HEALTH CONSULTATION
PUBLIC COMMENT DRAFT

Riverside Agricultural Park Petition: Neighborhood Investigation

RIVERSIDE, CALIFORNIA

Prepared by:
California Department of Public Health

DATE

Prepared under a Cooperative Agreement with the
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
Atlanta, Georgia 30333

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Health Consultation: A Note of Explanation

A Health Consultation is a verbal or written response from ATSDR or ATSDR's Cooperative Agreement Partners 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, the Health Consultation 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.

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

Foreword

The California Department of Public Health (CDPH) prepared this Health Consultation for the Riverside Agricultural Park Petition: Neighborhood Investigation in RIVERSIDE (Riverside County), CALIFORNIA. This publication was made possible by Grant Number 6NU61TS000278-02 under a Cooperative Agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR). CDPH evaluated data of known quality using approved methods, policies, and procedures existing at the date of publication. ATSDR reviewed this document and concurs with its findings based on the information presented by CDPH.

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Abbreviations and Acronyms

ATSDR – Agency for Toxic Substances and Disease Registry
CDPH – California Department of Public Health
CREG – cancer risk evaluation guide
DTSC – (California) Department of Toxic Substances Control
MRL – minimal risk level
PCBs – polychlorinated biphenyls
SAS – Site Assessment Section
USEPA – U.S. Environmental Protection Agency

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Summary

INTRODUCTION

In October 2016, the federal Agency for Toxic Substances and Disease Registry (ATSDR) accepted a petition from the City of Riverside, California, to investigate residents' health concerns regarding potential exposure to contaminants found at Riverside Agricultural Park (Ag Park), specifically polychlorinated biphenyls (PCBs). The Site Assessment Section (SAS) of the California Department of Public Health (CDPH) conducted this investigation under a Cooperative Agreement between ATSDR and CDPH.

The goal of this report is to provide information that you may need to make informed decisions about your health. CDPH worked with the City of Riverside, ATSDR, the U.S. Environmental Protection Agency (USEPA), the California Department of Toxic Substances Control (DTSC), the Riverside Ag Park Off-Site Community Work Group, the Center for Community Action and Environmental Justice (CCAEJ), the Ag Park Family, and individual community members. This Health Consultation (HC) summarizes the public health assessment activities in response to this petition.

CDPH reached two conclusions about the potential health impact of PCBs found in neighborhood surface soil:

CONCLUSION 1

CDPH found no health concerns from exposures to PCBs in surface soil at 24 out of 25 residential parcels, Rutland Park, and the right-of-way west of Ag Park.

BASIS FOR CONCLUSION 1

In Rutland Park and 10 of the residential parcels, PCBs were not detected in surface soils. Thirteen of the residential parcels had PCB concentrations below the ATSDR screening value. On one residential parcel (parcel B), PCBs were found slightly above the screening value in one out of four surface samples; two samples had no detections, and one sample had PCBs below the screening level. CDPH evaluated the health risk for this parcel and concluded that no further investigation is necessary. Therefore, tracking backyard soil indoors is not a concern for these 24 residential parcels. PCBs detected in surface soil on the city-owned right-of-way were about threefold higher than the screening value. CDPH evaluated exposures for recreational use of the right-of-way and found no health concerns.

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NEXT STEPS FOR CONCLUSION 1	CDPH recommends that community members in the Ag Park neighborhood who are concerned about PCBs review the information in the ATSDR fact sheet.
CONCLUSION 2	**CDPH found health concerns related to PCB exposure in surface soil in one residential parcel.**
BASIS FOR CONCLUSION 2	On parcel A, two surface samples exceeded the ATSDR screening value, one sample was below the screening value, and one sample had no PCBs detected. The highest concentration found was about 11-fold higher than the screening value. Based on the highest concentration found and health-protective exposure assumptions, we found that the cancer risk is slightly elevated for children and low for adults.
NEXT STEPS FOR CONCLUSION 2	CDPH recommends that the City of Riverside and DTSC work together to further investigate parcel A, and take measures to reduce exposure to PCBs. Community members in the Ag Park neighborhood who are concerned about PCBs review the information in the ATSDR fact sheet.
LIMITATIONS	We based this investigation on the data we received from DTSC, and information from community groups and individuals. The investigation of the neighborhood was limited to 25 residential parcels next to Ag Park, Rutland Park, and a city-owned right-of-way along the western boundary of Ag Park. These parcels are located in areas where dust from Ag Park would most likely have settled and where the community indicated interest. CDPH evaluated only surface soil samples for this investigation because exposure to deeper soils (2.5 feet depth) is not likely for regular residential or recreational use.
FOR MORE INFORMATION	If you have questions about this Health Consultation, you may contact Dr. Gabriele Windgasse, CDPH, [HYPERLINK "mailto:Gabriele.Windgasse@cdph.ca.gov"] or (510) 620-3610. You can also call ATSDR at 1-800-CDC-INFO and ask for information on the "Riverside Agricultural Park Petition: Neighborhood Investigation."

