	41 38 18	087 28 42
ILD980606172	UNITED STATES RAILWAY MFG OPER	BLUE ISLAND	COOK		
ILD980679401	US DRUM	CHICAGO	COOK	41 40 42.0	087 33 40.0
ILD981961667	US DRUM II	CHICAGO	COOK		
ILD980679484	US SCRAP	CHICAGO	COOK	41 21 44.0	088 47 11.0
IND005084694	WALSH & KELLY ASPHALT CO	GRIFFITH	LAKE	41 31 24	087 25 30
IND980679294	WEST SHORE TRUCKING AKA MCCAW WHSE	HAMMOND	LAKE	41 37 48	087 30 18
IND095258075	WESTERN SCRAP CORP	GARY	LAKE	41 35 18	087 24 42

LIST OF POTENTIAL SITES REQUIRING
ADDITIONAL DATA FOR EMISSIONS ESTIMATION

FCID #	SITE NAME	CITY	COUNTY	LATITUDE	LONGITUDE
IND980607014	WHITING PLT OFF SITE LDFL	WHITING	LAKE	41 41 30	087 30 25
IND000198697	WILLET TRUCKING	HAMMOND	LAKE	41 37 48	087 30 18

APPENDIX D

**MODEL INPUTS FOR ABANDONED
HAZARDOUS WASTE SITE EMISSION ESTIMATION**

TABLE D-1. DATA INPUTS USED TO ESTIMATE EMISSIONS FROM LANDFILLS

FCID	SITENAME	COMPOUND	D _{ai} (cmE2/sec)	H _{ci} (mE3*atm/mol)	C _i	X _i	MW _i (g/g*mol)	Area (cmE2)	Depth (cm)	t (mo)	EMISSIONS tons/year
ILD000810432	INTERLAKE LF +COKE	PNaphthalene	0.059	0.00118	0.15	2.11E-08	128.19	5.7E+09	457	12	1.76E-03
		Benzene	0.088	0.0055	0.0001	2.30E-11	78.12	5.7E+09	457	12	9.03E-06
		Toluene	0.087	0.00668	0.0001	1.95E-11	92.15	5.7E+09	457	12	9.29E-06
ILD099213498	ESTECH CHEMICAL	Parathion		0.000048	0.03	1.85E-09	291.27	40000000	120	12	1.15E-08
		Chlordane		0.0000367	0.03	1.32E-09	409.8	40000000	120	12	6.27E-09

D-2

TABLE D-2. DATA INPUTS USED TO ESTIMATE EMISSIONS FROM WASTE PILES/OPEN DUMPS

FCID	SITENAME	COMPOUND	D _(air) (cm ² /s)	P* (atm)	C (wt fxn)	L (waste fxn)	Area (m ²)	l (depth) (cm)	t (s)	EMISSIONS (m tpy)
ILD001744572	TRIEM STEEL	Naphthalene	5.9E-02	7.5E-06	1.5E-01	1.0E+00	4.0E+03	3.1E+02	3.2E+07	9.6E-02
ILD005086673	ROUSSELLE CORP	Toluene	8.7E-02	8.6E-06	1.0E-02	1.0E+00	4.0E+03	1.2E+02	3.2E+07	8.4E-03

TABLE D-3. DATA INPUTS USED TO ESTIMATE EMISSIONS FROM OILY SOIL

FCID	SITENAME	COMPOUND	D(air)	P*	H	C (ppm)	Area (m ²)	t (s)	EMISSIONS (tpy)
IND074379306	AMOCO RESEARCH	Benz(a)pyrene	1.3E-09	5.7E-04	4.3E-02	3.2E+00	2.0E+04	3.2E+07	5.5E-10
		Phenanthrene	0.0E+00	2.1E-04	6.1E-03	3.5E+00	2.0E+04	3.2E+07	
		Arochlor-1254	0.0E+00	8.0E-05	3.0E-04	1.7E-02	2.0E+04	3.2E+07	
		Hexachlorobenzene	5.9E-06	1.0E+00	6.8E-04	6.4E+00	2.0E+04	3.2E+07	5.5E-04
IND980679021	BAIRSTOW CO.	Phenanthrene	0.0E+00	0.0E+00	6.1E-03	2.1E+01	4.0E+02	3.2E+07	
		Fluoranthene	0.0E+00	0.0E+00	6.7E-02	4.1E+01	4.0E+02	3.2E+07	
		Pyrene	0.0E+00	0.0E+00	7.0E-09	5.1E+01	4.0E+02	3.2E+07	
		Benzo(a)fluoranthene	0.0E+00	0.0E+00	2.0E-05	5.6E+01	4.0E+02	3.2E+07	
		Benzo (a) pyrene	4.3E-02	9.0E-06	1.4E-09	3.9E+01	4.0E+02	3.2E+07	2.9E-07
		Indenopyrene	0.0E+00	0.0E+00	5.1E-13	3.7E+01	4.0E+02	3.2E+07	
		Benzoperylene				3.9E+01	4.0E+02	3.2E+07	
IND980679179	FLEXIFLO	Benzoanthracene	5.1E-02	9.0E-06	1.4E-09	2.1E+01	4.0E+02	3.2E+07	1.7E-07
		Pyrene	0.0E+00	0.0E+00	7.0E-09	4.5E+01	4.0E+02	3.2E+07	
		1,2-dichloroethylene				4.5E+01	4.0E+02	3.2E+07	
		Trichloroethylene	7.9E-02	9.1E-06	9.1E-03	7.9E+00	4.0E+02	3.2E+07	9.0E-08
IND980607469	Cities Services	PHENANTHRENE	0.0E+00	2.1E-04	6.1E-03	4.2E+01	2.0E+04	3.2E+07	
		FLUORANTHENE		1.8E-02	6.7E-02	4.5E+01	2.0E+04	3.2E+07	
		PYRENE	0.0E+00	4.2E-09	7.0E-09	4.4E+01	2.0E+04	3.2E+07	
		BENZO(A)ANTHRACEN	5.1E-02	1.5E-07	1.4E-09	1.2E+02	2.0E+04	3.2E+07	6.8E-07
		CHRYSENE		5.8E-10	1.2E-09	2.0E+02	2.0E+04	3.2E+07	
		BENZO(A)PYRENE	4.3E-02	5.6E-04	1.4E-09	5.9E+01	2.0E+04	3.2E+07	1.1E-03
		2-METHYLNAPHTHALENE		8.3E-03	5.8E-05	6.7E+01	2.0E+04	3.2E+07	
IND054101415	WOLF LAKE TERM.	Trichloroethylene	7.9E-02	9.1E-06	9.1E-03	4.0E+01	4.0E+02	3.2E+07	4.5E-07
IND981094071	HOUSE'S J-YARD	Chloroform	1.0E-01	1.0E-05	3.4E-03	3.9E+01	8.0E+03	3.2E+07	9.9E-06
		2-methylnaphthalene				6.6E+02	8.0E+03	3.2E+07	
		Phenanthrene	0.0E+00	0.0E+00	6.1E-03	1.4E+03	8.0E+03	3.2E+07	
		Pyrene	0.0E+00	0.0E+00	7.0E-09	2.1E+03	8.0E+03	3.2E+07	
ILD000646786	MORECO	Benzo(A)anthracene	5.1E-02	9.0E-06	1.4E-09	4.0E+04	2.0E+02	3.2E+07	1.7E-04
		Benzo(A)pyrene	4.3E-02	9.0E-06	1.4E-09	1.0E+04	2.0E+02	3.2E+07	3.9E-05
ILD051069854	AMCA Intl	PCB's			4.8E-05	2.6E+03	4.0E+03	3.2E+07	
ILD059446153	RIVERDALE CHEM	Dioxin	2.3E-01	1.0E-05	2.3E-05	1.1E-03	2.0E+04	3.2E+07	1.1E-09
ILD980606347	B+O RR-BARR YARD	Acrylonitrile	1.2E-01	1.3E-05	8.8E-05	1.0E+01	2.8E+02	3.2E+07	1.6E-07
		Pentachlorophenol	5.6E-02	6.1E-06	2.8E-06	7.8E+02	1.2E+03	3.2E+07	1.3E-05
ILD980616460	CHICAGO PLT YARD	Toluene	8.7E-02	8.6E-06	6.7E-03	8.0E+05	1.0E+01	3.2E+07	2.8E-04
ILD980902050	LOBUE #2	Toluene	8.7E-02	8.6E-06	6.7E-03	1.0E+04	4.0E+03	3.2E+07	1.0E-03

