DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Agency for Toxic Substances
and Disease Registry
Atlanta GA 30333

January 23, 2003

Ms. Pam Sculley
United States Environmental Protection Agency
Region 4
Atlanta Federal Center
61 Forsyth Street, Southwest
Atlanta, GA 30303-3104

Dear Ms. Sculley:

Enclosed please find a copy of the Health Consultation-public comment release for Anniston PCB Site (Monsanto Company), Anniston, Calhoun County, Alabama, EPA FACILITY ID: ALD004019048, dated January 17, 2003. This health consultation reviews ambient air PCB data collected by Solutia, Inc., and the U.S. Environmental Protection Agency.

The public is invited to comment on this Health Consultation. There will be a time period for written comments, which will run until March 21, 2003. Please address correspondence to the Chief, Program Evaluation, Records, and Information Services Branch, Division of Health Assessment and Consultation, Agency for Toxic Substances and Disease Registry, ATTN: Anniston PCB Site (Monsanto Company), 1600 Clifton Road, NE (E60), Atlanta, Georgia 30333.

If you have any questions or comments about this Health Consultation, please direct them to Lynn Wilder, health assessor, at (404) 498-0461.

Sincerely yours,

Max M. Howie, Jr.
Chief, Program Evaluation, Records,
and Information Services Branch
Division of Health Assessment
and Consultation

Enclosure

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Health Consultation

PUBLIC COMMENT RELEASE

Anniston PCB Air Sampling

ANNISTON PCB SITE (MONSANTO COMPANY)

ANNISTON, CALHOUN COUNTY, ALABAMA

EPA FACILITY ID: ALD004019048

JANUARY 17, 2003

Public Comment End Date: March 21, 2003

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material. In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members.

The Public Comment Period is an opportunity for the general public to comment on Agency findings or proposed activities for this written consultation. The purposes of the comment period are to 1) provide the public, particularly the community associated with a site, the opportunity to comment on the public health findings, 2) evaluate whether the community health concerns have been adequately addressed, and 3) provide ATSDR with additional information. There will be a time period for written comments, which will run until March 21, 2003. Please address correspondence to the Chief, Program Evaluation, Records, and Information Services Branch, Division of Health Assessment and Consultation, Agency for Toxic Substances and Disease Registry: Anniston PCB Site (Monsanto Company), 1600 Clifton Road, NE (E60), Atlanta, Georgia 30333.

The conclusions and recommendations presented in this health consultation are the result of site specific analyses and are not to be cited or quoted for other evaluations or health consultations.

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HEALTH CONSULTATION

PUBLIC COMMENT RELEASE

Anniston PCB Air Sampling

ANNISTON PCB SITE (MONSANTO COMPANY)

ANNISTON, CALHOUN COUNTY, ALABAMA

EPA FACILITY ID: ALD004019048

Prepared by:

Exposure Investigation and Consultation Branch
Division of Health Assessment and Consultation
Agency for Toxic Substances and Disease Registry

Background and Statement of Issues

As part of ongoing Agency for Toxic Substances and Disease Registry (ATSDR) activities surrounding polychlorinated biphenyl (PCB) contamination and public health implications in the Anniston, Alabama, area, this health consultation reviews ambient air PCB data collected by Solutia Inc., and the U.S. Environmental Protection Agency (EPA) [1,2]. The data reviewed in this consultation are specific to the PCB air sampling that occurred from January 2000 through January 2001. Solutia Inc., has continued to conduct air sampling since January 2001; these data have been continually provided to ATSDR for review. The more recent sampling results are similar to those reviewed and discussed in this document.

Because the sampling results are expressed in several different ways, three definitions of PCBs are provided here: Aroclor, congener number, and congener class (or homolog). A PCB Aroclor is a name given to formerly commercial PCB products. Aroclors were named according to the different percent chlorine, by weight, that the PCB mixture contained. For example, Aroclor 1242 contained approximately 42 percent chlorine by weight. A PCB congener number refers to the specific location(s) of the chlorine(s) on the biphenyl molecule. From one to ten chlorines can be found on a biphenyl structure. For example, PCB congener number 28 is a tri-chlorinated biphenyl, with chlorines attached at the 2, 4, and 4' locations on the biphenyl carbons. There are a total of 209 possible congener numbers. PCB congener numbers can be grouped into one of ten (mono through deca) congener classes by number of chlorines. For example, congener numbers 4 through 15 each have two chlorine molecules; these 12 congener numbers make up the dichlorophenyl congener class. It should be noted that individual Aroclors were made up of varying amounts of PCBs by congener class. For example, Aroclor 1242 contained varying amounts of mono- through hepta- PCB congener classes [3].

Description of Sampling and Analysis

Solutia Inc., collected 24-hour air samples two days per month at five locations on or near their facility property boundaries from January 2000 through January 2001. The U.S. EPA Region IV collected 24-hour samples for two days in June 2000, at eight locations (Solutia Inc., sampling occurred on the same two days). Six of the EPA sample stations were located approximately 0.25 to 0.5 miles away from the facility property borders; the remaining two sample stations were located approximately 1 mile away. EPA sample stations were located in residential or public access areas. The map in Appendix 1 displays the locations of both Solutia Inc., and EPA air sampling stations. A description of each location is also provided in this appendix. The heights of both the Solutia Inc., and EPA air sample inlets were reported to be approximately two meters [4]. Residential areas are adjacent to the Solutia Inc., sample stations on the west, northwest, north and northeast edges of the Solutia Inc., property.