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The City of Riverside Asks for an Investigation of the Riverside Agricultural Park Neighborhood

On March 25, 2016, the City of Riverside, California, petitioned the federal Agency for Toxic Substances and Disease Registry (ATSDR) on behalf of its concerned residents who live adjacent to Riverside Agricultural Park (Ag Park). The petition requested that ATSDR investigate the residents' health concerns regarding potential exposure to contaminants found at Ag Park, specifically polychlorinated biphenyls (PCBs). On October 10, 2016, ATSDR accepted the petition and asked the Site Assessment Section (SAS) of the California Department of Public Health (CDPH) to conduct the investigation under a Cooperative Agreement between ATSDR and CDPH.

Figure [SEQ Figure * ARABIC] Riverside Agricultural Park, Riverside, CA

CDPH worked with the City of Riverside, ATSDR, the U.S. Environmental Protection Agency (USEPA), the California Department of Toxic Substances Control (DTSC), the Riverside Ag Park Off-Site Community Work Group, the Center for Community Action and Environmental Justice (CCAEJ), the Ag Park Family, and individual community members. This Health Consultation (HC) summarizes the public health assessment activities in response to this petition.

On December 15, 2016, ATSDR received a second petition regarding Ag Park. CCAEJ requested that ATSDR evaluate exposures to chemicals for people who visited the Ag Park site in the past. ATSDR accepted this petition in March 2017, and CDPH is writing a separate HC for this request.

In our investigations, we look at how contamination may affect the health of a community but we cannot predict who will get sick, who will develop cancer, or whether an individual health concern is related to a specific exposure from this site. Our investigations result in recommendations to protect public health, by advising on the ways that communities can reduce exposures to toxic substances. We cannot give medical advice, but we have developed a Patient Information Package for the Ag Park community that hash information for you and your health care provider.

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The History of the Ag Park Site

Ag Park is a 62-acre area bounded by the Santa Ana River to the north and residential housing to the west, south, and east (see Figure 1). From 1942 to 1947, Ag Park was part of Camp Anza, a World War II staging ground for the U.S. Army. From 1942 to 1965, a sewage treatment plant operated at the site, accepting commercial, industrial, and residential sewage. The City of Riverside, which has owned the property since 1962, decommissioned the sewage treatment plant in 1965. Between 1981 and 1986, the city permitted several livestock shows at Ag Park. Each of these shows was a three-day event (Friday through Sunday). Between August 1997 and January 2002, the city permitted the construction and use of a bicycle and motocross track at the park. Several longtime residents indicated that prior to 2003, nearby residents used the park for recreation. Specifically, children played there after school, during the summer, and on weekends, and people walked across the site to get to the Santa Ana River.

In 2003, the city began earthwork and grading activities at Ag Park to prepare it for future residential development. In July 2003, a contractor accidentally ruptured an old sewage tank during earthmoving activities and spilled sewage sludge on the site. The City of Riverside removed approximately 51,000 gallons of sludge from inside the ruptured digester, and 30 cubic yards of sludge-impacted soil (Geomatrix 2006). The city also collected samples of the spilled sludge and sludge-impacted soil and found metals (including lead), solvents, and PCBs.