TABLE D-4. DATA INPUTS USED TO ESTIMATE EMISSIONS FROM DISPOSAL IMPOUNDMENTS

FCID	SITENAME	COMPOUND	D(water)	D(air)	H	Co (ppm)	Area (m ²)	Depth (m)	t (s)	EMISSIONS (tpy)
IND042329631	MOBIL OIL-N. PIT	XYLENE	7.8E-06	7.0E-02	5.3E-03	1.8E+04	3.7E+02	6.1E+00	3.2E+07	4.5E+01
		TOLUENE	8.6E-06	8.7E-03	6.8E-03	3.0E+03	3.7E+02	6.1E+00	3.2E+07	7.4E+00
		ETHYL BENZENE	7.8E-06	7.5E-02	6.4E-03	3.0E+03	3.7E+02	6.1E+00	3.2E+07	7.4E+00
	MOBIL OIL-CNT. PIT	XYLENE	7.8E-06	7.0E-02	5.3E-03	9.0E+02	3.7E+02	6.1E+00	3.2E+07	2.2E+00
		ETHYL BENZENE	7.8E-06	7.5E-02	6.4E-03	1.1E+03	3.7E+02	6.1E+00	3.2E+07	2.7E+00
	MOBIL OIL-S. PIT	XYLENE	7.8E-06	7.0E-02	5.3E-03	3.0E+03	3.7E+02	6.1E+00	3.2E+07	7.4E+00
		TOLUENE	8.6E-06	8.7E-03	6.8E-03	1.1E+02	3.7E+02	6.1E+00	3.2E+07	2.5E-01
		ETHYL BENZENE	7.8E-06	7.5E-02	6.4E-03	9.8E+02	3.7E+02	6.1E+00	3.2E+07	2.4E+00
	IND077009808 RALSTON ST. LAGOON	PCB	0.00E+00	0.0E+00	3.0E-04	1.2E+03	4.8E+04	1.8E+00	3.2E+07	

TABLE D-5. DATA INPUTS USED TO ESTIMATE FUGITIVE PARTICULATE EMISSIONS

FCID	SITENAME	COMPOUND	C (ppm)	Area (Acre)	Emissions (Tons/Ac*Yr)	Emissions (m tons/yr)
IND074403296	ANDERSON DEV.	Styrene	2.30E+00	1.00E-01	1.09E-07	9.9E-09
		Bis-2-ethylhexylphth	1.36E+01	1.00E-01	6.47E-07	5.9E-08
		Benzofluoranthene	1.84E+03	1.00E-01	8.75E-05	8.0E-06
		As	1.80E+01	1.00E-01	8.56E-07	7.8E-08
		Be	3.90E+00	1.00E-01	1.85E-07	1.7E-08
		Cd	2.10E+01	1.00E-01	9.99E-07	9.1E-08
		Cr	4.50E+01	1.00E-01	2.14E-06	1.9E-07
		Hg	3.00E-01	1.00E-01	1.43E-08	1.3E-09
		CN	6.10E+00	1.00E-01	2.90E-07	2.6E-08
IND000606731	MOBIL CHEM/P-DIV	Toluene	1.50E+01	2.00E+00	7.13E-07	1.3E-06
		Xylene	1.60E+02	2.00E+00	7.61E-06	1.4E-05
		1,2-dichlorobenzine	1.10E+01	2.00E+00	5.23E-07	9.5E-07
		Nophthalene	2.00E+01	2.00E+00	9.51E-07	1.7E-06
		2-methylnaphthalene	1.00E+01	2.00E+00	4.75E-07	8.6E-07
		PCP	5.50E+01	2.00E+00	2.62E-06	4.8E-06
		Diocetylphthalate	1.00E+02	2.00E+00	4.75E-06	8.6E-06
		Hg	7.00E+00	2.00E+00	3.33E-07	6.1E-07
		Cd	3.70E+00	2.00E+00	1.76E-07	3.2E-07
IND005444732	VULCAN MATS.	Pb	6.30E+00	5.60E-01	3.00E-07	1.5E-07
		Cr	1.90E-01	5.60E-01	9.03E-09	4.6E-09
		As	1.00E-02	5.60E-01	4.75E-10	2.4E-10
		Hg	1.20E-02	5.60E-01	5.71E-10	2.9E-10
		Ba	1.30E+00	5.60E-01	6.18E-08	3.1E-08
IND980679021	BAIRSTOW CO.	Phenanthrene	2.10E+01	1.00E+02	9.99E-07	9.1E-05
		Fluoranthene	4.10E+01	1.00E+02	1.95E-06	1.8E-04
		Pyrene	5.10E+01	1.00E+02	2.42E-06	2.2E-04
		Benzofluoranthene	5.60E+01	1.00E+02	2.66E-06	2.4E-04
		Benz(a)pyrene	3.90E+01	1.00E+02	1.85E-06	1.7E-04
		Indenopyrene	3.70E+01	1.00E+02	1.76E-06	1.6E-04
		Benzoperylene	3.90E+01	1.00E+02	1.85E-06	1.7E-04
		As	5.10E+01	1.00E+02	2.42E-06	2.2E-04
		Ba	1.11E+03	1.00E+02	5.28E-05	4.8E-03
		Hg	4.00E-01	1.00E+02	1.90E-08	1.7E-06
		Ni	6.90E+01	1.00E+02	3.28E-06	3.0E-04
IND096786884	D&H	CN	2.40E+00	1.00E+00	1.14E-07	1.0E-07
		As	1.30E+01	1.00E+00	6.18E-07	5.6E-07
		Cr	6.90E+02	1.00E+00	3.28E-05	3.0E-05
		Hg	4.60E-01	1.00E+00	2.19E-08	2.0E-08
		PCB	2.60E-01	1.00E+00	1.24E-08	1.1E-08
IND980679179	FLEXI-FLO	Benzoanthracene	2.05E+01	1.00E-01	9.75E-07	8.9E-08
		Pyrene	9.30E+00	1.00E-01	4.42E-07	4.0E-08
		Ba	2.41E-01	1.00E-01	1.15E-08	1.0E-09
		Cd	4.00E-03	1.00E-01	1.90E-10	1.7E-11
		1,2-dichloroethylene	4.50E+01	1.00E-01	2.14E-06	1.9E-07
		trichloroethylene	7.90E+00	1.00E-01	3.76E-07	3.4E-08
IND077001808	RALSTON ST.	Ni	1.92E+02	1.20E+01	9.13E-06	1.0E-04
		Cd	2.67E+01	1.20E+01	1.27E-06	1.4E-05
IND069984276	IN HARBOR BELT R	Phenanthrene	3.20E+02	1.00E-01	1.52E-05	1.4E-06
		Chrysene	2.50E+02	1.00E-01	1.19E-05	1.1E-06