For sample collection, both Solutia Inc., and EPA used the same type of sampling cartridge (PUF/XAD) that collects both vapor phase and particulate-bound PCBs. In addition, both Solutia Inc., and EPA sampled at approximately the same airflow rates for the same period of time (24 hours). The method of PCB analysis was different. The EPA used a gas chromatograph (GC) with an electron capture detector (ECD), as described in EPA Method TO-4A [2]. Solutia Inc., used a GC mass spectrometer based on the procedures of EPA Method T0-4 and EPA Method 680 [5].

EPA analyzed for Aroclors 1242, 1254, 1221, 1232, 1248, 1260, 1016, and 1268. EPA also analyzed for PCB congener numbers 28, 52, 60, 66, 74, 77, 81, 99, 101, 105, 118, 126, 138, 153, 156, 163, 169, 170, 180, 183, 187, 194, 195, 196, 201, 203, 206, 208, and 209. Solutia Inc., analyzed for PCBs by mono- through deca-PCB congener classes. Detection limits varied by analytical method and according to the volume of air sampled. EPA detection limits were 2.1 nanograms per cubic meter (ng/m^3) to 3.8 ng/m^3 for PCBs by Aroclor and 0.18 ng/m^3 to 0.52 ng/m^3 for PCBs by congener number. Solutia Inc., detection limits for PCBs by congener class was reported as 0.06 ng/m^3 based on a 350 m^3 air sample volume.

Meteorological Data

EPA provided the meteorological data for their two sampling periods. Winds during the first sampling period (June 27-28) were mainly from the southwest with hourly average speeds up to 19 miles per hour (mph) for about 73% of the time. Winds were calm (less than 2 mph) for 27% of the time. Calm winds occurred between 8 pm and 7 am. During the second sampling period (June 29-30), winds were also mainly from the southwest. Wind was from the southwest with hourly average speeds up to 21 mph for 87% of the time. Calm winds occurred from midnight thru 4 am. Heavy rain was recorded from 9 to 10 am on June 29th.

No meteorological data were provided with the Solutia Inc., sample results.

PCB Results by Sample Location

PCBs were detected at all Solutia Inc., sample locations over the 1-year sampling period. Total PCBs were calculated as the sum of levels of each congener class detected. If PCBs were not detected, a value of one-half of the quantitative detection limit was used. Table 1 (Appendix 2) displays a summary of these results by sample station location. Figure 1 (Appendix 3) displays a graphic presentation of these results. Sample location 4 (north) had the highest level of PCBs detected (116 ng/m^3), as well as the highest yearly mean (30.8 ng/m^3) and median (18.9 ng/m^3) concentrations. Sample station location 1 (east) had the lowest annual mean and median concentrations, 5.4 and 4.3 ng/m^3, respectively (maximum concentration: 22.1 ng/m^3).

Figures 2 and 3 (Appendix 3) display the EPA air sampling results by total congeners and by Aroclor 1242. Table 2 (Appendix 2) displays the results of EPA's two-day, off-site PCB sampling. Total PCBs are reported as the sum of congeners detected and as the concentration of Aroclor 1242. If PCBs were not detected, a value of one-half the quantitative detection limit

was used. Neither PCB congeners nor Aroclor 1242 were found at A and H sample stations that were located approximately one mile west and east-northeast, respectively, from the site. In addition, PCBs were not detected at sample station "B" which was located approximately 0.25 miles southwest of the Solutia Inc., property boundary. PCBs were detected at the remaining five locations. The maximum concentration (4.9 ng/m^3 total congeners and 45 ng/m^3 Aroclor 1242) was detected at the station located approximately 0.25 miles northwest (station "D") of the property boundary. On this same date (June 27, 2000), the maximum PCB concentration found in Solutia Inc.'s data was 96.9 ng/m^3, at their north sample station (station 4).

Sample Results by Sample Date

PCBs were detected on each Solutia Inc., sampling date. Figure 4 and Table 3 display the data arranged by sampling date. The highest maximum (116 ng/m^3) and mean (33.8 ng/m^3) values of total PCBs were detected on June 28, 2000. The data indicate a general trend where higher levels of PCBs were generally found in the spring and summer months; the lowest levels were generally detected in the winter months.

PCBs were detected on both days of EPA sampling. When results from the background locations (stations 1 mile from the Solutia Inc., facility) are not included, the average sum of PCB congeners was 0.9 ng/m^3 on June 27th, 2000, and 1.1 ng/m^3 on June 28th. In addition, the Aroclor 1242 concentrations on these two sample dates were 10.3 ng/m^3 and 11.8 ng/m^3, respectively. Table 4 summarizes these results, both with and without background sample results.

