



Exhibit D

Agency for Toxic Substances
and Disease Registry
Atlanta GA 30333

January 22, 1999

Ms. Anna Walker
Alaska Department of Transportation
& Public Facilities
P.O. Box 196900
Anchorage, AK 99519

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Dear Ms. Walker:

Enclosed please find a copy of the January 19, 1999 health consultation on the following site prepared by the Alaska Department of Health and Social Services, Division of Public Health, Epidemiology Section, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR).

ANIAK WHITE ALICE COMMUNICATION - SCHOOL FACILITY
ANIAK, BETHEL COUNTY, ALASKA
CERCLIS NO. AK0001383827

If you have any questions, you may call Douglas Gouzie, our technical project officer, at (404) 639-0603.

Sincerely yours,

Max M. Howie, Jr.
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

Aniak Middle School

ANIAK WHITE ALICE COMMUNICATION - SCHOOL FACILITY

ANIAK, BETHEL COUNTY, ALASKA

CERCLIS NO. AK0001383827

JANUARY 19, 1999

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

WACS 2487

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

Aniak Middle School

ANIAK WHITE ALICE COMMUNICATION - SCHOOL FACILITY

ANIAK, BETHEL COUNTY, ALASKA

CERCLIS NO. AK0001383827

Prepared by:

Alaska Department of Health and Social Services
Division of Public Health, Epidemiology Section
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

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Overview

This document describes an exposure investigation conducted by the State of Alaska Epidemiology Section to assess exposure of students, faculty, and staff to polychlorinated biphenyls (PCBs) at the Aniak Middle School site in Aniak, Alaska. Elevated levels of PCBs had been documented in the soil outside the school, and on some floor and hallway surfaces inside the school. During this exposure investigation, serum of selected students, faculty, and staff was analyzed for PCB content. No PCB congeners were detected in the serum of any of the children in this investigation. Trace quantities of several PCB congeners were detected in the serum of two adult males from the maintenance staff, but it is uncertain whether their PCB exposures were related to the Aniak Middle School site.

Background

The U.S. Air Force constructed a White Alice Communications Site (WACS) in Aniak, Alaska in 1956 as part of the Distant Early Warning (DEW) system of the 1950's. Military operations at WACS in Alaska typically included the use of hazardous substances such as petroleum products, polychlorinated biphenyls (PCBs), solid wastes, heavy metals and solvents. PCB contaminated soil is commonly found outside the entrances to generator rooms at these sites.

In 1979, the U.S. Air Force deactivated the Aniak WACS and transferred occupancy rights to the Kuspuk School District. The old operations building was renovated for civilian use as a public vocational school, which was later converted to a middle school in 1995. A new high school was constructed adjacent to the old operations building. During the renovation work in 1979 and 1980, transformer oils containing PCBs were drained or spilled onto the floors of the old operations building, and onto the ground outside the building. Hazardous materials were placed into drums that were moved to various locations on the property, where additional spillage reportedly occurred. Most of those drums were ultimately shipped to a disposal facility out-of-state. Soil cleanup projects were undertaken in 1981 and again in 1983, during which approximately 80 tons of PCB contaminated soil were shipped to a disposal site along with numerous drums of other wastes. A sealant was applied to the floor of the old generator building (now the middle school wood shop) in 1981, which was subsequently improved in 1983. The U.S. Army Corps of Engineers (ACOE) evaluated the Aniak WACS under its Formerly Used Defense Site (FUDS) program and determined in 1991 that no further action was needed at the site.

Previous Alaska Division of Public Health Activities

In September 1983, the State of Alaska Epidemiology Section (DHSS Div. of Public Health) performed an investigation to determine whether local workmen involved in site renovation during the fall of 1979 and the winter of 1980 had been exposed to PCBs at levels of health concern [1]. During building renovation the workers were exposed to large spills of antifreeze and PCB-containing transformer fluid, and did not wear appropriate protective equipment. At least one worker was engaged in the unsafe practice of mouth siphoning of fluid from the transformers. Despite the potential for large PCB exposures from work activities, elevated levels of PCBs were not observed in the worker's serum four years later. (Due to the biological persistence of these compounds in human tissues, significant PCB exposures would probably have

been detectable in serum even after a four-year delay in testing.) PCB levels in serum for the seven individuals tested ranged from 3 - 12 parts per billion (ppb) as quantitated against aroclor 1260 standards. All results were lower than the upper limit of expected values for PCBs (20 ppb) in human serum based on a study of Michigan residents conducted during 1977-1982 [2]. Medical histories obtained from each of the individuals failed to elicit any history of acute or chronic medical problems which could be related to or associated with exposure to PCBs as a result of site renovation activities.

