

Letter Health Consultation

Wells Fargo Tower, Review of Indoor Air and Dust Data for Polychlorinated Biphenyls (PCBs) Exposure

Tacoma, Pierce County, Washington

July 2, 2014

Prepared by

**The Washington State Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry**



Foreword

The Washington State Department of Health (DOH) prepared this health consultation under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR is part of the U.S. Department of Health and Human Services. ATSDR is responsible for health issues related to hazardous substances.

The purpose of a health consultation is to assess the health threat posed by hazardous substances in the environment. If needed, a health consultation will also recommend steps or actions to protect public health. Health consultations are initiated in response to health concerns raised by residents or agencies about exposure to hazardous substances.

This health consultation was prepared in accordance with ATSDR methodologies and guidelines. However, the report has not been reviewed and cleared by ATSDR. The findings in this report are relevant to conditions at the site during the time the report was written. It should not be relied upon if site conditions or land use changes in the future.

Use of trade names is for identification only and does not imply endorsement by state or federal health agencies.

For additional information, please contact us at 1-877-485-7316 or visit our web site at www.doh.wa.gov/consults.

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July 2, 2014

John Sherman
Environmental Health Division
Tacoma-Pierce County Health Department
3629 South D Street
Tacoma, Washington 98418

Re: Letter Health Consultation
Review of Indoor Air and Dust Data from Wells Fargo Tower
Tacoma, Pierce County, Washington

Dear Mr. Sherman:

At the request of the Tacoma-Pierce County Health Department (TPCHD), the Washington State Department of Health (DOH) completed this letter health consultation. The evaluation focused on possible human exposure to polychlorinated biphenyls (PCBs) in indoor air and dust at the Wells Fargo Tower (WFT).

In a previous letter health consultation (February 2014), DOH recommended that building management sample indoor air for PCBs to assess exposure to building occupants. The building management followed up with DOH recommendations. Sampling and analysis data of air and dust throughout the building were completed by RGA Environmental, Inc. One limitation identified was that the analytical detection limit for PCBs in air samples was above the health screening value that DOH uses. However, based on the analytical detection limit, cancer risk would be insignificant as PCBs were not detected in any air samples. DOH completed its follow-up review of data from WFT and has found that inhalation of PCBs in indoor air and dust is not expected to harm people's health. DOH recommends that building management continue to implement procedures for cleaning staff that minimize exposure to PCBs that may potentially be present on building surfaces. A summary of the findings is included in this letter.

DOH conducts health consultations under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR).

Background and Statement of Issues

WFT is located in downtown Tacoma at 1201 Pacific Avenue. The tower was built in 1970 and has 24 stories with an additional under-building parking garage. It is a Class A office/retail building with about 308,000 rentable square feet. Tenants include the Wells Fargo Bank, Gordon Thomas Honeywell, Merrill Lunch, Russell Investments, and Propel. The building was last painted approximately 13 years ago. This building was built before PCBs were banned in the United States (U.S.) in 1977, which increases the likelihood that it was constructed using materials containing PCBs.

Sampling and analysis of stormwater sediments in the downtown Tacoma FD3A drainage basin (42 acres) have found consistently elevated levels of PCBs. The City of Tacoma tracked potential sources of contamination and the WFT was one of the buildings identified. The WFT was reported to the Washington State Department of Ecology as a likely source of contamination in stormwater sediments.

The City of Tacoma obtained data from the exterior surfaces of the WFT through the analytical services of the Center for Urban Waters Environmental Services Laboratory. Various exterior samples were collected from the buildings, including paint, caulking, and some soil. These samples were analyzed for PCBs. The TPCHD contacted DOH and requested a letter health consultation that evaluated the data from the exterior samples. That letter health consultation, completed in February 2014, concluded that the exterior data collected by the City of Tacoma were not relevant to evaluating human health risk and potential exposure pathways for building occupants. Recommendations were made in the February 2014 letter health consultation to collect indoor air and/or dust samples for PCBs analysis. Unico Properties LLC followed up with the recommendations and had RGA Environmental, Inc. collect indoor air and dust samples on May 21, 2014.