Congeners Detected

The mono- through penta-PCB congener classes were commonly detected at all Solutia Inc., sample stations at various times throughout the year. The hexa-chlorinated congener class was commonly detected at the 2-South, 4-North, and 5-Northeast sample stations from April 28 through September 26, 2000 sampling period. It was less commonly detected at the other locations. The hepta-congener class was detected once at the 2-South station (5/21/00); 3 times at the 4-North station (6/27, 6/28, 7/26); and once at the 5-Northeast location (7/26). Figures 5 and 6 display the number of times that hexa- and hepta-congener PCB classes were detected, both by sample station location and by month sampled.

Results of the two-day sampling by EPA found PCB Aroclor 1242 both days at sample locations C, D, and E; the first day at location F; and the second day at location G. PCB congener numbers 28 (tri- congener class); and 74 (tetra-congener class) were detected. Congener numbers 52, 60, 66, 74, 81 (all in tetra-congener class), 101 (penta-congener class), and 156 (hexa-congener class) were reported as "presumptive evidence of presence of material."

Discussion

In general, airborne PCB levels in the U.S. appear to be decreasing over time, with higher levels being detected in urban areas compared to rural locations [3]. For example, in June 1996, atmospheric concentrations of total PCBs measured in urban and rural locations in Baltimore, Maryland, were 0.38-3.36 and 0.02-0.34 ng/m^3, respectively. Table 5 summarizes these data along with other urban area total PCB air concentrations. The EPA PCB mean values and concentration ranges detected in Anniston are higher than those reported in other urban areas.

The Anniston, Calhoun County area is classified as a "metro county (3)" in the rural-urban continuum code that is used as a classification scheme for all U.S. counties [6]. A "metro county (3)" includes counties in metro areas of fewer than 250,000 in population. In Table 5, the counties that include Baltimore, New Brunswick, and Sturgeon Point are all classified as "metro county (0)," which is defined as central counties of metro areas of one million population or more. Using this classification system along with the fact that PCBs levels are generally higher in urban areas, the Anniston area would have been expected to have lower levels of PCBs than the larger and more populated cities displayed in Table 5.

Table 5. PCB Air Concentrations found in EPA and Solutia Inc., samples vs. other U.S. locations [5]

Sample Location, date	Mean (range) PCB Concentrations, ng/m^3*
Anniston, AL, Solutia Inc., samples, Jan 2000-Jan 2001	12.5 (0.03** - 116)
Anniston, AL, EPA samples, June 2000	1.0 (0.2** - 16.2)
Baltimore, MD, urban area, 1996	(0.4-3.4)
Baltimore, MD, rural area, 1996	(0.02-0.3)
New Brunswick, NJ, urban area, 1997	0.5 (0.1-3.2)
Sturgeon Point, NY, urban area, 1997	0.37

*Solutia Inc., values are the sum of PCBs by congener class; all other values are the sum of PCB congeners; therefore, the Solutia Inc., results may not be directly comparable to the other results in the table.
**half of analytical quantitation limit

Because of the two different methods of sample analysis, a direct quantitative comparison of Solutia Inc., results with EPA's is not possible. Solutia Inc., analyses are reported as PCB congener class; EPA results were reported as Aroclor and as PCB congener number. Solutia Inc., detected mono- through hepta-congener classes. EPA detected Aroclor 1242 and congener numbers 28 and 74. In addition, EPA reported the "presumptive evidence" of the presence of more highly chlorinated congeners (penta and hexa). On the two days when both EPA and Solutia, Inc,. sampling occurred, results of the two closest sample stations (Solutia Inc.'s 4-North and EPA's Station D) are roughly comparable. Solutia Inc., data show mono- through hepta-PCB congener classes, with a total PCB concentration detected each day (June 27 and 28)

of 96.9 and 116 ng/m^3. The EPA sampling either detected or found "presumptive evidence" of tri- through penta-PCB congener classes, with a total PCB concentration of 16.2 ng/m^3 on June 27. The EPA June 28 sample results for the same location detected or found "presumptive evidence for tri- and tetra congener classes, with a total PCB concentration of 2.9 ng/m^3. PCBs were detected by both Solutia Inc., and EPA. EPA found PCBs at lower concentrations than Solutia Inc. Solutia Inc., sample locations were on the edge of their property line and EPA sample stations were approximately ¼-mile away from the facility property line. If PCB levels are decreasing with distance from the Solutia Inc., sample stations, this may indicate that the source of PCBs is on or near the Solutia, Inc., property.

The detection of the hexa- and hepta-chlorinated congener PCB classes suggests the presence of Aroclors that are more heavily chlorinated than Aroclor 1242. As an example, hexa-chlorinated congeners make up 0.32 percent of the weight composition of Aroclor 1242, as compared to making up 26.75% of Aroclor 1254 and 43.35% of Aroclor 1260 [3]. The hexa-chlorinated congener class made up approximately 1.6% and 1.4% of the composition of the classes detected in the June 27 and 28 samples at Solutia Inc.'s 4-North location. This indicates the presence of more highly chlorinated Aroclors. Further support for the presence of highly chlorinated congeners is the periodic detection of the hepta-chlorinated PCB congeners. This congener class is only found in Aroclors 1248 through 1268 [3].

Community Health Implications

The number of sampling locations in the existing communities surrounding the Solutia Inc., facility is limited. The sample results at stations located near communities suggest that community exposures via inhalation of PCBs could be occurring. More representative sampling in community areas around the facility would assist in better determining residential exposures to PCBs.