In 1995, the State of Alaska Dept. of Environmental Conservation (DEC) was informed that abandoned military drums containing waste remained at the WACS. Soil around the drums was contaminated. Site investigations were conducted by DEC, ACOE, and the U.S. Environmental Protection Agency (EPA). They documented that significant contamination was still present at the site [3]. The ACOE inventoried 49 drums containing suspected used petroleum products. Soil sampling revealed that high levels of PCBs remained outside the entrance to the former generator room (the current middle school wood shop). Levels of PCB-1260 in soil outside the school were as high as 330 parts per million (ppm). All soil samples from the gravel pad at the southeast side of the middle school contained PCB 1260 at levels significantly above the Toxic Substances Control Act (TSCA) cleanup guidance level of 10 ppm.

Based on this information, wipe samples were collected for PCBs within the school to determine whether the contaminants were present inside the building. The wipe samples revealed that elevated levels of PCBs were present on the floors of the wood shop and some hallways of the middle school [4]. The two highest wipe samples revealed a concentration of 1,147 mg/100 cm² on the floor of the maintenance shop entrance, and 512 mg/100 cm² on the wood shop floor. The U.S. EPA Guidance on Remedial Actions for Superfund Sites with PCB Contamination (August 1990) recommends a clean-up criteria for indoor surfaces with unrestricted access of 10 mg/100 cm².

In order to assess the public health implications of the PCB levels found at the school, this exposure investigation was conducted. The primary objective of the investigation was to determine whether serum levels of PCBs were elevated among students and staff at the school.

Exposure Investigation Methods

A nurse epidemiologist and an environmental toxicologist from the state Epidemiology Section visited Aniak on December 15 - 16, 1997, to conduct the exposure investigation. Interviews were conducted with school district personnel, faculty, students and staff of the middle school in order to identify persons with the likelihood of greatest PCB exposure. Currently, approximately 40 students are enrolled at the school.

Recruitment efforts were targeted towards members of groups at greatest risk for PCB exposure, but the invitation to participate was extended to any interested persons affiliated with the school. Groups at high risk were considered to include students who had taken wood shop at the school, faculty that had occupied areas that had greater PCB contamination such as the wood shop, and maintenance and janitorial staff that had spent significant time cleaning or working in areas of greater contamination such as the wood and maintenance shops. Efforts were made to recruit

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some family members who were not affiliated with the school for comparative purposes, such as the younger siblings of tested wood shop students and the spouses of maintenance staff.

The exposure investigation ultimately consisted of eighteen participants: five students who had taken wood shop at the middle school for at least one year, younger siblings of three of the student subjects who had not yet attended the middle school, one faculty member, seven present or recent members of the maintenance or janitorial staff, and two spouses of maintenance or janitorial staff.

Investigation participants reported to the local health clinic (the Clara Morgan Clinic of the Yukon-Kuskokwim Health Corporation) for evaluation. Evaluations consisted of a short interview, the measurement of height and weight, and the procurement of a 10 cc blood sample. Duplicate blood samples were obtained from five participants, and were submitted in a blind analysis to the analytical laboratory for quality assurance purposes.

Blood was drawn by venipuncture into sterile red-top Vacutainer tubes with no additives, which were then placed upright for 20 to 30 minutes to allow the blood to clot. Blood in the tubes was then centrifuged at 1000xg for 15 minutes. Separated serum was transferred to two glass vials (4-5 ml for PCB analysis and 2 ml for lipid analysis) and conventionally frozen upright. Samples were shipped frozen on dry ice to the Centers for Disease Control analytical laboratory in Atlanta, GA, by Federal Express on December 17, 1997.

Chemical analysis was performed using the methods of Brock et al. [5]. To prepare samples for chemical analysis, solid-phase extraction was used to separate PCBs and related compounds from the serum. The samples were then passed through a Florisil column to remove interferences. Each prepared sample was analyzed with a gas chromatograph with electron capture detection with use of two different columns (a DB-5 and a DB-1701). The analytical process was conducted under a rigorous quality assurance program, and data quality objectives were met.

In addition to analyzing the serum samples for PCBs, the CDC laboratory performed a screen for several chlorinated pesticides that are commonly measured at the same time that PCBs are measured.