TABLE D-5. DATA INPUTS USED TO ESTIMATE FUGITIVE PARTICULATE EMISSIONS

FCID	SITENAME	COMPOUND	C (ppm)	Area (Acres)	Emissions (Tons/Ac*Yr)	Emissions (m tons/yr)
IND069984276	IN HARBOR BELT R (cont.)	Cd	3.50E-02	1.00E-01	1.66E-09	1.5E-10
		Cr	1.01E-01	1.00E-01	4.80E-09	4.4E-10
		Ni	7.80E-02	1.00E-01	3.71E-09	3.4E-10
IND005421755	KEIL CHEMICAL	Toluene	1.30E-01	1.10E+01	6.18E-09	6.2E-08
		Polycyclic Organics	1.45E+00	1.10E+01	6.89E-08	6.9E-07
		As	9.30E+01	1.10E+01	4.42E-06	4.4E-05
		Cr	5.57E+02	1.10E+01	2.65E-05	2.6E-04
		Ni	1.63E+02	1.10E+01	7.75E-06	7.8E-05
IND980500482	NIPSCO #74	Be	1.50E+00	2.00E+00	7.13E-08	1.3E-07
		Cd	1.30E+00	2.00E+00	6.18E-08	1.1E-07
		Cr	8.80E+01	2.00E+00	4.18E-06	7.6E-06
		Hg	2.65E+02	2.00E+00	1.26E-05	2.3E-05
IND980500318	HAMMOND/ILLIANA	Naphthalene	2.30E+00	5.00E+00	1.09E-07	5.0E-07
		Acenaphthalene	2.10E+00	5.00E+00	9.99E-08	4.5E-07
		Fluoranthene	9.60E+00	5.00E+00	4.56E-07	2.1E-06
		Phenanthrene	9.80E+00	5.00E+00	4.66E-07	2.1E-06
		Anthracene	2.20E+00	5.00E+00	1.05E-07	4.8E-07
		Pyrene	1.30E+01	5.00E+00	6.18E-07	2.8E-06
		Benzoberylene	4.20E+00	5.00E+00	2.00E-07	9.1E-07
		Cr	4.50E-02	5.00E+00	2.14E-09	9.7E-09
		Ni	2.50E-02	5.00E+00	1.19E-09	5.4E-09
		CN	2.40E-03	5.00E+00	1.14E-10	5.2E-10
IND980500599	JM FOSTER	Cr	2.90E+01	2.60E+01	1.38E-06	3.3E-05
		Be	7.70E+00	2.60E+01	3.66E-07	8.7E-06
		Hg	4.70E-01	2.60E+01	2.23E-08	5.3E-07
IND980679047	BONGI CARTAGE	Ba	9.01E+02	2.50E+01	4.28E-05	9.7E-04
		Cr	2.70E+01	2.50E+01	1.28E-06	2.9E-05
IND014387880	CALUMENT IND.	Arochlor 1260	5.20E+02	2.00E+00	2.47E-05	4.5E-05
		Ni	5.40E+01	2.00E+00	2.57E-06	4.7E-06
IND060370343	SWIFT ADHESIVES	PCB	6.60E+04	1.00E-01	3.14E-03	2.9E-04
IND054101415	WOLF LAKE TERM.	As	3.00E+01	5.00E-01	1.43E-06	6.5E-07
		Be	7.90E+00	5.00E-01	3.76E-07	1.7E-07
		Cr	2.13E+02	5.00E-01	1.01E-05	4.6E-06
		Ni	2.20E+01	5.00E-01	1.05E-06	4.8E-07
		CN	4.90E+01	5.00E-01	2.33E-06	1.1E-06
		Trichloroethylene	4.00E+01	5.00E-01	1.90E-06	8.6E-07
IND004387842	HAMMOND COLD BAR	Cr	1.00E+01	1.00E+00	4.75E-07	4.3E-07
		Pb	1.00E+02	1.00E+00	4.75E-06	4.3E-06
IND981094071	HOUSE'S J-YARD	As	1.40E+01	2.00E+00	6.66E-07	1.2E-06
		Be	1.40E+00	2.00E+00	6.66E-08	1.2E-07
		Ni	2.90E+01	2.00E+00	1.38E-06	2.5E-06
		Chloroform	3.90E+01	2.00E+00	1.85E-06	3.4E-06
		2-methylnaphthalene	6.60E+02	2.00E+00	3.14E-05	5.7E-05
		Phenathrene	1.40E+03	2.00E+00	6.66E-05	1.2E-04
		Pyrene	2.10E+03	2.00E+00	9.99E-05	1.8E-04

