

Health Consultation

Results of Exposure Investigation of Dust Sampling in Building 240

ZENECA/CAMPUS BAY, RICHMOND, CONTRA COSTA COUNTY,
CALIFORNIA

EPA FACILITY ID: CAD009123456

DECEMBER 15, 2006

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. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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HEALTH CONSULTATION

Results of Exposure Investigation of Dust Sampling in Building 240

ZENECA/CAMPUS BAY, RICHMOND, CONTRA COSTA COUNTY, CALIFORNIA

EPA FACILITY ID: CAD009123456

Prepared By:

California Department of Health Services
Under a Cooperative Agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

Summary

In April 2006, the Environmental Health Investigations Branch (EHIB) of the California Department of Health Services (CDHS), conducted an exposure investigation (EI) consisting of dust sampling in the Making Waves building (Building 240) on the Zeneca/Campus Bay site (formerly Stauffer Chemical), Richmond, California (1). Making Waves is a youth after school program, which was held in Building 240. The purpose of the exposure investigation was to identify whether there is a potential for exposure to site-related contaminants (pesticides/herbicides and metals) in Building 240.

In June 2006, results of the EI were shared with the staff and parents of students at Making Waves, the Department of Toxic Substances Control (DTSC) Community Advisory Group (CAG) and other stakeholders. The content of the correspondence between CDHS and the stakeholders is the basis of this health consultation (Appendix A). CDHS has a cooperative agreement with the federal Agency for Toxic Substance and Disease Registry (ATSDR), and this health consultation is being forwarded to ATSDR for their concurrence.

Background and Statement of Issue

Stauffer Chemical Company began operations at the site in 1897 with sulfuric acid production. Sulfuric acid production generated a large volume of cinder waste from the roasting of iron pyrite ore. Cinders were deposited into low lying areas on the site over the years of operation. Pyrite cinders are generally acidic and contain high concentrations of metals, primarily arsenic, cadmium, lead, selenium, and zinc. In the 1950s, Stauffer began producing a variety of chemicals including pesticides, herbicides, and superphosphate fertilizer. Stauffer operations continued on the site until 1985. Between 1986 and 1992, the property was transferred between several owners. In 1992, Zeneca, Inc. took over operations on the site. Industrial operations at the site ceased in 1997. In 2002, CSV land developers purchased the 86-acre site from Zeneca, Inc and renamed the property Campus Bay.

Contaminants detected on the Zeneca/Campus Bay site include pesticides, herbicides, metals, volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and petroleum hydrocarbons.

Remedial work was begun on site in 2002. Reportedly, during this remediation significant amounts of dust were generated, which blew towards building 240. The prevailing wind direction blows from the southwest towards the northeast. The duration of these activities varied from weeks to months. Prior to 2005, air monitoring (if any) was not adequate to evaluate contaminant levels in dust. Furthermore, the building is a former administrative building that remained on site after Zeneca ceased operations. Therefore, it is also possible for dust and soil to have impacted the building during historical site operations.

Building 240 on the Zeneca/Campus Bay site is temporarily being used for the youth after school/weekend program Making Waves. The Making Waves program held in building 240 relocated to a new facility in September 2006. Approximately 250

students participate in the Making Waves after school program. There was concern about whether students of Making Waves were coming into contact with site-related contaminants in dust, particularly pesticides/herbicides.

In March 2006, CDHS submitted a proposal to ATSDR for an EI of Building 240. CDHS developed a workplan/protocol, which was reviewed and approved by ATSDR (1). DTSC reviewed and concurred with the workplan/protocol as well.

The primary objective of the EI was to identify whether there is a potential for exposure to site-related contaminants, in particular if pesticides/herbicides and metals are present in dust in Building 240. This information was used to determine whether specific remedial actions (cleaning of the building, discontinue use of the building) were warranted.

In April 2006, CDHS collected vacuum dust and surface wipe samples from Building 240 on the Zeneca site (Appendix A, Table 1). The samples were submitted to Southwest Research Institute for analyses.