Noncancerous health effects

PCBs have been associated with several adverse noncancerous health effects in humans and animals, including liver, thyroid, dermal and ocular changes, immunological alterations, neurodevelopmental changes, reduced birth weight, and reproductive effects. Studies attempting to show the same health effects in humans that have been observed in animals have generally been inconclusive [3]. In general, some human studies have found associations between PCBs and

1. subtle neurobehavioral effects in children, particularly from pre-natal exposure or exposure during breast-feeding,
2. hepatic (liver) effects in occupationally exposed adults,
3. dermal and ocular effects in occupationally exposed adults and in a population that consumed PCB-contaminated rice oil,
4. subtle immunological susceptibility, particularly in infants exposed during gestation or breast-feeding,
5. reproductive effects, particularly in infants born to mothers who ate contaminated fish [3].

However, one study showed that humans potentially exposed to a dose of 70 – 140 μg/kg/day of PCBs for months to years showed no evidence of impaired health [7].

Cancer

PCBs are known to cause cancer in animals [3]; however, the evidence that PCBs cause cancer in humans is not as clear. The potential for PCBs to cause cancer has been investigated through human studies that have examined both occupational exposures and environmental exposures. Most of the studies that examined environmental exposures used biological levels of PCBs rather than environmental levels (i.e., blood samples instead of air samples). Therefore, it is difficult to evaluate the PCB levels discussed in this document for its potential to cause cancer. However, *occupational* exposures to PCBs (usually at much higher levels than what is found in the environment) have been associated with liver, biliary tract, intestinal, and skin cancer [8-15].

In contrast to human studies, there is stronger evidence that PCBs cause liver and thyroid cancer in animals [16-19], particularly from exposure to PCBs with 60% chlorine (e.g., Aroclor 1260) [20]. In addition, a more recent study showed that all 4 mixtures of Aroclors (Aroclors 1016, 1242, 1254, and 1260) induced liver tumors [21,22]. Based on sufficient evidence of carcinogenicity in animals, PCBs have been classified as a probable human carcinogen by the U.S. Environmental Protection Agency (EPA) and the International Agency for Research on Cancer (IARC), and reasonably anticipated to be a human carcinogen by the National Toxicology Program (NTP).

Average concentrations may represent a more likely scenario for long-term cancer risk exposure, especially when concentrations vary spatially [23], which was the case for the data evaluated in this document. Short-term exposure to carcinogens is an area of considerable debate and research; however, it is generally believed that any exposure factors that are less than what was used for the calculations will significantly decrease the calculated risk (e.g., exposed for a shorter time period; exposed to lower concentrations; exposed less frequently during the time period, etc.).

Child Health Initiative

ATSDR's Child Health Initiative recognizes that the unique vulnerabilities of infants and children demand special emphasis in communities faced with contamination of environmental media. Several studies have reported that low level PCB exposure during fetal or neonatal development can effect the infant's neurobehavioral development [24, 25]. However, several limitations of these studies have been noted: (1) possible exposure to other neurotoxic chemicals besides PCBs (e.g., dioxins, mercury, lead, or organochlorine pesticides) that may have contributed to the effects, (2) inadequate control for confounding socioeconomic variables such as maternal smoking, alcohol, and other drug use, and (3) inadequate control for maternal birth weight and nonspontaneous deliveries [26,27]. In addition to these methodological limitations, different studies have measured different neurobehavioral endpoints, which impede comparisons between studies.

Therefore, these studies suggest, but do not conclusively prove, an association between prenatal or neonatal exposures to PCBs and neurobehavioral and developmental effects in young children. Furthermore, these effects were reported to occur in populations with background exposures to PCBs, so a threshold level has not been defined.

Occupational Health Implications

The National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limit (REL) for airborne PCBs is 1 microgram (ug) per cubic meter of air (1 ug/m^3 or 1,000 ng/m^3). This exposure limit is based on up to a 10-hour workday for a 40-hour workweek. The highest level of PCBs found in the Solutia Inc., 24-hour samples (116 ng/m^3) is approximately one-tenth of the NIOSH REL. This 24-hour sampling was conducted at the edges of the facility property in order to determine if off-site migration of PCBs is occurring. Therefore, the data are not likely to be representative of levels present in areas were employees work. Depending on the PCB source location(s) in relationship to the sample station locations, higher PCB levels may be present at other locations on the Solutia Inc., property.

Until the source(s) of PCBs that are resulting in the air concentrations is/are better defined, it is not known if other occupational exposures are occurring in the community. Occupations involving soil excavation (e.g., power and water line installation) may be resulting in inadvertent employee inhalation exposures to PCBs.

Source of PCBs

The method of sample collection precludes determining if the airborne PCBs are present in the vapor phase or bound to particulate matter (or both). Knowing this would assist in determining whether the concentrations found could be readily absorbed via inhalation of the vapor, or could be trapped in the upper respiratory tract (based on particulate size) and possibly cleared or swallowed. This determination could also assist with finding the source of PCBs and the best method of reducing the airborne levels. Surface soil contamination of PCBs would be suspected if the contaminants were particulate bound. Vapor phase PCBs suggest a surface water or a subsurface source. The fact that the less volatile, more highly chlorinated, congeners are detected more frequently in the warmer seasons suggests that the PCBs detected may be in the vapor phase (increasing temperature would increase volatilization rate of PCBs). If the PCB source contains solvents, this would also increase the likelihood of PCB volatilization. Other information that would assist in determining the source and phase of PCBs includes dates of invasive activities (e.g., excavation) that were/are occurring near air sample stations and meteorological conditions (e.g., precipitation) during sampling periods.