Results

Blood samples were successfully analyzed for seventeen of the eighteen participants. The blood sample of one participant, the wife of a maintenance shop mechanic, could not be analyzed due to technical difficulties in the laboratory. PCBs were not detectable in the serum of fifteen of the remaining seventeen test subjects (Table 1). Lipid-adjusted results are presented in Appendix 1.

No PCB congeners were detected in the serum of any of the children in this exposure investigation. Trace quantities of several PCB congeners were detected in the serum of two adult males from the maintenance staff. These two persons also had slightly higher levels of several chlorinated pesticides in their serum than did the other fifteen Aniak participants. Very small amounts of two chlorinated pesticides, hexachlorobenzene and p,p'-DDE, were present in the serum of nearly all tested Aniak residents. These were the only two tested chemicals that were

present in the serum of any of the children during this investigation.

Discussion

Serum levels of PCBs were non-detectable in most of the tested Aniak residents. In the two persons with detectable serum PCBs, PCBs levels were low in comparison to national averages. The sensitive test used by the Centers for Disease Control is usually able to detect measurable levels of PCBs in most people from the lower 48. The non-detectable or low PCB levels observed in this investigation indicate that the tested Aniak residents have been exposed to fewer of these contaminants than has the average American. Serum levels of analyzed pesticides in the tested Aniak residents were also consistently lower than median national values. These results likely reflect the relatively pristine nature of the rural Alaskan environment.

None of the Aniak Middle School students or faculty tested had detectable levels of PCBs in their serum. Two members of the maintenance staff had detectable PCBs in their serum, but detected PCB levels were low. Although PCBs have been documented in the soil outside the Aniak Middle School and on some of the school floors, it is apparent that the tested students, faculty and staff were not exposed to the PCBs in any significant amount. This investigation examined students, faculty and staff who were most likely to have been exposed to the highest concentrations of PCBs in the middle school due to their duties or course schedules. Since the tested persons likely represented a "worst case scenario" for PCB exposures at the Aniak Middle School, it is likely that site-related PCB exposures of significance did not occur among other occupants of the building either.

Although low levels of PCBs were detected in the serum of two members of the maintenance staff, it is uncertain whether their PCB exposures were related to the Aniak Middle School site. Serum PCB levels similar to or higher than the detected values are commonly observed in Americans, and can result from the consumption of trace quantities of PCBs from foods. PCBs, as well as the other pesticides analyzed in this investigation, are most commonly found in the fatty tissues of meats and in other foods derived from animal products. These chemicals are very persistent in the body, so they tend to bioaccumulate over time. Levels of PCBs and persistent chlorinated pesticides commonly increase in people as they age, due to a cumulative lifetime exposure of trace levels from the foods they eat. In this exposure investigation, PCBs were only detectable in the serum of the two oldest participants. Levels of several persistent and often food-derived pesticides were also greater in these two persons than in the other Aniak residents tested.

Small quantities of two pesticides, hexachlorobenzene and p,p'-DDE, were detected in the serum of most of the tested Aniak residents. Low levels of these chemicals are found in the tissues of almost all people who are tested. The levels of hexachlorobenzene and p,p'-DDE in the serum of Aniak residents were lower than the levels found in most Americans. Exposure to these pesticides commonly occurs from the consumption of trace quantities of these persistent chemicals from foods of animal origin.

ATSDR Child Health Initiative

ATSDR's Child Health Initiative recognizes that the unique vulnerabilities of children demand

special emphasis in communities faced with contamination of their water, soil, air, or food. Children are at greater risk than adults from certain kinds of exposures to hazardous substances found at waste sites. They are more likely to be exposed because they play outdoors and they often bring food into contaminated areas. They are shorter than adults, which means they breathe dust, soil, and heavy vapors close to the ground. Children are also smaller, resulting in higher doses of chemical exposure per body weight. The developing body systems of children can sustain permanent damage if toxic exposures occur during critical growth stages.

This exposure investigation was conducted to address child health concerns at the Aniak Middle School. PCB contamination was documented in the soil outside the school and on some floor and hallway surfaces within the school. Potential pathways for exposure of children to PCBs included possible inhalation of PCBs on dust particles or incidental ingestion of PCBs from contact with the contaminated surfaces.

No PCB congeners were detected in the serum of any of the children that participated in this exposure investigation. Therefore, the possibility of past exposures of children to significant quantities of PCBs at the site can be ruled out. The possibility of future exposures of children to PCBs at the site has been greatly reduced by recent remedial cleanup actions at the site. A temporary cap has been placed over contaminated soil outside the school, and PCBs have been removed from interior surfaces of the school. The State of Alaska, Department of Environmental Conservation is managing the cleanup activities, which continue at the site.