TABLE D-5. DATA INPUTS USED TO ESTIMATE FUGITIVE PARTICULATE EMISSIONS

FCID	SITENAME	COMPOUND	C (ppm)	Area (Acre)	Emissions (Tons/Ac*Yr)	Emissions (m tons/yr)
IND095264813	LURIA BROS.	Hg	9.19E+02	5.00E+00	4.37E-05	2.0E-04
		Cd	3.60E+01	5.00E+00	1.71E-06	7.8E-06
		As	5.60E+01	5.00E+00	2.66E-06	1.2E-05
		Ni	1.67E+02	5.00E+00	7.94E-06	3.6E-05
		CN	2.90E+00	5.00E+00	1.38E-07	6.3E-07
ILD000672790	LAND + LAKES	Arsenic	1.00E-01	5.25E+01	6.16E-09	2.9E-07
		Cadmium	7.00E-01	5.25E+01	4.31E-08	2.1E-06
		Nickel	3.60E+00	5.25E+01	2.22E-07	1.1E-05
		Chromium	2.50E+00	5.25E+01	1.54E-07	7.4E-06
		Mercury	1.00E-01	5.25E+01	6.16E-09	2.9E-07
ILD000716852	ALBURN INC.	PCB-1242	1.00E+02	1.00E+01	6.16E-06	5.6E-05
		As	4.00E+01	1.00E+01	2.46E-06	2.2E-05
		Cr	1.40E+02	1.00E+01	8.63E-06	7.8E-05
ILD981194699	CHICAGO STREETS	Cd	1.60E+01	2.28E+02	9.86E-07	2.0E-04
		Ni	8.20E+01	2.28E+02	5.05E-06	1.0E-03
		Hg	1.00E-01	2.28E+02	6.16E-09	1.3E-06
ILD005213285	INT. HARV.	Asbestos	1.00E+02	2.13E+01	6.16E-06	1.2E-04
ILD001744572	TRIEM STEEL	Chromium	1.00E+04	1.00E+00	6.16E-04	5.6E-04
		Naphthalene	1.50E+05	1.00E+00	9.24E-03	8.4E-03
ILD001833714	ALLIED CHEM CORP	Cd	1.60E+01	1.64E+00	9.86E-07	1.5E-06
		Ni	8.20E+01	1.64E+00	5.05E-06	7.5E-06
ILD0050086673	ROUSSELLE CORP	Toluene	1.00E+04	1.00E+00	6.16E-04	5.6E-04
		Cr	5.60E+01	1.00E+00	3.45E-06	3.1E-06
		Hy	1.20E+01	1.00E+00	7.39E-07	6.7E-07
ILD005246590	HALL ALUMINUM CO	Cd	8.50E+01	1.00E+00	5.24E-06	4.8E-06
		Cr	7.00E+00	1.00E+00	4.31E-07	3.9E-07
ILD051069854	AMCA INTL	Cd	1.00E+00	1.00E+00	6.16E-08	5.6E-08
		Cr	5.00E+00	1.00E+00	3.08E-07	2.8E-07
		PCBs	2.60E+03	1.00E+00	1.60E-04	1.5E-04
ILD980902050	LOBUE#2	Cr	5.60E+01	1.00E+00	3.45E-06	3.1E-06
		Hg	1.20E+01	1.00E+00	7.39E-07	6.7E-07
		Cd	6.00E+01	1.00E+00	3.70E-06	3.4E-06
		Toluene	1.00E+04	1.00E+00	6.16E-04	5.6E-04
ILD981531882	LAND+LAKES #2 (Cottage Grove L	Cd	1.60E+01	1.42E+01	9.86E-07	1.3E-05
		Cr	5.00E+00	1.42E+01	3.08E-07	4.0E-06
		Hg	2.00E-01	1.42E+01	1.23E-08	1.6E-07
ILD981959208	OLD PULLMAN FARM	As	5.00E+00	1.42E+02	3.08E-07	4.0E-05
		Cr	5.00E+00	1.42E+02	3.08E-07	4.0E-05
		Cd	1.60E+01	1.42E+02	9.86E-07	1.3E-04
		Ni	8.20E+01	1.42E+02	5.05E-06	6.5E-04
ILD980498349	MSD#4 SLUDGE AND	Cr	1.50E+02	2.03E+00	9.24E-06	1.7E-05

TABLE D-5. DATA INPUTS USED TO ESTIMATE FUGITIVE PARTICULATE EMISSIONS

FCID	SITENAME	COMPOUND	C (ppm)	Area (Acre)	Emissions (Tons/Ac*Yr)	Emissions (m tons/yr)
IND980679211	IND CINDERS	PCBs	2.28E+01	3.40E+01	1.40E-06	4.3E-05
		POMs	9.50E+00	3.40E+01	5.85E-07	1.8E-05
		Diethylphthalate	1.40E+01	3.40E+01	8.63E-07	2.7E-05
		As	6.10E+01	3.40E+01	3.76E-06	1.2E-04
		Hg	3.30E-01	3.40E+01	2.03E-08	6.3E-07
IND980607469	CITIES SERVICES	Phenanthrene	4.20E+01	5.00E+00	2.59E-06	1.2E-05
		Fluoranthene	4.50E+01	5.00E+00	2.77E-06	1.3E-05
		Pyrene	4.40E+01	5.00E+00	2.71E-06	1.2E-05
		Benzo(a)anthracene	1.20E+02	5.00E+00	7.39E-06	3.4E-05
		Chrysene	2.00E+02	5.00E+00	1.23E-05	5.6E-05
		Benzo(a)pyrene	5.90E+01	5.00E+00	3.63E-06	1.7E-05
		2-methylnaphthalene	6.70E+01	5.00E+00	4.13E-06	1.9E-05
IND074379306	AMOCO RESEARCH	Benzo(a)pyrene	3.20E+00	5.00E+00	1.97E-07	9.0E-07
		Phenanthrene	3.50E+00	5.00E+00	2.16E-07	9.8E-07
		Arochlor-1254	1.70E-02	5.00E+00	1.05E-09	4.8E-09
		Hexachlorobenzene	6.40E+00	5.00E+00	3.94E-07	1.8E-06
ILD000646786	MORECO	Benzo(A)anthracene	4.00E+04	5.00E-02	2.46E-03	1.1E-04
		Benzo(a)pyrene	1.00E+04	5.00E-02	6.16E-04	2.8E-05
ILD059446153	RIVERDALE CHEM	Dioxin	1.00E-03	5.00E+00	6.16E-11	2.8E-10
ILD980606347	B&O RR-BAR YARD	Acrylonitrile	1.00E+01	7.00E-02	6.16E-07	3.9E-08
		Pentachlorophenol	7.80E+02	3.00E-01	4.81E-05	1.3E-05
ILD980616460	CHICAGO PLT YARD	Toluene	8.00E+05	2.50E-03	4.93E-02	1.1E-04