Discussion

To assess whether actions were needed to reduce exposure to contaminants in indoor dust, CDHS compared contaminant concentrations in dust to site-specific health comparison values calculated for dust (1). Health comparison values are specific contaminant concentrations that were used to screen contaminants in dust for further evaluation.

The dust sampling results for Building 240 (Making Waves) have been reviewed by CDHS and DTSC. As expected, some contaminants were detected in dust samples. None of the pesticides or metals detected exceed health comparison screening values calculated for dust. Attached is a table summarizing the pesticide and metal results for the vacuum dust and dust wipe samples (Appendix A, Table 2).

CDHS was informed that during the lab analyses the chemist noticed “peaks” that could be associated with PCBs (polychlorinated biphenyls). (PCB analysis was not part of the original workplan.) CDHS instructed the lab to run PCB congener-specific analysis. Each congener has two or more chlorine atoms located at specific sites on the PCB molecule. The PCB congener-specific analyses measure the concentration of each congener in the sample.

Using the approach outlined in the EI protocol, CDHS developed a dust health comparison value for PCBs to use as a comparison in evaluating the amount of PCBs found in the dust. Instead of having a health comparison value for each congener, CDHS used the TEF (toxic equivalent factor) approach to obtain a single health comparison value for PCBs in the dust ($0.04 \mu\text{g}/\text{m}^2$). The TEF approach compares PCB congeners to the relative toxicity of dioxin (2,3,7,8-tetracholordibenzo-*p*-dioxin), since some PCB congeners act/ behave like dioxin in the body.

The laboratory data sheets for the PCBs can be found in Appendix B. The data sheets show the PCB congener concentrations, converted data ($\mu\text{g}/\text{m}^2$), the TEFs, and the TECs (toxic equivalent concentrations), which are calculated by multiplying the TEF by PCB congener concentration and sum of the TECs. The sum/total TEC is the value compared with the PCB health comparison value for dust ($0.04 \mu\text{g}/\text{m}^2$). Attached is a summary table showing the sum/total TEC concentrations and the health comparison value for PCBs in the dust (Appendix A, Table 3).

None of the dust samples exceed health comparison values derived for PCBs in dust.

It is worth noting that while PCBs are a site related contaminant, they are often found in older buildings. Prior to 1977, PCBs were used in the manufacture of caulking used to seal joints around windows and between masonry joints.

On the basis of these data, CDHS concludes students and staff of Making Waves are not being exposed to site-related contaminants or PCBs in dust at levels of health concern. No further action is needed.

Children's Health Considerations

CDHS and ATSDR recognize that, in communities with contaminated water, soil, air, or food (or all of these combined, depending on the substance and the exposure situation), infants and children can be more sensitive than adults to chemical exposures. This sensitivity results from several factors: 1) children might have higher exposures to environmental toxins than adults because, pound for pound of body weight, children drink more water, eat more food, and breathe more air than adults; 2) children play outdoors close to the ground, which increases their exposure to toxins in dust, soil, surface water, and ambient air; 3) children have a tendency to put their hands in their mouths, thus potentially ingesting contaminated soil particles at higher rates than adults; some children even exhibit an abnormal behavior trait known as "pica," which causes them to ingest non-food items, such as soil; 4) children are shorter than adults, which means they can breathe dust, soil, and vapors close to the ground; 5) children's bodies are rapidly growing and developing, thus they can sustain permanent damage if toxic exposures occur during critical growth stages; and 6) children and teenagers more readily than adults can disregard no trespassing signs and wander onto restricted property. The purpose of this EI was to address potential exposure to children.

Conclusions

There is no current health hazard to children from exposure to contaminants in dust from Building 240 on the Zeneca site.

Recommendations

No recommendations for further action are required for building 240.