The discovery of hazardous materials prompted the city to stop development activities, erect additional fencing, and post warning signs along the Ag Park's boundary to restrict public access (August 2003). The broken digester was demolished in July 2004. Since 2004, the California Department of Toxic Substances Control (DTSC) has been the lead agency overseeing multiple investigations and cleanup activities on-site. In 2006, Friends of the Riverside Airport LLC (FRA) purchased the property from the city. This organization is developing the site for residential use.

To investigate if PCB-contaminated dust from Ag Park reached the surrounding neighborhood, DTSC collected soil samples from 25 residential parcels next to Ag Park, Rutland Park, and a city-owned right-of-way (July 2017). In December 2017, DTSC shared the sampling results with the residents and CDPH. This report presents our evaluation of the data and the impact of PCBs on the Ag Park neighborhood.

The Ag Park Neighborhood

The residential neighborhoods within this area lie in three census tracts (410.01, 410.02, and 410.04), with approximately 11,493 persons (U.S. Census Bureau n.d.). The racial and ethnic makeup is roughly 70.1% Hispanic, 19.3% White, 4.8% Asian, 3.6% Black, <1% American Indian and Alaskan Native, <1% Native Hawaiian and Other Pacific Islander, and 1.6% mixed. Among persons five years and older, an estimated 25% do not speak English very well. Of those who do not speak English very well, 88% are primarily Spanish speakers. The remaining 12% are composed of persons who primarily speak Vietnamese, Tagalog, Thai, Mon-Khmer (Cambodian), Chinese, Arabic, or Pacific Island languages.

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Before 1965, based on historical aerial photos, all homes were located at least a quarter mile away from the site. After 1965, homes were built within a quarter mile of the site, including 57 homes along the fence line and 16 across the street from the site.

What Are Polychlorinated Biphenyls (PCBs)?

Polychlorinated biphenyls, or PCBs, are 209 different man-made chemicals. They were used in the past in many applications, including transformers, capacitors, fluorescent lamps, caulking, paints, sealants, and plaster. More than 1 billion pounds of PCBs were sold in the United States before production was stopped in 1979. PCBs do not easily break down in the environment, so they can remain an ongoing concern. PCBs were sold in mixtures ("Aroclors") according to the weight of the chemicals: Aroclor 1016 is the lightest mixture, and Aroclor 1268 is the heaviest mixture. Generally, heavier Aroclors are more toxic, but each of the 209 chemicals has its own toxic effects. Mostly Aroclor 1248 was detected in low concentrations in Ag Park neighborhood soils.

How Do PCBs Get Into Our Bodies?

PCBs can enter our bodies by breathing air or dust contaminated with PCBs (inhalation), touching contaminated soil (skin), and accidentally swallowing soil (ingestion), for example, when children put dirty hands or objects into their mouths. Over time, our bodies store PCBs in the liver, fatty tissue, and breast milk. Therefore, PCB concentrations are typically higher in older persons than in younger ones. We all have PCBs in our body from our diet. Specifically, sport fish, fatty meats, and dairy products can be high in PCBs.

Community Health and Exposure Concerns

Exposure Concerns

The Ag Park community voiced many health and exposure concerns. The primary concern was exposure to windblown dust from Ag Park onto their backyard, home, or vehicles, especially during strong Santa Ana winds. Some residents thought that the contaminated dust could get inside their homes through their windows, HVAC (heating, ventilation, and air-conditioning) system, and from foot traffic in and out of the home. In addition, community members were concerned that windblown dust from the site could contaminate their homegrown vegetables, herbs, and fruit. Additional concerns from the community included plants and trees dying in their yards, potential exposures to workers conducting cleanup at the site, and potential exposures to future residents of homes planned for the site.

Some residents were concerned about having spent time on the site in the past. One community member stated, "My [children] used to play at the site and would come back home full of mud from the site, only to get skin rashes later on."

Evaluation of Exposure Concerns

We evaluated exposures from PCBs in the surface soil from 25 residential parcels that are next to the site, Rutland Park, and a narrow city-owned right-of-way along the western boundary of Ag Park. A second HC will evaluate the potential exposures from on-site uses in the past. We cannot determine potential exposures inside homes because no indoor data are available.