Industrial hygienists from RGA Environmental, Inc. collected samples at several locations throughout the Wells Fargo Tower in order to determine whether contamination from PCB-containing materials found outside the building was being tracked indoors. Seven air samples and seven dust samples were collected throughout the building. The sampling locations were distributed throughout the building, including primary access points and high-occupancy tenant floors. Air sample locations included the following areas: building entry doors, elevator banks, between the West building entry and escalator on the Court Level, and in elevator lobbies. Dust sample locations included the following areas: walk-off mats at building entries on the Plaza and Court Levels and high traffic areas between elevators and suite entries on tenant-occupied floors throughout the building. Dust (Microvac) samples were collected by square foot areas (1 ft²) and analyzed using National Institute for Occupational Safety and Health (NIOSH) Method 5503. Data were reported in milligrams per cubic meter of air (mg/m³) or micrograms per square foot (µg/ft²). Results were forwarded to DOH on June 11, 2014.

Discussion

PCBs are a mixture of man-made organic chemicals. The manufacture of PCBs stopped in the U.S. in 1977 because of evidence showing that it is a persistent organic pollutant in the environment and harmful to people's health. PCBs can still be found in certain products such as old fluorescent lighting fixtures, electrical devices and appliances containing capacitors, as well as in old building materials. PCBs have entered the environment (soil, water, air) during the manufacture and use of PCBs. There are no known natural sources of PCBs in the environment. Today, PCBs can still enter the environment from illegal or improper dumping, and from various sources still containing PCBs [1].

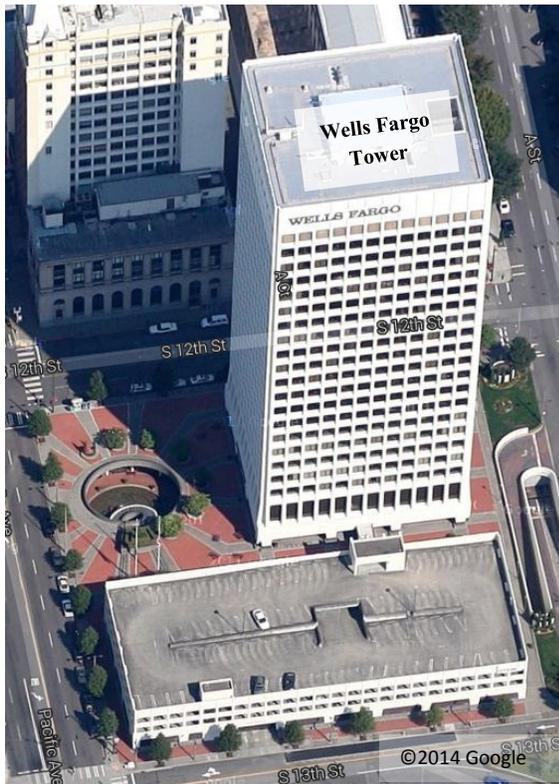


Figure 1: View of the Wells Fargo Tower building in Tacoma, Washington



Figure 2: Vicinity map of site and location in Tacoma, Washington

There are 209 structural variations of PCBs, referred to as congeners, which differ in the number and location of chlorine atoms in the chemical structure. Most PCBs commercially produced in the U.S. were standard mixtures called Aroclors. The conditions for producing each Aroclor favor the synthesis of certain congeners, giving each Aroclor a unique pattern based on its congener composition. No Aroclor contains all 209 congeners.

Once in the environment, PCBs do not breakdown easily and may stay in the soil for months or years. PCBs stick to soil and do not usually move deep into the soil with rainfall. In air, PCBs can be carried long distances. Although levels of PCBs in the environment are decreasing, small amounts of PCBs can be found in almost all outdoor and indoor air, sediments, surface water,

and animals. PCBs build up in the food chain and are stored in the fatty parts of the body. People get most of their exposure to PCBs in the food they eat. The major dietary source of PCBs is fish. PCBs are also found in meats and dairy products [1]. Since the 1980s, levels of PCBs in people have followed a downward trend [2, 3].