Public Health Action Plan

The Public Health Action Plan (PHAP) for this site contains a description of actions taken, to be taken, or under consideration by ATSDR and CDHS or others at and near the

site. The purpose of the PHAP is to ensure that this health consultation not only identifies public health hazards, but also provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment. The first section of the PHAP contains a description of actions completed and ongoing. The second section is a list of additional public health actions that are planned for the future.

Actions Completed

- CDHS responded to community concern regarding potential exposure to Making Waves students from contaminants in dust in Building 240.
- CDHS worked with making Waves administrators in communicating results of the EI to staff and parents.
- DTSC ordered Making Waves to relocate the program due to an incident where children were seen outside of B-240 in an area designated to be off-limits to the students of Making Waves. (August 2006)

Ongoing Actions

- CDHS is conducting public health activities at the Zeneca/Campus Bay site.

Actions Planned

- CDHS will release a public health assessment in early 2007.

References

1. California Department of Health Services. Exposure Investigation Protocol Dust Sampling in Building 240, Zeneca/Campus Bay, Richmond, Contra Costa County, California. 2006 Apr.

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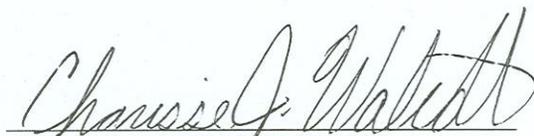
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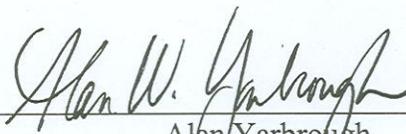
This Public Health Consultation **Results of Exposure Investigation of Dust Sampling in Building 240, Zeneca/Campus Bay, Richmond, CA** was prepared by the California Department of Health Services under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was initiated. Editorial review was completed by the Cooperative Agreement partner.



Charisse Walcott

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Division of Public Health Assessment and Consultation
Agency for Toxic Substances and Disease Registry

The Division of Health Assessment and Consultation, ATSDR, has reviewed this PHA and concurs with the findings.



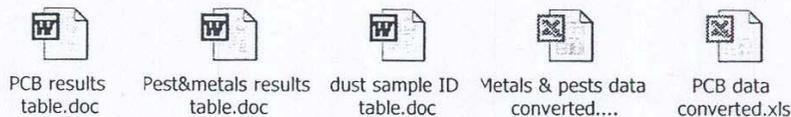
Alan Yarbrough

Cooperative Agreement Team Leader
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Appendix A
(Correspondence dated June 1, 2006)

Barreau, Tracy (DHS-EHIB)

From: Barreau, Tracy (DHS-EHIB)
Sent: Thursday, June 01, 2006 12:53 PM
To: Doug Mosteller (E-mail); Barbara Cook (E-mail); Diane Fowler (E-mail); Kimi Klein (E-mail); Lynn Nakashima (E-mail); Nancy Cook (E-mail); 'RNahas@rafnah.com'; 'akasendorf@sbcglobal.net'; Brunner, Wendel (Contra Costa); 'cbeed8@hotmail.com'; 'celeste_crystal2002@yahoo.com'; 'dandiann@comcast.net'; 'dongja@berkeley.edu'; 'eblighting@sbcglobal.net'; 'gathogowa@yahoo.com'; 'gayle@betterrichmond.net'; 'genser@genserandwatkins.com'; 'henryc11@prodigy.net'; 'im2031@aol.com'; 'jeanrab@value.net'; 'jhrctr@sbcglobal.net'; 'johnz@mahays.com'; 'mlp@cityvisions.com'; 'pablomm@comcast.net'; 'paparick159@sbcglobal.net'; 'ron_berry@ci.richmond.ca.us'; 'sherrybp@pacbell.net'; 'slinsley@centralsan.dst.ca.us'; 'steve_duran@ci.richmond.ca.us'; 'tarnelabbott@comcast.net'; 'wldotson@aol.com'
Cc: Orozco, Rubi (DHS-EHIB); Underwood, Marilyn (DHS-EHIB); Rojas, Tivo (DHS-EHIB); Mona Shum (E-mail)
Subject: Dust sampling results for Building 240/Making Waves



Good Day All:

The dust sampling results for Building 240 (Making Waves) have been reviewed by CDHS and DTSC. As expected, some contaminants were detected in dust samples. **None of the pesticides or metals detected exceeds health comparison screening values calculated for dust.** Attached is a table summarizing the pesticide and metal results for the vacuum dust and dust wipe samples.