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The most likely exposure to PCBs from vegetables and fruits comes from soil that sticks to the vegetable/fruit surface (root, leaf, or fruit). PCBs are bound to soil and not easily absorbed by the roots. There is very little accumulation of PCBs in tomatoes, citrus, or other fruits (ATSDR n.d.). Since the roots do not take up PCBs, it is unlikely that plants died from PCBs in soil.

Workers conducting cleanup or construction on the Ag Park site have received special training and use personal protective equipment as required. DTSC has tested each of the residential parcels under development on Ag Park to ensure they are safe for residential use. The PCB levels in soil are below the DTSC residential soil-screening level.

Health Concerns

We collected health concerns that community members believe to be related to contamination from Ag Park. We collected these concerns in meetings, phone calls, emails, and comments that concerned community members provided to DTSC. Some residents documented their health issues and concerns on a map of the neighborhood known as the "Measles Map." This map showed the location of recent deaths, diseases, and other health concerns known in the neighborhood. Table 1 lists the concerns collected by CDPH.

Table [SEQ Table * ARABIC]. Community Health Concerns

Community Concerns Related to Cancer	Community Concerns Related to Noncancer Health Effects
Kidney cancer Prostate cancer Breast cancer Cancerous tumors	Skin concerns: nail thinning, persistent dermatitis, skin lesions, skin dryness, rashes, facial swelling, hair loss, hives, cysts, blisters, wounds that won't heal Reproductive/developmental concerns: difficulty conceiving, miscarriages, stillbirth, impaired reproduction, birth defects, developmental delay Neurological concerns: impeded speech, attention deficit disorder, tremors, loss of coordination, migraines, dizziness, headaches, mental disturbance, muscle twitching, brain fog Hormonal concerns: Cushing's syndrome, thyroid disease, swollen lymph glands Immunological concerns: allergies, autoimmune disorders, Hashimoto's disease, Guillain-Barré syndrome Concerns about infections: sore throat, sinusitis, arthritis, leg infection Pulmonary concerns: chronic obstructive pulmonary disease, cough, shortness of breath, asthma

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Community Concerns Related to Cancer	Community Concerns Related to Noncancer Health Effects
	Other concerns: fibromyalgia, bone pain, joint pain, kidney pain, muscle pain, urinary pain, abdominal pain, thoracic pain, chronic fatigue, memory loss, depression, stress, chemical sensitivity, nosebleeds, high blood pressure, high cholesterol, cardiac disease, kidney edema, lumps on body and neck

Some residents also expressed concerns regarding their pets' health, such as tumors, cancers, and Cushing's syndrome.

Discussion of Health Concerns

The self-reported health concerns affect many different organs and cannot easily be explained or analyzed. Diseases or conditions that take a long time to develop (such as cancer) are particularly difficult to explain. Many factors play a role in the development of the diseases and conditions mentioned by the community. These factors include an individual's medical history, genetic makeup, and exposures to chemical, physical, and biological agents throughout life.

Health effects also depend on the toxicity and concentration of the contaminant, the type of exposure (breathing, touching, or swallowing), how often and for how long the person was exposed, and biological factors unique to the exposed person. Another factor to consider is whether the health conditions were present before or after residents moved to the Ag Park neighborhood.

We cannot determine if PCBs caused the specific diseases or conditions reported by the community because many other factors play a role. It is very unlikely that exposure to PCBs would cause all of the reported symptoms and conditions. Any given population will report many of the same symptoms/conditions, including deaths, serious diseases, and developmental and reproductive effects, but more commonly allergies, cough, skin lesions, headaches, fatigue, depression, stress, and other concerns stated by the Ag Park community.

Only a physician can evaluate an individual's specific health concern. Therefore, residents who want to know more about a disease or condition should contact their medical provider.

Outdoor pets (cats and dogs) are exposed to more soil than humans are, but it is difficult to determine their exposure, or what health conditions are connected to PCBs.

Toxic Effects of PCBs

Many toxic effects have been associated with PCBs (ATSDR n.d.). Each of the 209 different chemicals has different effects, and health effects from mixtures such as Aroclors are even more difficult to determine. Most of the studies were done on workers who handled PCBs and were highly exposed, or people highly exposed through their diet.