Most of what is known about possible human health risks of PCBs comes from animal studies and accidental human exposures to high levels of these chemicals in the workplace [4]. Chronic (long-term) and acute (short-term) exposures to PCBs have been shown to produce a wide array of toxic effects in animals including neurobehavioral, immunological, and developmental deficits in newborns exposed to PCBs through their mothers while in the womb [1]. Health problems seen in humans include skin irritation, vomiting, nausea, diarrhea, abdominal pain, eye irritation, and liver damage.

Exposure Pathways

WFT houses both part-time and full-time office staff. As stated in the February 2014 letter health consultation for this site, the exposure pathway of concern in this building is of an adult inhaling PCBs in indoor air. Particles of contaminated caulking from sidewalks around the buildings can be brought indoors on people's shoes. Cleaning and maintenance staff may have a greater risk of exposure to PCBs in comparison to office workers since PCB-contaminated dust from particles can get dislodged from around windows and other surfaces from cleaning processes.

Indoor Air and Dust Sample Summary

DOH has evaluated the data from RGA Environmental Inc. to determine whether the concentration of PCBs found inside the WFT pose a health concern. In order for any contaminant to be a health concern, the contaminant must be present at a high enough concentration to cause potential harm and there must be a completed route of exposure. Table 1 shows the concentrations PCBs detected.

PCBs were not detected in any indoor air samples. RGA Environmental used NIOSH Method 5503 for sampling and analysis, which is an appropriate method to sample and analyze indoor air samples from this building. It should be noted that NIOSH Method 5503 has an estimated limit of detection of $0.02 \mu\text{g}/\text{m}^3$ at low PCB concentrations and at efficient sampling flow rates (up to 1 L/min for 24 hours). The lower limit of detection for each sample may vary depending on the volume of air sampled, sampling flow rate, the concentration of PCBs in the air, and other environmental conditions. The most protective Agency for Toxic Substances and Disease Registry (ATSDR) screening value for PCBs in indoor air is used to screen air data in DOH health consultations; this value is $0.01 \mu\text{g}/\text{m}^3$, which is slightly below the estimated limit of detection for NIOSH Method 5503. If PCB concentrations were detected above the ATSDR screening level, DOH would consider PCBs a contaminant of concern, and further evaluation of data would be carried out to calculate any potential health risks. Since no contaminants of concern were identified, no further evaluation could be made with the non-detect air data provided.

DOH does not have standards from ATSDR for evaluating data from dust wipe samples or dust samples. However, the Environmental Protection Agency (EPA) has a regulatory clean-up standard for wipes collected from indoor surfaces [1] for PCBs of 10 micrograms per 100 square centimeters ($10\mu\text{g}/100\text{cm}^2$); this standard includes both inhalation and dermal contact. Because dust data from RGA Environmental Inc. was reported in $\mu\text{g}/\text{ft}^2$, DOH calculated that this standard is equivalent to $92.9\mu\text{g}/\text{ft}^2$. EPA estimates that inhalation cancer risk from indoor dust exposure to PCBs at $10\mu\text{g}/100\text{cm}^2$ presents 1 excess cancer case per 1,000,000 exposed (1×10^{-6}). Similarly, EPA estimates that cancer risk from dermal contact with dust containing PCBs at $10\mu\text{g}/100\text{cm}^2$ would be at 1 excess cancer case per 100,000 exposed [5]. Only one of the seven dust samples had a detected level of PCBs. This sample was collected from the North entry walk-off carpet on the Plaza Level. Dust may be tracked indoors from the sidewalk caulk, which could explain why PCBs were only detected here. Sidewalk caulk outside this building may contain high levels of PCBs [6]. This North entry carpet is also the closest carpet to the sidewalk outside [7]. The level of PCBs found in this sample, $1.7\mu\text{g}/\text{ft}^2$, is well below the EPA standard of $92.9\mu\text{g}/\text{ft}^2$ for indoor surfaces.