CDHS was informed that during the lab analyses the chemist noticed "peaks" that could be associated with PCBs (polychlorinated biphenyls). (PCB analysis was not part of the original workplan.) CDHS instructed the lab to run PCB congener-specific analysis. Each congener has two or more chlorine atoms located at specific sites on the PCB molecule. The PCB congener-specific analyses measure the concentration of each congener in the sample.

As was explained in the workplan for the targeted pesticides and metals, we developed a dust health comparison value for PCBs to use as a comparison in evaluating the amount of PCBs found in the dust. Instead of having a health comparison value for each congener, we used the TEF (toxic equivalent factor) approach to obtain a single health comparison value for PCBs in the dust ($0.04 \mu\text{g}/\text{m}^2$). The TEF approach compares PCB congeners to the relative toxicity of dioxin (2,3,7,8-tetracholordibenzo-*p*-dioxin), since some PCB congeners act/ behave like dioxin in the body.

We have attached the laboratory data sheets for the PCBs. The data sheets show the PCB congener concentrations, converted data ($\mu\text{g}/\text{m}^2$), the TEFs, the TECs (toxic equivalent concentrations), which are calculated by multiplying the TEF by PCB congener concentration and sum of the TECs. The sum/total TEC is the value compared with the PCB health comparison value for dust ($0.04 \mu\text{g}/\text{m}^2$). Attached is a summary table showing the sum/total TEC concentrations and the health comparison value for PCBs in the dust.

None of the dust samples exceed health comparison values derived for PCBs in dust.

It is worth noting that while PCBs are a site related contaminant, they are often found in older buildings. Prior to 1977, PCBs were used in the manufacture of caulking used to seal joints around windows and between masonry joints.

All the dust sampling data will be summarized and interpreted in a final report as part of the health assessment process.

On the basis of these data, CDHS concludes students and staff of Making Waves are not being exposed to site-related contaminants or PCBs in dust at levels of health concern. No further action is needed.

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Table 1. Description of Vacuum Dust and Wipe Samples Collected from Building 240, Zeneca/Campus Bay, Richmond, CA

Sample Identification	Sample Type	Surface Dimensions	Surface Area (m²)	Location Description
V1-01	Vacuum dust	3 x 3 (meters)	9	Open area / walk way outside room 28, 1 st floor
V1-02	Vacuum dust	1.5 x 3	4.5	Open area outside room 40, 1 st floor
V1-03	Vacuum dust	3 x 3	9	Open area between rooms 36-38 and room 45, 1 st floor
V1-04	Vacuum dust	3 x 3	9	Open area outside rooms 61-63, 1 st floor
V2-05	Vacuum dust	1.5 x 3	4.5	Open area outside room 202, 2 nd floor
V1-06	Vacuum dust (blind split of V1-01)	3 x 3	9	Blind split of V1-01
W1-01	Surface wipe	5.5 x 76.5 (inches) 0.139 x 1.94 (meters)	0.27	Window sill in room 64A, 1 st floor
W1-02	Surface wipe	28 x 12 (inches) 0.71 x 0.30 (meters)	0.21	File cabinet in computer lab adjacent to room 45, 1 st floor
W2-03	Surface wipe	12 x 36 (inches) 0.30 x 0.91 (meters)	0.27	Desk top outside room 207, 2 nd floor
W1-04	Surface wipe	12 x 36 (inches) 0.30 x 0.91	0.24	Table top in room 106, 1 st floor
W1-05	Surface wipe	8 x 48 (inches) 0.20 x 1.2 (meters)	0.27	Window sill in room 16, 1 st floor
WB-01	Filed blank - wipe	Not applicable		

m² = square meters

Note: Three separate collocated wipes samples were collected at each location in order to conduct analysis of selected contaminants of concern. Conversion from inches to meters = inches/39.4 (conversion factor)