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The exposures of the Ag Park community to PCBs in backyard soils are much, much lower than the exposures experienced by workers handling PCBs. We are all exposed to low concentrations of PCBs from our diet, especially from fish, fatty meats, and dairy products. Some people may also be exposed to PCBs from old electrical equipment, appliances, and fluorescent lamps. People who live near sites contaminated with PCBs, such as Ag Park, can also be exposed through contact with site soils (breathing, touching, or swallowing). A laboratory test can determine which PCBs are present in a person's blood, fatty tissue, and breast milk.

Cancer

The USEPA has determined that PCBs are probably carcinogenic for humans. The International Agency for Research on Cancer (IARC) has determined that there is sufficient evidence that they cause cancer in humans (ATSDR n.d.). The types of cancer that have been most commonly associated with high exposures to PCBs are cancer of the liver, gallbladder, bile ducts, intestines, and skin (melanoma). The Ag Park community did not report these specific cancers as a concern. High concentrations of PCBs in pregnant women have been associated with elevated risk for testicular cancer in their sons. PCBs have also been associated with a higher risk for non-Hodgkin's lymphoma and prostate cancer. Prostate cancer is a common cancer in U.S. males: about one in nine men will be diagnosed with this disease during their lifetime.

Noncancer

Many noncancer health effects have been associated with PCBs (ATSDR n.d.). At high exposure levels, health effects can include irritation of the lungs and nose, gastrointestinal discomfort, changes in blood and liver, depression, and fatigue. Other effects include changes in the thyroid, skin, and vision; immunological alterations; neurobehavioral changes; and reproductive toxicity. Some studies have shown menstrual disturbances, changes in sperm, and difficulty conceiving children. PCB concentrations in blood have been associated with type 2 diabetes, and neurodegenerative diseases in female workers. PCB exposures have not been associated with Cushing's syndrome, Hashimoto's disease, Guillain-Barré syndrome, or fibromyalgia.

How Can PCBs Affect Children?

Children can be exposed to PCBs in the mother's womb and by drinking breast milk. Exposures to older children are mainly from their diet and environment, such as swallowing contaminated soil or dust (mouthing of hands and dirty objects, eating soil). Children are more vulnerable than adults to the effects of PCBs. Their brain, nervous system, immune system, thyroid, and reproductive organs are still developing. Many studies have looked at the children of mothers exposed to PCBs from work or from their diet. They found that some babies had lower birth weight, motor skill/reflex issues, memory and learning issues, lower IQ, vision problems, and immune system effects. Some of these effects persisted for several years. Some of the mothers were also exposed to other chemicals, in addition to PCBs. High concentrations of PCBs in pregnant women have also been associated with changed hormone levels in newborns, the children's dental development, and impaired sexual maturity. PCBs have not been shown to cause structural birth defects in humans, such as a cleft palate.

If You Are Still Concerned About Your Health

We have a developed a Patient Information Package in English and Spanish for you and your doctor on PCBs and environmental exposures. Please contact us if you would like to receive this packet. If you would like to be tested for PCBs, contact your health care provider. If they cannot

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conduct this test, have them refer you to the University of California (UC) Irvine Center for Occupational and Environmental Health Clinic at (949) 824-8685.