Table 1. Concentrations of PCBs detected in indoor air and dust from the Wells Fargo Tower, Tacoma, Pierce County, Washington

Sample	Location	Analyte	Concentration	Screening Value	Screening Value Reference	Contaminant of Concern
Air	Plaza Level between W Entry and Elevator Lobby	All Aroclors	ND*	$0.01\mu\text{g}/\text{m}^3$	ATSDR CREG	No
	Plaza Level between N Entry and Elevator Lobby	All Aroclors	ND*			No
	Plaza Level between S Entry and Elevator Lobby	All Aroclors	ND*			No
	Court Level between W Entry and Escalator	All Aroclors	ND*			No
	Floor 5 - NE Corner of Lobby	All Aroclors	ND*			No
	Floor 10 - NW Corner of Lobby	All Aroclors	ND*			No
	Floor 15 - NW Corner of Lobby	All Aroclors	ND*			No
Dust	Plaza Level W Entry at Revolving Door Walk-off Carpet	All Aroclors	ND	$92.9\mu\text{g}/\text{ft}^2$	EPA Spill Clean-up Criteria	No
	Plaza Level N Entry Walk-off Carpet	Aroclor 1260	$1.7\mu\text{g}/\text{ft}^2$			No
	Plaza Level S Entry Walk-off Carpet	All Aroclors	ND			No
	Court Level W Entry Walk-off Mat	All Aroclors	ND			No
	Floor 5 - N Side of Lobby Area Carpet	All Aroclors	ND			No
	Floor 10 - S Side of Lobby Area Carpet	All Aroclors	ND			No
	Floor 15 - Center of Lobby Area Carpet	All Aroclors	ND			No

Sampling and analysis was carried out using National Institute for Occupational Safety and Health (NIOSH) Method 5503, which tested for nine commonly used Aroclor compounds: 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268.

CREG - Cancer Risk Evaluation Guides from Agency for Toxic Substances and Disease Registry (ATSDR)

EPA – Environmental Protection Agency

ND – not detected

* NIOSH Method 5503 Limit of Detection (LOD) is estimated to be $0.02\mu\text{g}/\text{m}^3$, which is above the comparison value. LODs may vary for each sample depending on sampling conditions.

μg - microgram

Conclusions

DOH concludes that inhalation of PCBs in indoor air and dust is not expected to harm people's health in Wells Fargo Tower.

Recommendations

DOH recommends that Unico Properties LLC continue to implement procedures to reduce any potential exposure to PCBs indoors. As stated in the February 2014 letter health consultation for this site, DOH recommends that cleaning staff:

- Clean surfaces frequently to reduce dust and residue inside buildings.
- Use a wet or damp cloth (micro fiber) or mop to clean surfaces.
- Use ventilation and vacuums with high-efficiency particulate air (HEPA) filters.
- Do not sweep with dry brooms; avoid using dusters.
- Wash hands with soap and water after cleaning, and before eating or drinking.

DOH recognizes that Unico Properties LLC is determining options for abatement of PCB-contaminated building materials by working with EPA and other appropriate agencies.

Public Health Action Plan

Actions Planned

1. DOH will provide copies of this letter health consultation to Unico Properties LLC.
2. A copy of this letter health consultation will be placed on the DOH Site Assessments website: <http://www.doh.wa.gov/consults>.
3. If needed, DOH will assist in providing resources and answer health questions that may come up during the abatement of PCB materials.

DOH appreciates the opportunity to assist you with the review of these data. If you have any questions regarding this letter please contact me at 360-236-3357 or by email at Amy.Leang@doh.wa.gov.

Sincerely,

Amy Leang
Health Assessor, Toxicologist
Site Assessments and Toxicology Section

cc: Joanne Snarski, Department of Health
Susan Robicheau, Unico Properties LLC
Scott Brucker, Unico Properties LLC

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