Table 2. Results of Surface Wipe and Vacuum Dust Samples Collected in Building 240, Zeneca/Campus Bay, Richmond, California

Surface Wipe and Vacuum Dust Samples Collected and Health Comparison Values ($\mu\text{g}/\text{m}^2$)												
Dust Health Comparison Values NC=noncancer C=cancer	DDD	DDE	DDT	Dieldrin	Molinate	Toxaphene	Arsenic	Cadmium	Lead	Mercury	Selenium	Zinc
	5,000 C	3,500 C	3,600 NC 3,000 C	420 NC 74 C	17,000 NC	8,500 NC 1100 C	2,200 NC 108 C	1,800 NC 1,100 C	430 NC	2,700 NC	46,000 NC	2,700,000 NC
Sample I.D.												
W1-01	<0.15	<0.15	<0.15	<0.15	<0.59	<7.41	48.9	2.96	69.3	2.52	2.74	351
W1-02	<0.19	<0.19	<0.19	<0.19	<0.76	<9.52	0.52	2.86	20.0	0.62	0.38	114
W1-04	<0.15	<0.15	<0.15	<0.15	<0.59	<7.41	0.26	0.15	17.4	0.07	0.11	67.4
W1-05	<0.17	<0.17	<0.17	<0.17	<0.67	<8.33	0.33	0.67	16.7	0.25	0.25	55.0
W2-03	<0.15	<0.15	<0.15	<0.15	<0.59	<7.41	0.19	0.07	13.3	0.04	0.11	52.2
V1-01	<0.004	<0.004	<0.004	<0.004	<0.016	<0.194	1.59	0.12	3.32	0.16	4.68	38.4
V1-02	<0.010	<0.010	0.018	<0.010	<0.041	<0.513	3.53	27.1	24.6	0.28	1.29	296
V1-03	<0.021	<0.021	0.038	<0.021	<0.083	<1.043	12.9	4.80	59.6	0.90	1.79	365
V1-03 (duplicate)	<0.021	<0.021	0.030	<0.021	<0.083	<1.037	13.8	1.32	55.9	1.16	2.53	423
V1-04	<0.003	<0.03	<0.003	<0.003	<0.013	<0.162	0.36	1.79	10.7	0.03	0.39	61.4
V1-06	<0.004	<0.004	0.004	<0.004	<0.017	<0.207	0.86	0.26	3.72	0.13	1.58	40.4
V2-05	<0.007	<0.007	0.008	<0.007	<0.029	<0.364	2.51	0.52	6.27	0.08	8.14	93.8

$\mu\text{g}/\text{m}^2$ = micro grams per square meter

< indicates the contaminant was not detected at the laboratory detection limit

DDD = p,p'-Dichlorodiphenyl dichloroethane

DDE = p,p'-Dichlorodiphenyldichloroethylene

DDT = p,p'-Dichlorodiphenyltrichloroethane

Table 3. Summary of Results for Polychlorinated Biphenyl (PCB) Analyses of Surface Wipe and Vacuum Dust Samples Collected in Building 240, Zeneca/Campus Bay, Richmond, CA

Sample ID	Total Toxic Equivalent Concentration ($\mu\text{g}/\text{m}^2$)	Dust Health Comparison Value ($\mu\text{g}/\text{m}^2$)
W1-01	0.004	0.04
W1-02	0.00004	0.04
W1-04	<0.03	0.04
W1-05	0.000008	0.04
W2-03	<0.03	0.04
V1-01	0.000001	0.04
V1-02	0.000008	0.04
V1-03	0.000003	0.04
V1-03 (duplicate)	0.000003	0.04
V1-04	0.0000008	0.04
V1-06	0.0000007	0.04
V2-05	0.0000003	0.04