Investigation of Neighborhood Soils

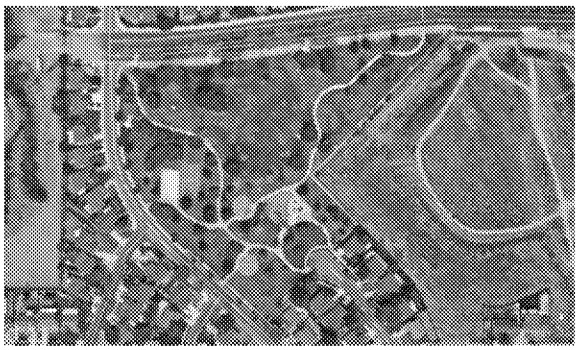

Figure [SEQ Figure * ARABIC]. Sampling locations in Rutland Park

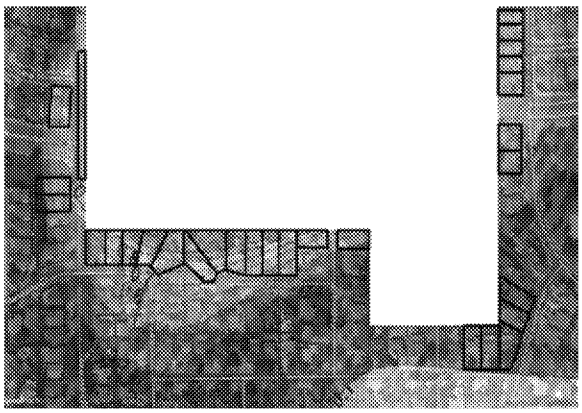

Figure [SEQ Figure * ARABIC] City-owned right-of-way and 28 residential parcels proposed for sampling

Development of the Sampling Plan
We worked with DTSC, the Riverside Ag Park Off-Site Community Work Group, CCAEJ, and individual community members to help develop a sampling plan to evaluate if PCB-contaminated dust from the Ag Park site reached residential backyards bordering the site. DTSC published the proposed sampling plan for public comment in March 2017 and finalized the plan in June 2017 (DTSC June 2017). The plan called for sampling on Rutland Park, located about 100 feet east of Ag Park, 28 residential parcels on three sides of Ag Park (the north side of Ag Park borders the Santa Ana River), and a city-owned right-of-way along the western fence line. Figures 2 and 3 show the proposed sampling locations.

DTSC was not able to investigate three of the 28 residential parcels because the owners were absent or did not give access agreements. With the permission of the owners, samples were collected from 25 residential parcels and two public areas. DTSC collected surface soil at four locations on each parcel (at a depth of 0–6 inches), and collected soil at a depth of 2.5 feet on 11 residential parcels. DTSC analyzed all the samples for PCBs at its laboratory. To help confirm the validity of the results, the USEPA laboratory analyzed 13 of these samples (split samples) for PCBs.

How Much PCBs Were Found in the Neighborhood Surface Soils?

1. No PCBs were found in surface soil at 10 residential parcels and Rutland Park.
2. PCBs were detected at concentrations lower than the screening value (see below) in surface soil at 13 residential parcels.
3. PCBs were detected above the screening value at two residential parcels and at the right-of-way. We evaluated these three parcels further.

In December 2017, DTSC notified each of the owners/residents about the soil sampling results, and shared the results with CDPH. Appendix A shows all sampling results ordered by parcel and

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PCB concentrations (Aroclor 1248). To assure privacy, we do not identify the location of individual samples or parcels.

What Soil Screening Value Did CDPH Use?

To identify which parcel would need further evaluation, we used a screening value of 0.19 mg/kg (milligram of PCB per kilogram of soil). If more than one Aroclor was detected in one sample analysis, we summed the Aroclors and compared the sum to the screening value. This screening value is called the cancer risk evaluation guide (CREG) and is published by ATSDR. It is based on the potential cancer-causing actions of PCBs. This concentration of PCBs in soil is likely to cause one additional cancer case in 1 million people similarly exposed. This commonly accepted threshold is also called the "point of departure" risk of one case in 1 million. DTSC used a screening value of 0.22 mg/kg, which is similar to the USEPA regional screening level (RSL) for Aroclor 1248 of 0.23 mg/kg (USEPA n.d.).

Evaluation of Public Health Concerns From Neighborhood Soils

How Can People Be Exposed to Backyard Soil?
We looked at how people could be exposed to PCBs in surface soil from activities in their front or backyard, such as sitting outside, playing, or gardening. The most common pathways for soil exposures are:

- Accidentally swallowing soil, for example, when small children put dirty hands or objects in their mouth, or drinking/eating/smoking with dirty hands.
- Touching soil with hands or bare feet, arms, or legs.
- Inhaling backyard soil dust. The dust in the air is a mixture of surface soil from the backyard and windblown dust. The dust concentration also depends on the type of backyard surface/landscaping (bare soil or grass), the activity (sitting quietly, playing ball, or gardening), and the weather conditions (wet, dry, windy).
- Eating fruits or vegetables with contaminated soil attached to the surface.