Conclusions

Based on the data reviewed, ATSDR concludes that:

1) *Community members* who reside near the Solutia Inc., facility may be exposed to PCBs via inhalation. Because of the limited air sampling data in residential areas, these potential exposures pose an indeterminate health hazard.

2) PCBs are present in the ambient air on and off of the perimeter of the Solutia Inc., property at higher levels than those found in large U.S. urban areas. Air sampling data in areas where Solutia Inc., current employees are located is not available for review. The existing ambient air PCB data suggest that it is possible that *current Solutia Inc., workers* may be exposed to PCBs while on the Solutia Inc., property. In addition, until the source(s) of PCBs are found, potential PCB exposures to *Anniston-area workers involved in soil excavation* activities pose an indeterminate health hazard.

Recommendations

1) Conduct periodic air sampling for PCBs in residential areas surrounding the Solutia Inc., facility to better determine community exposures.

2) Ensure that current Solutia Inc., employees at this facility are not exposed to PCBs above occupational guidelines. Conducting personal and/or area air sampling at various locations on the facility property during various activities (e.g., indoor office work, outdoor excavation) would assist in determining if occupational exposures to PCBs are occurring.

3) Until the sources of contamination are better characterized, consider environmental testing (e.g., soil, air) for PCBs prior to soil excavation activities in the Anniston area to ensure that occupational exposures do not occur above recommended guidelines.

4) ATSDR will:

   a) Assist in reviewing community air sampling plans and provide input on residential air sampling station locations; and

   b) Continue to review PCB air sampling results to ensure that the trends observed in the 2000-2001 data set do not increase. If ambient air levels of PCBs increase, ATSDR will prepare additional health consultations as necessary.

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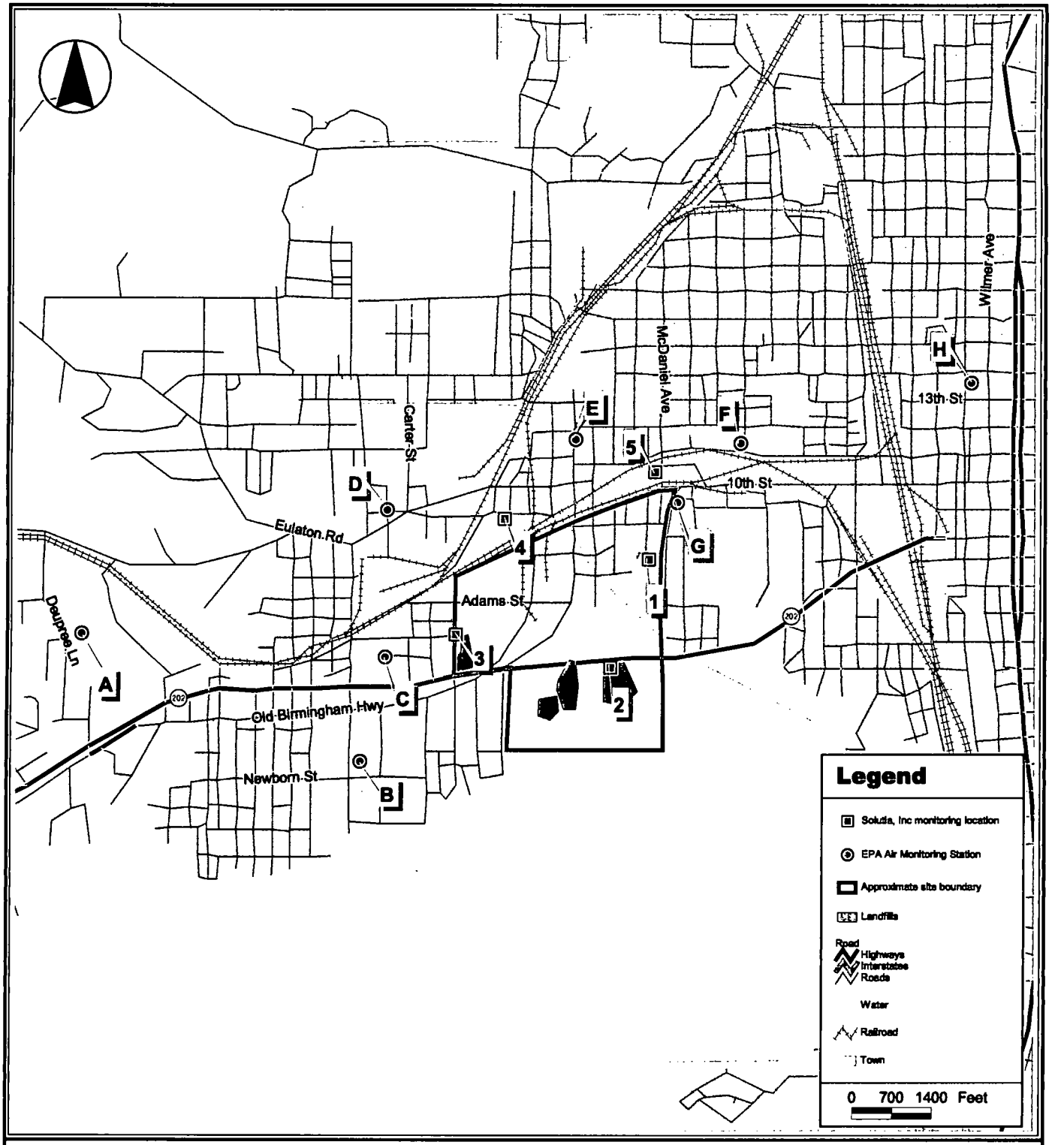
Appendix 1
Air Sample Station Locations