$\mu\text{g}/\text{m}^2$ = micro grams per square meter

Appendix B
(Laboratory Data Sheets and Conversions)

Southwest Research Institute

PCB Congener Analysis Data Sheet

Client ID: V1-01

Project: 11817.08.006

Extraction date: 04/25/2006

SwRI ID: 277020

Client: Impact Assessment, Inc.

Sample weight (g): 0.223

Cleanup Surrogate

Sample Area= 9m2

Matrix: Dust

Extract volume (mL): 0.4

Recovery, % ###

Dust mass = 0.39g

Data files: Y0510610

BZ No.	Target Analyte	Dilution Factor	GC/MS (ng/mL)	Result (ng/g)	Result (ug/m2)	TEF	Toxic equivalent concentration (TEC) (ug/m2)
8	2,4'-Dichlorobiphenyl	1	<10	<17.9	<0.0008		
18	2,2',5'-Trichlorobiphenyl	1	18.5	33.1	0.0014		
28	2,4,4'-Trichlorobiphenyl	1	32.3	57.9	0.0025		
44	2,2',3,5'-Tetrachlorobiphenyl	1	38.5	69.1	0.0030		
52	2,2',5,5'-Tetrachlorobiphenyl	1	89.5	160.4	0.0070		
66	2,3',4,4'-Tetrachlorobiphenyl	1	22.9	41.1	0.0018		
77	3,3',4,4'-Tetrachlorobiphenyl	1	<10	<17.9	<0.0008	0.0001	
81	3,4,4',5'-Tetrachlorobiphenyl	1	<10	<17.9	<0.0008	0.0001	
101	2,2',4,5,5'-Pentachlorobiphenyl	1	133.1	238.8	0.0103		
105	2,3,3',4,4'-Pentachlorobiphenyl	1	<10	<17.9	<0.0008	0.0001	
114	2,3,4,4',5-Pentachlorobiphenyl	1	<10	<17.9	<0.0008	0.0005	
118	2,3',4,4',5-Pentachlorobiphenyl	1	121.1	217.2	0.0094	0.0001	9.41E-07
123	2',3,4,4',5-Pentachlorobiphenyl	1	<10	<17.9	<0.0008	0.0001	
126	3,3',4,4',5-Pentachlorobiphenyl	1	<10	<17.9	<0.0008	0.1	
128	2,2',3,3',4,4'-Hexachlorobiphenyl	1	<10	<17.9	<0.0008		
138	2,2',3,4,4',5'-Hexachlorobiphenyl	1	152.2	273.1	0.0118		
153	2,2',4,4',5,5'-Hexachlorobiphenyl	1	125.0	224.3	0.0097		
156	2,3,3',4,4',5-Hexachlorobiphenyl	1	<10	<17.9	<0.0008	0.0005	
157	2,3,3',4,4',5'-Hexachlorobiphenyl	1	<10	<17.9	<0.0008	0.0005	
167	2,3',4,4',5,5'-Hexachlorobiphenyl	1	<10	<17.9	<0.0008	0.0000	
169	3,3',4,4',5,5'-Hexachlorobiphenyl	1	<10	<17.9	<0.0008	0.01	