APPENDIX E
STRING DATA INPUT FILES SUBMITTED FOR PIPQUIC SYSTEM

TABLE E-1. STRING DATA INPUT FILES SUBMITTED TO PIPQUIC SYSTEM

ST	CNTY	SITE	NAME OF FACILITY	APT	UZ	UTMX	UTMY	HT	DIA	LGTH	SCC	POLL#	EMISSIONS	POLLUTANT NAME
14	1540	W001	ALBURN INC.	A00	16	453.6	4614.5		660.0	660.0	HWSITE	12103	0.000022	Arsenic
14	1540	W001	ALBURN INC.	A00	16	453.6	4614.5		660.0	660.0	HWSITE	12112	0.000078	Chromium
14	1540	W001	ALBURN INC.	A00	16	453.6	4614.5		660.0	660.0	HWSITE	17899	0.000056	PCB
14	1540	W002	ALLIED CHEM CORP	A00	16	454.5	4611.4		568.2	568.2	HWSITE	12110	0.000002	Cadmium
14	1540	W002	ALLIED CHEM CORP	A00	16	454.5	4611.4		568.2	568.2	HWSITE	12136	0.000008	Nickel
14	1540	W003	AMCA INTL	A00	16	443.8	4592.4		208.7	208.7	HWSITE	12110	0.000000	Cadmium
14	1540	W003	AMCA INTL	A00	16	443.8	4592.4		208.7	208.7	HWSITE	12112	0.000000	Chromium
14	1540	W003	AMCA INT'L	A00	16	443.8	4592.4		208.7	208.7	HWSITE	17899	0.000150	PCB
14	1540	W004	B+O RR-BARR YARD	A00	16	448.1	4610.0		54.8	54.8	HWSITE	43704	0.000000	Acrylonitrile
14	1540	W004	B+O RR-BARR YARD	A00	16	448.1	4610.0		54.8	54.8	HWSITE	45399	0.000025	Pentachlorophenol
14	1540	W005	CHICAGO PLT YARD	A00	16	436.7	4624.9		10.5	10.5	HWSITE	45202	0.000370	Toluene
14	1540	W006	CHICAGO STREETS	A00	16	451.5	4616.4		3130.7	3130.7	HWSITE	12110	0.000200	Cadmium
14	1540	W006	CHICAGO STREETS	A00	16	451.5	4616.4		3130.7	3130.7	HWSITE	12136	0.001000	Nickel
14	1540	W006	CHICAGO STREETS	A00	16	451.5	4616.4		3130.7	3130.7	HWSITE	12142	0.000001	Mercury
14	1540	W007	ESTECH CHEMICAL	A00	16	455.0	4607.9		590.3	590.3	HWSITE	51104	0.000000	Chlordane
14	1540	W007	ESTECH CHEMICAL	A00	16	455.0	4607.9		590.3	590.3	HWSITE	52119	0.000000	Parathion
14	1540	W008	HALL ALUMINUM	A00	16	453.4	4593.1		208.7	208.7	HWSITE	12110	0.000005	Cadmium
14	1540	W008	HALL ALUMINUM	A00	16	453.4	4593.1		208.7	208.7	HWSITE	12112	0.000000	Chromium
14	1540	W009	INTERLAKE LF + COKE	A00	16	455.5	4618.8		2469.5	2469.5	HWSITE	45201	0.000008	Benzene
14	1540	W009	INTERLAKE LF + COKE	A00	16	455.5	4618.8		2469.5	2469.5	HWSITE	45202	0.000008	Toluene
14	1540	W009	INTERLAKE LF + COKE	A00	16	455.5	4618.8		2469.5	2469.5	HWSITE	17299	0.001600	Naphthalene
14	1540	W010	INT. HARV.	A00	16	444.9	4615.6		956.4	956.4	HWSITE	12801	0.000120	Asbestos
14	1540	W011	LAND AND LAKES #2	A00	16	429.2	4610.2		780.9	780.9	HWSITE	12110	0.000013	Cadmium
14	1540	W011	LAND AND LAKES #2	A00	16	429.2	4610.2		780.9	780.9	HWSITE	12112	0.000004	Chromium
14	1540	W011	LAND AND LAKES #2	A00	16	429.2	4610.2		780.9	780.9	HWSITE	12142	0.000000	Mercury
14	1540	W012	LAND + LAKE #3	A00	16	455.5	4618.8		1505.0	1505.0	HWSITE	12103	0.000000	Arsenic
14	1540	W012	LAND + LAKE #3	A00	16	455.5	4618.8		1505.0	1505.0	HWSITE	12110	0.000002	Cadmium
14	1540	W012	LAND + LAKE #3	A00	16	455.5	4618.8		1505.0	1505.0	HWSITE	12112	0.000011	Chromium
14	1540	W012	LAND + LAKE #3	A00	16	455.5	4618.8		1505.0	1505.0	HWSITE	12136	0.000007	Nickel
14	1540	W012	LAND + LAKE #3	A00	16	455.5	4618.8		1505.0	1505.0	HWSITE	12142	0.000000	Mercury
14	1540	W013	LOBUE #2	A00	16	453.4	4593.1		208.7	208.7	HWSITE	12110	0.000003	Cadmium
14	1540	W013	LOBUE #2	A00	16	453.4	4593.1		208.7	208.7	HWSITE	12112	0.000003	Chromium
14	1540	W013	LOBUE #2	A00	16	453.4	4593.1		208.7	208.7	HWSITE	12142	0.000001	Mercury
14	1540	W013	LOBUE #2	A00	16	453.4	4593.1		208.7	208.7	HWSITE	45202	0.001500	Toluene
14	1540	W014	MORECO	A00	16	427.7	4628.1		46.7	46.7	HWSITE	17299	0.000270	Benzo(A)anthracene
14	1540	W014	MORECO	A00	16	427.7	4628.1		46.7	46.7	HWSITE	17299	0.000064	Benzo(A)pyrene
14	1540	W015	MSD#4 SLUDGE + BARREA	A00	16	454.5	4611.4		295.2	295.2	HWSITE	12112	0.000017	Chromium
14	1540	W016	OLD PULLMAN FARM	A00	16	444.9	4615.6		2469.5	2469.5	HWSITE	12103	0.000040	Arsenic
14	1540	W016	OLD PULLMAN FARM	A00	16	444.9	4615.6		2469.5	2469.5	HWSITE	12110	0.000040	Cadmium
14	1540	W016	OLD PULLMAN FARM	A00	16	444.9	4615.6		2469.5	2469.5	HWSITE	12112	0.000130	Chromium
14	1540	W016	OLD PULLMAN FARM	A00	16	444.9	4615.6		2469.5	2469.5	HWSITE	12136	0.000650	Nickel
14	1540	W017	RIVERDALE CHEM	A00	16	453.4	4593.1		466.7	466.7	HWSITE	45899	0.000000	Dioxin
14	1540	W018	ROUSSELLE CORP	A00	16	446.1	4617.4		208.7	208.7	HWSITE	12112	0.000003	Chromium
14	1540	W018	ROUSSELLE CORP	A00	16	446.1	4617.4		208.7	208.7	HWSITE	12142	0.000001	Mercury
14	1540	W018	ROUSSELLE CORP	A00	16	446.1	4617.4		208.7	208.7	HWSITE	45202	0.008400	Toluene
14	1540	W019	TRIEM STEEL	A00	16	453.4	4593.1		208.7	208.7	HWSITE	12112	0.000560	Chromium
14	1540	W019	TRIEM STEEL	A00	16	453.4	4593.1		208.7	208.7	HWSITE	17299	0.096000	Naphthalene
15	2360	W020	AMOCO RESEARCH	A00	16	459.5	4613.6		466.7	466.7	HWSITE	17899	0.000000	PCB
15	2360	W020	AMOCO RESEARCH	A00	16	459.5	4613.6		466.7	466.7	HWSITE	45890	0.000500	Hexachlorobenzene