Description of Air Sample Station Locations

Solutia Inc., Air Sample Station Locations, January 2000 through January 2001 [5]			
Sample Location	Station ID	Distance[+]	Location Description
east	1	n/a	adjacent to the Retention Pond situated just north of Highway 202 and just East of the Solutia Inc., facility.
south	2	N/a	near the point of lowest elevation of the South Landfill, approximately 50 fee from eastbound Highway 202
west	3	N/a	atop the West End Landfill, approximately 100 feet from westbound Highway 202
north	4	0.25	approximately 0.25 mile north of the Solutia Inc., facility
northeast	5	0.50	Miller property, located approximately 0.5 miles northeast of the Solutia Inc., facility
[+]estimated distance (miles) from border Solutia Inc., property boundary n/a = within the Solutia Inc., property boundary			

EPA Region IV Sample Station Locations, June 2000 [2]			
Sample Location	Station ID	Distance[+]	Location Description
west	A	1.0	Wellborn High School (background site)
southwest	B	0.25	South Hunter Street
west	C	0.25	Vacant lot between Hunter and 3rd Streets
northwest	D	0.25	Intersection of Ware Street and 9th Street
north	E	0.25	Intersection of Clydesdale Avenue and 12th Street
northeast	F	0.50	Head Start School, 1000 West 12th Street
northeast	G	0.25	Intersection of Lincoln and Zinn Parkways
northeast	H	1.0	Intersection of Nobel and 13th Streets (downtown Anniston)
[+] estimated distance (miles) from border Solutia Inc., property boundary			



Anniston, Alabama PCB Site

Anniston, Alabama

CERCLIS No. ALD004019048

AIR MONITORING LOCATIONS

PAC032102

SAAGIS

Table1. Sum of PCB Congener Class Concentrations by Sample Location.
Solutia Inc. on- property air 24-hr sampling (January 2000 through January 2001)

Sample Location[+]	Map Key/Station Number (appendix 1)	# Samples	PCB Concentration by Congener Class Concentrations (ng/m^3)		
			Range	Mean	Median
east	1	25	0.03* - 22.1	5.4	4.3
east (co-located)	1	13	0.03* - 20.3	5.6	3.2
south	2	24	0.03* - 20.1	6.2	4.9
west	3	26	0.2 – 43.4	10.5	7.8
north**	4	24	0.1 – 116	30.8	18.9
north (co-located)	4	14	0.03* - 44.2	18.9	16.8
northeast**	5	25	0.03* - 34.7	10.3	9.2

[+] refer to legend in attachment for description of sample location
* half of the minimum quantitation limit
**located off of Solutia Inc., property

Table 2. PCB Concentrations: by sum of Congeners and by Arochlor 1242. EPA Off-Site 24-hr Air Sampling, June 27 & 28, 2000

Sample Location[+] (approximate distance from Solutia property)	Map Key/ Station Number (attachment)	# Samples	PCB Congeners (Arochlor 1242) ng/m^3*	
			Range	Mean
west (1.0)	A	2	0.2-0.2** (1 - 1**)	0.2** (1**)
southwest (0.25)	B	2	0.2-0.2** (1 - 1**)	0.2** (1**)
west (0.25)	C	2	0.2** -0.7 (4.6 - 8.8)	0.5 (6.7)
northwest (0.25)	D	2	2.5-4.9 (25 - 45)	3.7 (35)
north (0.25)	E	2	0.7-2.2 (7.3 - 25)	1.5 (16.2)
northeast (0.5)	F	2	0.2** -0.8 (3.3++ & <5.5)	0.5 (4.4++)
northeast (0.25)	G	2	0.2** -0.4 (1** - 5.7++)	0.3 (3.4++)
northeast co-located (0.25)	G	2	0.2* -0.6 (1** - 8.6)	0.4 (4.8)
northeast (1.0)	H	2	0.2-0.2** (1 - 1**)	0.2** (1**)