We evaluated exposures from accidentally swallowing and/or touching surface soil contaminated with PCBs. We did not evaluate exposure to subsurface soil because contact with soil 2.5 feet and deeper is not likely. We also did not evaluate the inhalation of backyard soil dust because of the lack of data on backyard conditions, individual activities, and dust samples. We assume that only very small amounts of PCBs will enter the body this way. We did not evaluate exposure to PCBs from soil attached to homegrown vegetables or fruits because most residents eat few homegrown fruits and vegetables, and we assume that only very small amounts of PCBs will enter the body this way.

Evaluation of Three Parcels With the Highest PCB Concentrations
Residential parcel A, residential parcel B, and the right-of-way had PCB concentrations of Aroclor 1248 in surface soil that exceeded the screening value of 0.19 mg/kg (see Table 2).

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Table [SEQ Table * ARABIC]. PCB Concentrations at Three Neighborhood Parcels

Parcel	Concentration of Aroclor 1248 in Surface Soil Samples (mg/kg)
Parcel A	**2.14** **1.29** 0.091 ND (<0.051)
Parcel B	**0.275** 0.062 ND (<0.050) ND (<0.052)
Right-of-way	**0.529** ND (<0.051) ND (<0.101) ND (<0.101)

ND = not detected.
Bold values are detections that exceeded the ATSDR screening value of 0.19 mg/kg.

Residential parcel A had two surface samples that exceeded the screening value. The highest concentration exceeded the screening value by about 11-fold. USEPA analyzed soil from the sample with the second-highest PCB concentration (also known as a split sample) and detected low concentrations of Aroclor 1260 (0.18 mg/kg), but not Aroclor 1248. DTSC and the City of Riverside are working with the residents at parcel A to conduct further investigations and cleanup. CDPH provided an individual evaluation to the residents.

Residential parcel B had one surface sample that slightly exceeded the screening level.

The city-owned right-of-way had one surface sample that exceeded the screening value by about three-fold.

Estimation of Health Risks From PCB Concentrations in Surface Soil

We evaluated how much exposure to PCBs people could have during normal activities, such as spending time in their backyard, playing, and gardening. We paid special attention to children's exposures because they spend more time outdoors, are more likely to touch soil with their bare feet and hands, and may put hands or dirty objects into their mouth.

Potential Cancer Risks
For parcels where PCBs were not found or were found below the screening value, the potential cancer risk is below the point-of-departure risk of one case in 1 million people similarly exposed.

For parcels A and B, we calculated the potential cancer risks based on the highest and lowest PCB concentrations found in surface soil, as it is very unlikely that one person will spend their entire time outdoors at the one location where the highest PCB concentration was found. This "risk range" provides a better estimate of the exposure residents may experience.

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We used standard health-protective assumptions to describe residential exposures for swallowing soil and contact with skin: We included all age groups (6 weeks to 80 years); we assumed exposures for 365 days/year, for 12 or 33 years of residence; we assumed that children swallow 200 mg of soil per day and adults swallow 100 mg of soil per day. For contact with skin, we assumed children are barefoot all the time, and that children and adults wore shorts and T-shirts year-round. Appendix B lists the parameters and equations used.

These assumptions likely overestimate the exposures to PCBs. For instance, most children and adults will swallow less soil per day than the amounts we assumed. Likewise, there may be days when they did not enter the backyard, and children may wear shoes and long pants for part of the year. Given the use of health-protective assumptions in this HC, the actual cancer risks from touching and swallowing soil are likely to be lower than our estimates (see Table 3).

Table [SEQ Table * ARABIC]. Estimates of Health Risks: Range of Cancer Risk

	Cancer Risk: Children	Cancer Risk: Adults
Parcel A	<1 in 1 million to 11 in 1 million	<1 in 1 million to 3.6 in 1 million
Parcel B	<1 in 1 million to 1.5 in 1 million	<1 in 1 million
Right-of-way	<1 in 1 million	<1 in 1 million

Parcel A
For children, the potential cancer risk ranges from less than 1 in 1 million to 11 in 1 million. For adults, the potential cancer risk ranges from less than 1 in 1 million to 3.6 in 1 million. Based on the maximum concentration found in surface soil and health-protective assumptions, the cancer risks are slightly elevated for children, and low for adults. We agree with DTSC's decision to investigate this parcel further.