TABLE E-1. STRING DATA INPUT FILES SUBMITTED TO PIPQUIC SYSTEM

ST	CNTY	SITE	NAME OF FACILITY	APT	UZ	UTMX	UTMY	HT	DIA	LGTH	SCC	POLL#	EMISSIONS	POLLUTANT NAME
15	2360	W020	AMOCO RESEARCH	A00	16	459.5	4613.6		466.7	466.7	HWSITE	17299	0.000001	Phenanthrene
15	2360	W020	AMOCO RESEARCH	A00	16	459.5	4613.6		466.7	466.7	HWSITE	17299	0.000001	Benz(A)pyrene
15	2360	W021	ANDERSON DEV	A00	16	469.4	4601.5		20.9	20.9	HWSITE	12103	0.000000	Arsenic
15	2360	W021	ANDERSON DEV	A00	16	469.4	4601.5		20.9	20.9	HWSITE	12105	0.000000	Beryllium
15	2360	W021	ANDERSON DEV	A00	16	469.4	4601.5		20.9	20.9	HWSITE	12110	0.000000	Cadmium
15	2360	W021	ANDERSON DEV	A00	16	469.4	4601.5		20.9	20.9	HWSITE	12112	0.000000	Chromium
15	2360	W021	ANDERSON DEV	A00	16	469.4	4601.5		20.9	20.9	HWSITE	12142	0.000000	Mercury
15	2360	W021	ANDERSON DEV	A00	16	469.4	4601.5		20.9	20.9	HWSITE	45220	0.000000	Styrene
15	2360	W021	ANDERSON DEV	A00	16	469.4	4601.5		20.9	20.9	HWSITE	45999	0.000000	Diocetylphthalate
15	2360	W021	ANDERSON DEV	A00	16	469.4	4601.5		20.9	20.9	HWSITE	17299	0.000008	Benzofluoranthene
15	2360	W022	BAIRSTOW CO	A00	16	457.4	4612.1		2087.1	2087.1	HWSITE	12103	0.000220	Arsenic
15	2360	W022	BAIRSTOW CO	A00	16	457.4	4612.1		2087.1	2087.1	HWSITE	12136	0.000300	Nickel
15	2360	W022	BAIRSTOW CO	A00	16	457.4	4612.1		2087.1	2087.1	HWSITE	12142	0.000002	Mercury
15	2360	W022	BAIRSTOW CO	A00	16	457.4	4612.1		2087.1	2087.1	HWSITE	17299	0.000091	Phenanthrene
15	2360	W022	BAIRSTOW CO	A00	16	457.4	4612.1		2087.1	2087.1	HWSITE	17299	0.000180	Fluoranthene
15	2360	W022	BAIRSTOW CO	A00	16	457.4	4612.1		2087.1	2087.1	HWSITE	17299	0.000220	Pyrene
15	2360	W022	BAIRSTOW CO	A00	16	457.4	4612.1		2087.1	2087.1	HWSITE	17299	0.000240	Benzofluoranthene
15	2360	W022	BAIRSTOW CO	A00	16	457.4	4612.1		2087.1	2087.1	HWSITE	17299	0.000170	Benz(a)pyrene
15	2360	W022	BAIRSTOW CO	A00	16	457.4	4612.1		2087.1	2087.1	HWSITE	17299	0.000160	Indenopyrene
15	2360	W022	BAIRSTOW CO	A00	16	457.4	4612.1		2087.1	2087.1	HWSITE	17299	0.000170	Benzoperylene
15	2360	W023	BONGI CARTAGE	A00	16	465.7	4604.0		1043.5	1043.5	HWSITE	12112	0.000029	Chromium
15	2360	W024	CALUMET IND	A00	16	465.7	4604.0		295.2	295.2	HWSITE	12136	0.000005	Nickel
15	2360	W024	CALUMET IND	A00	16	465.7	4604.0		295.2	295.2	HWSITE	17899	0.000045	PCB
15	2360	W025	CITIES SERVICE	A00	16	466.4	4607.4		563.1	563.1	HWSITE	17299	0.000019	2-methylnapthalene
15	2360	W025	CITIES SERVICE	A00	16	466.4	4607.4		563.1	563.1	HWSITE	17299	0.000012	Phenanthrene
15	2360	W025	CITIES SERVICE	A00	16	466.4	4607.4		563.1	563.1	HWSITE	17299	0.001000	Benz(A)pyrene
15	2360	W025	CITIES SERVICE	A00	16	466.4	4607.4		563.1	563.1	HWSITE	17299	0.000013	Fluoranthene
15	2360	W025	CITIES SERVICE	A00	16	466.4	4607.4		563.1	563.1	HWSITE	17299	0.000012	Pyrene
15	2360	W025	CITIES SERVICE	A00	16	466.4	4607.4		563.1	563.1	HWSITE	17299	0.000056	Chrysene
15	2360	W025	CITIES SERVICE	A00	16	466.4	4607.4		563.1	563.1	HWSITE	17299	0.000034	Benzoanthracene
15	2360	W026	D & H	A00	16	457.9	4608.6		208.7	208.7	HWSITE	12103	0.000001	Arsenic
15	2360	W026	D & H	A00	16	457.9	4608.6		208.7	208.7	HWSITE	12112	0.000030	Chromium
15	2360	W026	D & H	A00	16	457.9	4608.6		208.7	208.7	HWSITE	12142	0.000000	Mercury
15	2360	W026	D & H	A00	16	457.9	4608.6		208.7	208.7	HWSITE	17899	0.000000	PCB
15	2360	W027	FLEXIFLOW	A00	16	462.6	4604.7		66.0	66.0	HWSITE	12110	0.000000	Cadmium
15	2360	W027	FLEXIFLOW	A00	16	462.6	4604.7		66.0	66.0	HWSITE	43815	0.000000	1,2-dichlorethylene
15	2360	W027	FLEXIFLOW	A00	16	462.6	4604.7		66.0	66.0	HWSITE	17299	0.000000	Pyrene
15	2360	W027	FLEXIFLOW	A00	16	462.6	4604.7		66.0	66.0	HWSITE	43824	0.000000	Trichloroethylene
15	2360	W027	FLEXIFLOW	A00	16	462.6	4604.7		66.0	66.0	HWSITE	17299	0.000000	Benzoanthracene
15	2360	W028	HAMMOND COLD BA	A00	16	462.1	4612.0		208.7	208.7	HWSITE	12112	0.000000	Chromium
15	2360	W029	HAMMOND/ILLIANA	A00	16	457.6	4600.9		466.7	466.7	HWSITE	12112	0.000000	Chromium
15	2360	W029	HAMMOND/ILLIANA	A00	16	457.6	4600.9		466.7	466.7	HWSITE	12136	0.000000	Nickel
15	2360	W029	HAMMOND/ILLIANA	A00	16	457.6	4600.9		466.7	466.7	HWSITE	17299	0.000001	Napthalene
15	2360	W029	HAMMOND/ILLIANA	A00	16	457.6	4600.9		466.7	466.7	HWSITE	17299	0.000000	Accnapthalene
15	2360	W029	HAMMOND/ILLIANA	A00	16	457.6	4600.9		466.7	466.7	HWSITE	17299	0.000002	Phenanthrene
15	2360	W029	HAMMOND/ILLIANA	A00	16	457.6	4600.9		466.7	466.7	HWSITE	17299	0.000000	Anthracene
15	2360	W029	HAMMOND/ILLIANA	A00	16	457.6	4600.9		466.7	466.7	HWSITE	17299	0.000002	Fluoranthene
15	2360	W029	HAMMOND/ILLIANA	A00	16	457.6	4600.9		466.7	466.7	HWSITE	17299	0.000003	Pyrene
15	2360	W029	HAMMOND/ILLIANA	A00	16	457.6	4600.9		466.7	466.7	HWSITE	17299	0.000001	Benzoberylene