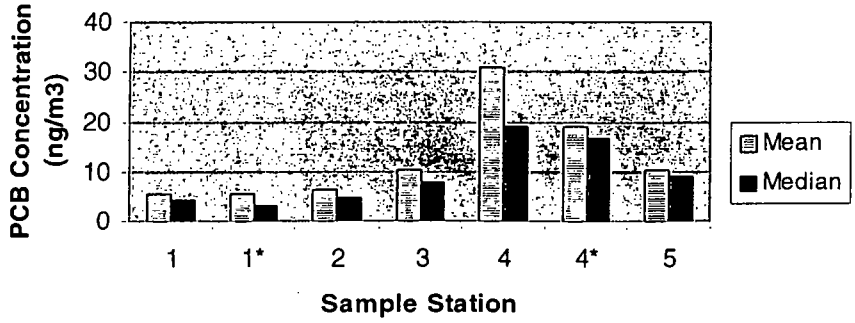
[+]refer to legend in attachment for description of sample location
* levels shown are the sum of PCB congeners and, in parenthesis, levels of PCBs reported as Aroclor 1242
** half of the minimum quantitation limit
++estimated value

Table 3. Sum of PCB Congener Class Concentrations by Sample Date. Solutia Inc. on- property air 24-hr sampling (January 2000 through January 2001)				
Sample Date[+]	# Samples	Total PCB Concentration in air (ng/m^3)–from all sample stations		
		range	mean	median
1/ 25	6	0.03[*] -17.4	3.4	0.4
1/ 26	5	0.6 - 9.7	2.9	1.2
2/ 24	5	0.03[*] - 16.1	5.6	0.4
2/ 28	5	1 - 23.2	7.7	2.8
3/ 27	6	6.6 - 43.5	22.1	21.2
3/ 28	5	6.4 - 37.4	14.2	9.9
4/ 28	5	8.6 - 68.8	29.3	15.6
4/ 29	6	7.5 - 63.5	20	9.6
5/ 20	4	9.8 - 34.7	20.4	18.5
5/ 21	5	16.2 - 27.4	19.9	19.0
6/ 27	7	2.6 - 96.9	22.8	4.6
6/ 28	5	8.8 - 116	33.8	14.9
7/ 25	7	0.5 - 11.5	3.6	2.7
7/ 26	5	2.1 - 77.4	22.3	12.6
8/22	4	0.2 - 6.8	3.2	2.8
8/ 23	6	5.7 - 36.9	15.2	9.2
9/ 27	6	2.8 - 21	9.6	6.4
9/ 28	7	3.8 - 52.3	19.1	10.4
10/25	6	4.3 - 16.5	8.2	5.5
10/26	7	8.8 - 44.2	19.1	13.2
11/27	6	4.0-27.0	12.4	11.2
11/28	7	1.9-27.3	9.9	6.8
12/19	7	0.2 -7.5	2.4	2.1
12/20	6	0.1-5.4	2.1	2.0
1/16 (2001)	7	0.4-8.0	2.8	1.4

Table 3. Sum of PCB Congener Class Concentrations by Sample Date. Solutia Inc. on- property air 24-hr sampling (January 2000 through January 2001)				
Sample Date[+]	# Samples	Total PCB Concentration in air (ng/m^3)–from all sample stations		
		range	mean	median
1/17 (2001)	6	0.03*-2.2	1.0	0.9
[+]= year 2000, unless noted * = half of the minimum quantitation limit				

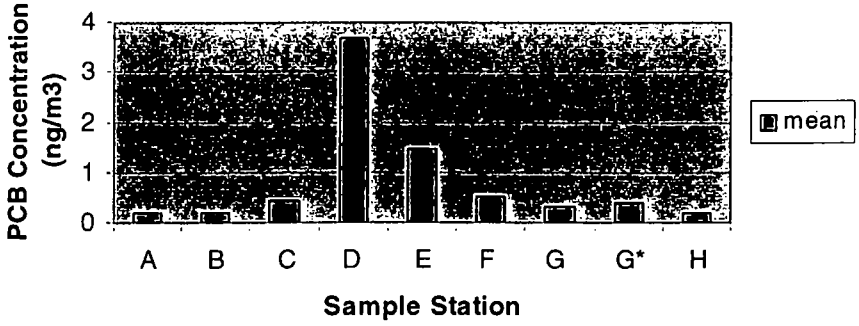
Table 4. EPA Off-Site Air Sampling Sum of PCB Congeners and Arochlor 1242 (ng/m^3)				
All Locations				
Sample Date (2000)	# Samples	PCB Congeners (Arochlor 1242)[+]		
		range	mean	median
6 /27	9	0.2*-4.9 (1* - 45)	0.8 (7.2)	0.2 (1*)
6/ 28	9	0.2*-2.5 (1* - 25)	0.9 (9.1)	0.6 (5.6)
All Locations--*without background samples*				
6 /27	7	0.2*-4.9 (1* - 45)	0.9 (10.3)	0.2 (4.0)
6/ 28	7	0.2*-2.5 (1* - 25)	1.1 (11.8)	0.7 (7.3)
[+] levels shown are the sum of PCB congeners and, in parenthesis, levels of PCBs reported as Aroclor 1242 * half of the minimum quantitation limit				

Figure 1. PCB Concentrations (as sum of all PCB congener classes), Solutia Inc. data