170	2,2',3,3',4,4',5-Heptachlorobiphenyl	1	17.6	31.5	0.0014	0.0001	1.37E-07
180	2,2',3,4,4',5,5'-Heptachlorobiphenyl	1	27.1	48.6	0.0021	0.00001	2.11E-08
187	2,2',3,4',5,5',6-Heptachlorobiphenyl	1	17.5	31.4	0.0014		
189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	1	<10	<17.9	<0.0008	0.0001	
195	2,2',3,3',4,4',5,6-Octachlorobiphenyl	1	<10	<17.9	<0.0008		
206	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	1	<10	<17.9	<0.0008		
209	Decachlorobiphenyl	1	<10	<17.9	<0.0008		
					Sum TECs		1.10E-06
Data Reporting Qualifiers							
< Analyte not detected. Nominal DL = lowest standard							
B Analyte present in laboratory blank for the batch. Value not blank subtracted.							
C Analyte confirmed by GC/MS full scan							
E Analyte amount is elevated due to interference peak							
F Detection limit raised to size of false interfering peak							
G Imprecise quantification: continuing calibration drift exceeds 40%							
J Imprecise quantification: amount below lowest standard							
Conversion for vacuum dust (ng/g to ug/m2): CVD - concentration in vacuum dust (ug/kg) CF - conversion factor 0.001 (1kg/1000g)							
(CVD)(DM)(CF)/SA DM - sample dust mass (g) SA - sample area (m2) (note:ng/g = ug/kg)							
Toxic equivalent concentration = congener concentration (ug/m2)(TEF) TEF = Toxic equivalent factor							

Pesticides

Concentration ng/wipe (values not detect above MDL in italics)									
	4,4'-DDD	4,4'-DDE	4,4'-DDT	Dieldrin	Molinate	Toxaphene	Sample area m2		
277026 W1-01	40	40	40	40	160	2000	0.27		
277027 W1-02	40	40	40	40	160	2000	0.21		
277028 W1-04	40	40	40	40	160	2000	0.27		
277029 W1-05	40	40	40	40	160	2000	0.24		
277030 W2-03	40	40	40	40	160	2000	0.27		
Concentration in vacuum dust ng/g (values not detect above MDL in italics)									
									Dust mass - g
277020 V1-01 (nd)	90	90	90	90	359	4484	9	0.39	
277021 V1-02	40	40	68	40	159	1992	4.5	1.16	
277022 V1-03	40	40	72	40	158	1976	9	4.75	
277022 Dup V1-03	39	39	56	39	157	1965	9	4.75	
277023 V1-04	56	56	56	56	225	2809	9	0.52	
277024 V1-06	106	106	110	106	426	5319	9	0.35	
277025 V2-05	80	80	84	80	320	4000	4.5	0.41	
Concentration in wipe samples ug/m2 (values not detect above MDL in italics)									
277026 W1-01	0.15	0.15	0.15	0.15	0.59	7.41			
277027 W1-02	0.19	0.19	0.19	0.19	0.76	9.52			
277028 W1-04	0.15	0.15	0.15	0.15	0.59	7.41			
277029 W1-05	0.17	0.17	0.17	0.17	0.67	8.33			
277030 W2-03	0.15	0.15	0.15	0.15	0.59	7.41			
Conversion for wipe samples: (CW)(CF)/(SA)									
CW=concentration in wipe		CF= conversion factor - 0.001 (1ug/1000ng)							
SA= sample area (m2)									
Concentration in vacuum samples ug/m2									
277020 V1-01	0.004	0.004	0.004	0.004	0.016	0.194			
277021 V1-02	0.010	0.010	0.018	0.010	0.041	0.513			
277022 V1-03	0.021	0.021	0.038	0.021	0.083	1.043			
277022 Dup V1-03	0.021	0.021	0.030	0.021	0.083	1.037			
277023 V1-04	0.003	0.003	0.003	0.003	0.013	0.162			
277024 V1-06	0.004	0.004	0.004	0.004	0.017	0.207			
277025 V2-05	0.007	0.007	0.008	0.007	0.029	0.364			
Conversion for vacuum dust:									
(CVD)(DM)(CF)/SA				CVD - concentration in vacuum dust (ug/kg)			CF - conversion factor 0.001 (1kg/1000g)		
				DM - dust mass (g)			SA - sample area (m2)		
note: ng/g = ug/kg									
Note: detected contaminants in bold									