TABLE E-1. STRING DATA INPUT FILES SUBMITTED TO PIPQUIC SYSTEM

ST	CNTY	SITE	NAME OF FACILITY	APT	UZ	UTMX	UTMY	HT	DIA	LGTH	SCC	POLL#	EMISSIONS	POLLUTANT NAME
15	2360	W030	HOUSE'S J-YARD	A00	16	465.7	4604.0		295.2	295.2	HWSITE	12103	0.000001	Arsenic
15	2360	W030	HOUSE'S J-YARD	A00	16	465.7	4604.0		295.2	295.2	HWSITE	12105	0.000000	Beryllium
15	2360	W030	HOUSE'S J-YARD	A00	16	465.7	4604.0		295.2	295.2	HWSITE	12136	0.000003	Nickel
15	2360	W030	HOUSE'S J-YARD	A00	16	465.7	4604.0		295.2	295.2	HWSITE	43803	0.000012	Chloroform
15	2360	W030	HOUSE'S J-YARD	A00	16	465.7	4604.0		295.2	295.2	HWSITE	17299	0.000057	2-methylnaphthalene
15	2360	W030	HOUSE'S J-YARD	A00	16	465.7	4604.0		295.2	295.2	HWSITE	17299	0.000120	Phenanthrene
15	2360	W030	HOUSE'S J-YARD	A00	16	465.7	4604.0		295.2	295.2	HWSITE	17299	0.000180	Pyrene
15	2360	W031	IN HARBOR BELT	A00	16	457.6	4600.9		66.0	66.0	HWSITE	12110	0.000000	Cadmium
15	2360	W031	IN HARBOR BELT	A00	16	457.6	4600.9		66.0	66.0	HWSITE	12112	0.000000	Chromium
15	2360	W031	IN HARBOR BELT	A00	16	457.6	4600.9		66.0	66.0	HWSITE	12136	0.000000	Nickel
15	2360	W031	IN HARBOR BELT	A00	16	457.6	4600.9		66.0	66.0	HWSITE	17299	0.000001	Phenanthrene
15	2360	W031	IN HARBOR BELT	A00	16	457.6	4600.9		66.0	66.0	HWSITE	17299	0.000001	Chrysene
15	2360	W032	IND CINDERS	A00	16	472.2	4605.2		1217.0	1217.0	HWSITE	12103	0.000120	Arsenic
15	2360	W032	IND CINDERS	A00	16	472.2	4605.2		1217.0	1217.0	HWSITE	12142	0.000001	Mercury
15	2360	W032	IND CINDERS	A00	16	472.2	4605.2		1217.0	1217.0	HWSITE	17299	0.000018	POMs
15	2360	W032	IND CINDERS	A00	16	472.2	4605.2		1217.0	1217.0	HWSITE	17899	0.000043	PCBs
15	2360	W032	IND CINDERS	A00	16	472.2	4605.2		1217.0	1217.0	HWSITE	45999	0.000027	Diocetylphthalate
15	2360	W033	JM FOSTER	A00	16	472.2	4607.0		1064.2	1064.2	HWSITE	12105	0.000009	Beryllium
15	2360	W033	JM FOSTER	A00	16	472.2	4607.0		1064.2	1064.2	HWSITE	12112	0.000034	Chromium
15	2360	W033	JM FOSTER	A00	16	472.2	4607.0		1064.2	1064.2	HWSITE	12142	0.000001	Mercury
15	2360	W034	KEIL CHEMICAL	A00	16	457.9	4608.6		692.2	692.2	HWSITE	12103	0.000044	Arsenic
15	2360	W034	KEIL CHEMICAL	A00	16	457.9	4608.6		692.2	692.2	HWSITE	12112	0.000260	Chromium
15	2360	W034	KEIL CHEMICAL	A00	16	457.9	4608.6		692.2	692.2	HWSITE	12136	0.000078	Nickel
15	2360	W034	KEIL CHEMICAL	A00	16	457.9	4608.6		692.2	692.2	HWSITE	17299	0.000001	Polycyclic organics
15	2360	W034	KEIL CHEMICAL	A00	16	457.9	4608.6		692.2	692.2	HWSITE	45202	0.000000	Toluene
15	2360	W035	LURIA BROS.	A00	16	465.1	4608.2		466.7	466.7	HWSITE	12103	0.000012	Arsenic
15	2360	W035	LURIA BROS.	A00	16	465.1	4608.2		466.7	466.7	HWSITE	12110	0.000008	Cadmium
15	2360	W035	LURIA BROS.	A00	16	465.1	4608.2		466.7	466.7	HWSITE	12136	0.000036	Nickel
15	2360	W035	LURIA BROS.	A00	16	465.1	4608.2		466.7	466.7	HWSITE	12142	0.000200	Mercury
15	2360	W036	MOBIL CHEN/P DI	A00	16	473.6	4603.4		295.2	295.2	HWSITE	12110	0.000000	Cadmium
15	2360	W036	MOBIL CHEN/P DI	A00	16	473.6	4603.4		295.2	295.2	HWSITE	12142	0.000001	Mercury
15	2360	W036	MOBIL CHEN/P DI	A00	16	473.6	4603.4		295.2	295.2	HWSITE	45890	0.000001	1,2-dichlorobenzene
15	2360	W036	MOBIL CHEN/P DI	A00	16	473.6	4603.4		295.2	295.2	HWSITE	45102	0.000014	Xylene
15	2360	W036	MOBIL CHEN/P DI	A00	16	473.6	4603.4		295.2	295.2	HWSITE	45202	0.000001	Toluene
15	2360	W036	MOBIL CHEN/P DI	A00	16	473.6	4603.4		295.2	295.2	HWSITE	45399	0.000005	Pentachlorophenol
15	2360	W036	MOBIL CHEN/P DI	A00	16	473.6	4603.4		295.2	295.2	HWSITE	45999	0.000009	Diocetylphthalate
15	2360	W036	MOBIL CHEN/P DI	A00	16	473.6	4603.4		295.2	295.2	HWSITE	17299	0.000001	2-methylnaphthalene