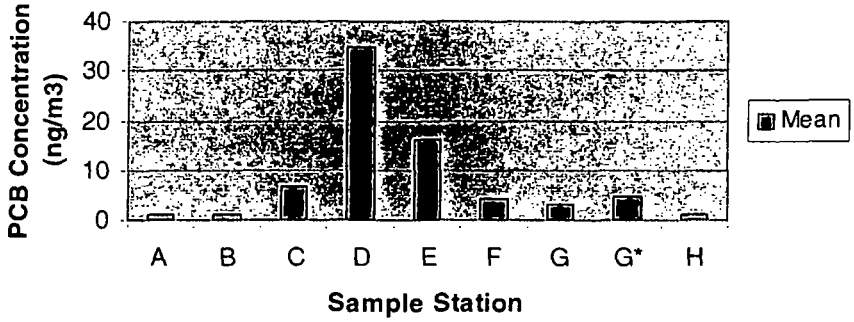
*co-located sample location

Figure 2. PCB Concentrations (as sum of all congener numbers), EPA data



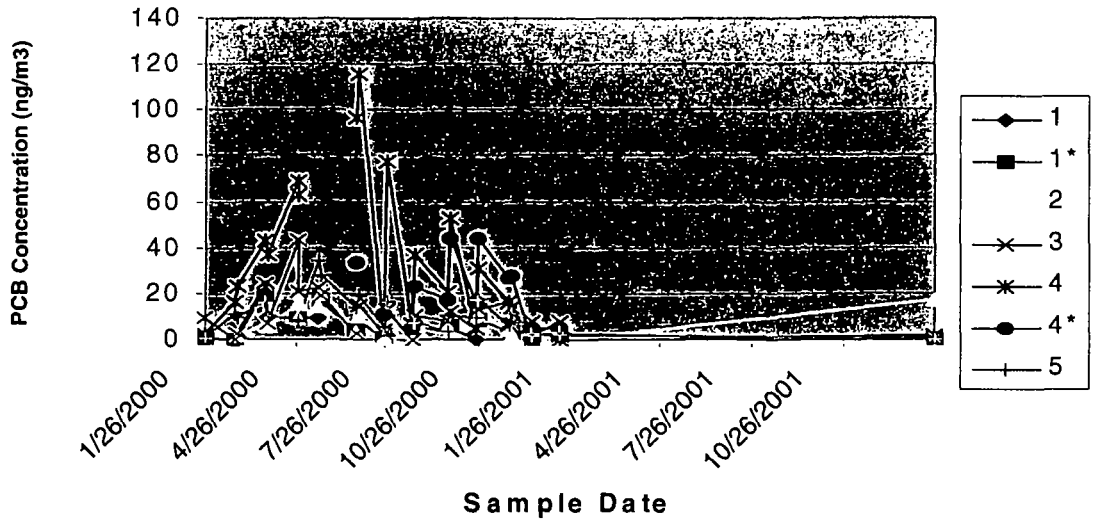
*co-located sample location

Figure 3. PCB Concentration (as Aroclor 1242), EPA data



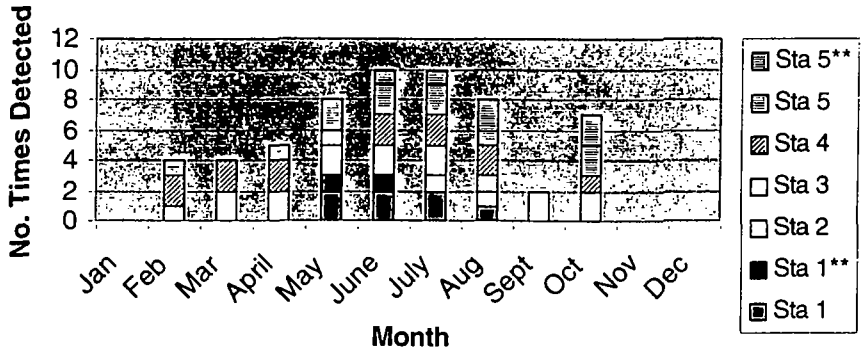
*co-located sample location

Figure 4. PCB Concentrations (as sum of PCB congener classes)



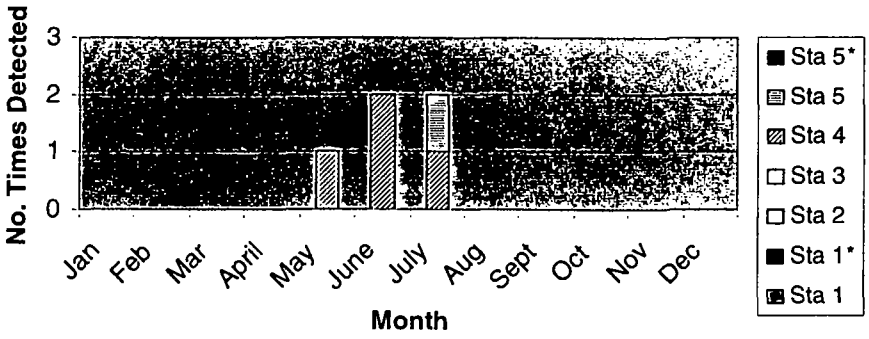
*co-located sample location

Figure 5. Frequency of Hexa-Congener PCB Detection*



*maximum possible frequency per sample station is two times per month
**co-located sample location

Figure 6. Frequency of Hepta-Congener PCB Detection*



*maximum possible frequency per sample station is two times per month
**co-located sample location