Conclusions

The test results from this exposure investigation showed that the chemicals tested were not present in amounts that could cause any health effects. Levels of PCBs and analyzed pesticides in the serum of tested Aniak residents were non-detectable or were very low, and were far below the levels associated with any documented toxic effects.

Recommendations

1. Inform and reassure community residents that they have not been exposed to harmful levels of PCBs from the Aniak Middle School site.
2. Clean the environmental contaminants to appropriate levels at the site.

Preparer of Report

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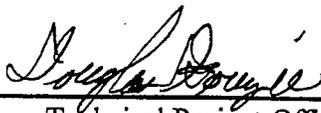
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CERTIFICATION

This Health Consultation for the White Alice Communication Site (a.k.a. Aniak Middle School) Exposure Investigation was prepared by the Alaska Department of Health and Social 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.



Technical Project Officer

Superfund Site Assessment Branch (SSAB)
Division of Health Assessment and Consultation (DHAC)

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this Health Consultation and concurs with its findings.



Richard E. Gillig, M.C.P.
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Table 1: Polychlorinated Biphenyls (PCBs) and chlorinated pesticides in the serum of Aniak residents (all values in ppb, not lipid adjusted)

CHEMICAL	LOD (ppb) ^a	mean (s.d.) samples 1-15	sample 16	sample 17	USA median (ppb) ^e
B-hexachlorocyclohexane	0.23	b	<LOD	<LOD	0.13
dieldrin	0.23	b	<LOD	<LOD	trace
hexachlorobenzene	0.08	0.23 (0.10)	1.41	0.62	1.7
heptachlor epoxide	0.21	b	<LOD	<LOD	1.5
mirex	0.26	b	<LOD	<LOD	n.d.
oxychlorodane	0.20	d	0.34	<LOD	1.4
pp DDE	0.61	1.23 (0.61)	4.02	2.65	12.6
pp DDT	0.66	b	<LOD	<LOD	trace
trans-Nonachlor	0.28	b	0.87	0.39	1.4
PCB-28	0.27	b	<LOD	<LOD	e
PCB-52	0.27	b	<LOD	<LOD	e
PCB-74	0.20	b	<LOD	<LOD	e
PCB-105	0.21	b	<LOD	<LOD	e
PCB-118	0.25	b	0.28	<LOD	e
PCB-138	0.25	b	0.59	0.43	e
PCB-153	0.33	b	0.97	0.76	e
PCB-170	0.22	b	<LOD	<LOD	e
PCB-180	0.23	b	0.29	0.32	e
PCB-194	0.21	b	<LOD	<LOD	e
PCB-203	0.20	b	<LOD	<LOD	e
Sum of detected PCB congeners		b	2.13	1.51	

a: limit of detection (ppb)

b: less than limit of detection in all samples

c: sources: 2, 6-11

d: detected in only one sample (0.63 ppb)

e: medians not available for individual PCB congeners. Median "total PCBs" is approximately 6 ppb

n.d.: not detectable

Appendix 1: Lipid-Adjusted Polychlorinated Biphenyls (PCBs) and chlorinated pesticides in the serum of Aniak residents (all values in ng/g lipid)

CHEMICAL	mean (s.d.) samples 1-15	sample 16	sample 17
B-hexachlorocyclohexane	a	<LOD	<LOD
dieldrin	a	<LOD	<LOD
hexachlorobenzene	38 (13)	167	75
heptachlor epoxide	a	<LOD	<LOD
mirex	a	<LOD	<LOD
oxychlorthane	b	41	<LOD
pp DDE	220 (72)	475	319
pp DDT	a	<LOD	<LOD
trans-Nonachlor	a	103	47
PCB-28	a	<LOD	<LOD
PCB-52	a	<LOD	<LOD
PCB-74	a	<LOD	<LOD
PCB-105	a	<LOD	<LOD
PCB-118	a	33	<LOD
PCB-138	a	70	52
PCB-153	a	115	91
PCB-170	a	<LOD	<LOD
PCB-180	a	35	39
PCB-194	a	<LOD	<LOD
PCB-203	a	<LOD	<LOD
Sum of detected PCB congeners	a	253	182

a: less than limit of detection in all samples

b: detected in only one sample (97 ng/g lipid)