15	2360	W036	MOBIL CHEN/P DI	A00	16	473.6	4603.4		295.2	295.2	HWSITE	17299	0.000002	Naphthalene
15	2360	W037	MOBIL OIL	A00	16	460.0	4610.3		2087.1	2087.1	HWSITE	45102	49.800000	Xylene
15	2360	W037	MOBIL OIL	A00	16	460.0	4610.3		2087.1	2087.1	HWSITE	45202	7.000000	Toluene
15	2360	W037	MOBIL OIL	A00	16	460.0	4610.3		2087.1	2087.1	HWSITE	45203	11.500000	Ethyl Benzene
15	2360	W038	NIPSCO #74	A00	16	466.2	4609.6		295.2	295.2	HWSITE	12105	0.000000	Beryllium
15	2360	W038	NIPSCO #74	A00	16	466.2	4609.6		295.2	295.2	HWSITE	12110	0.000000	Cadmium
15	2360	W038	NIPSCO #74	A00	16	466.2	4609.6		295.2	295.2	HWSITE	12112	0.000008	Chromium
15	2360	W038	NIPSCO #74	A00	16	466.2	4609.6		295.2	295.2	HWSITE	12142	0.000023	Mercury
15	2360	W039	RALSTON ST	A00	16	472.2	4605.2		722.9	722.9	HWSITE	12110	0.000014	Cadmium
15	2360	W039	RALSTON ST	A00	16	472.2	4605.2		722.9	722.9	HWSITE	12136	0.000100	Nickel
15	2360	W040	SWIFT ADHESIVES	A00	16	460.9	4604.7		933.4	933.4	HWSITE	17899	0.000290	PCB
15	2360	W041	VULCAN MATS	A00	16	462.2	4606.8		90.0	270.0	HWSITE	12103	0.000000	Arsenic

TABLE E-1. STRING DATA INPUT FILES SUBMITTED TO PIPQUIC SYSTEM

ST	CNTY	SITE	NAME OF FACILITY	APT	UZ	UTMX	UTMY	HT	DIA	LGTH	SCC	POLL#	EMISSIONS	POLLUTANT NAME
15	2360	W041	VULCAN MATS	A00	16	462.2	4606.8		90.0	270.0	HWSITE	12112	0.000000	Chromium
15	2360	W041	VULCAN MATS	A00	16	462.2	4606.8		90.0	270.0	HWSITE	12142	0.000000	Mercury
15	2360	W042	WOLF LAKE TERM	A00	16	457.9	4608.6		466.7	466.7	HWSITE	12103	0.000001	Arsenic
15	2360	W042	WOLF LAKE TERM	A00	16	457.9	4608.6		466.7	466.7	HWSITE	12105	0.000000	Beryllium
15	2360	W042	WOLF LAKE TERM	A00	16	457.9	4608.6		466.7	466.7	HWSITE	12112	0.000005	Chromium
15	2360	W042	WOLF LAKE TERM	A00	16	457.9	4608.6		466.7	466.7	HWSITE	12136	0.000000	Nickel
15	2360	W042	WOLF LAKE TERM	A00	16	457.9	4608.6		466.7	466.7	HWSITE	43824	0.000001	Trichlorethylene

TECHNICAL REPORT DATA (Please read instructions on the reverse before completing)		
1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Estimation of Air Emissions From Abandoned Hazardous Waste Sites In The Southeast Chicago Area		5. REPORT DATE May 1989
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Thomas E. Warn David J. Zimmerman		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Alliance Technologies Corporation 100 Europa Drive Chapel Hill, NC 27514		10. PROGRAM ELEMENT NO.
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15. SUPPLEMENTARY NOTES ARB Project Officer is John Summerhays, MD 5AR-26 312/886-6067		
16. ABSTRACT This report documents and describes the methodologies employed to collect site-specific information and develop air emission estimates for abandoned hazardous waste sites within the Southeast Chicago study area. In total, 261 potential waste sites were identified within the study area. Review of the available information for each potential site revealed that 90 of these sites should be removed from further consideration and that additional information was required to assess the potential air emission impacts from 129 others. The remaining 42 abandoned hazardous waste sites were modeled for air emissions potential. The analyses performed included emissions estimations from landfills, waste piles/open dumps, surface spills, and disposal impoundments. The models selected for this study provide emissions estimates based on either volatilization or wind entrainment of contaminated particulate material. The total air emissions for each specific site was then calculated as the sum of the volatilization and fugitive particulate estimate for each specific substance present at the site.		
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