Parcel B
Based on the maximum concentration found in surface soil and health-protective assumptions, the cancer risk is low for children, and less than 1 in 1 million for adults. The cancer risk associated with regular use of this residence is near the point-of-departure risk of 1 in 1 million. Therefore, we do not recommend further investigation of this parcel.

Right-of-Way
Exposures to soil from this area are much less than for a residential setting. Activities most likely associated with exposures to soil in this area include walking, biking, or similar activities that involve minimal exposures to soil. We used recreational exposure assumptions to calculate potential cancer risks. For both children and adults, cancer risks were below 1 in 1 million.

Potential Noncancer Health Risks
The noncancer health effects are difficult to evaluate since the type of PCB found (primarily Aroclor 1248) is not the same as the PCB used to calculate the screening level for noncancer effects (Aroclor 1254). ATSDR bases the noncancer screening level on the amount or dose of PCBs that is safe for children and adults to swallow every day without developing health effects. This is called the minimal risk level (MRL). The MRL for Aroclor 1254 is 0.02 µg/kg/day

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(micrograms of PCB swallowed per kilogram of body weight per day) (ATSDR n.d.). We calculated the doses from swallowing soil and compared them to the MRL (see Table 4).

Table [SEQ Table * ARABIC]. Estimates of Health Risks: Range of Noncancer Hazard

	Noncancer Hazard: Children	Noncancer Hazard: Adults
Parcel A	<MRL to 0.038 µg/kg/day	<MRL
Parcel B	<MRL	<MRL
Right-of-way	<MRL	<MRL

Parcel A
Using the maximum concentration of PCBs found, children under 6 years old would have swallowed slightly more than the MRL. The estimated daily doses for both children aged seven to less than 21 and adults were less than the MRL. Using the minimum concentration of PCBs found, all children's and adults' estimated exposure doses were less than the MRL. Again, we based these calculations on health-protective assumptions. We do not expect noncancer health effects from this exposure.

Parcel B and the Right-of-Way
Children and adults would have swallowed less than the MRL. We do not expect noncancer health effects from this exposure.

CDPH's Community Outreach and Education Activities

Listening to the Ag Park Community and Providing Resources
An important part of our public health assessment activities is the collection, documentation, and response to community health and exposure concerns. We visited the site and the neighborhood on several occasions, including meetings with the Riverside Ag Park Off-Site Community Work Group, CCAEJ, DTSC, and individual community members. We also responded to many phone calls and emails from community members with questions regarding health and exposure concerns related to the site.

Community Meeting
On May 9, 2017, CDPH held a community meeting at the Terrace Elementary School. About 37 community members attended. At this meeting, we explained our role at Ag Park. This included an overview of the two investigations we are conducting, the limitations of our work, what PCBs are and how they can enter the body, the health effects of PCBs, the difficulty of linking exposures to specific health effects, potential PCB exposures at Ag Park, how to reduce overall exposures to PCBs, and the next steps in the process of the HCs. Community members were able to ask questions and share their health and exposure concerns. We also provided PCB fact sheets

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in English and Spanish, along with a Patient Information Package, and asked for feedback on outreach and education strategies for the community.

Patient Information Package

In response to requests from the community to have information available when they visit their health care provider, we developed a Patient Information Package that includes a letter to the health care provider, an exposure history form, and a fact sheet on PCBs from ATSDR (in English and Spanish). We distributed 90 copies at the community meeting. After the meeting, we mailed out an informational letter to the community (3,000 recipients) informing them of the availability of the Patient Information Package. To date we have distributed about 200 Patient Information Packages to the community. This information is also available on our website: **[HYPERLINK "http://cdph.news/SAS"].**

Outreach to Health Care Providers

Many physicians are not familiar with PCBs and their health effects. Therefore, we reached out to the health care providers near Ag Park. On April 20, 2017, we emailed a letter to 15 clinics and hospitals that was distributed to more than 1,500 physicians. In the letter, we explained the ongoing investigation of PCB exposures at Ag Park and the community concerns associated with the site. The letter also provided educational resources developed by the CDC on the toxicity of PCBs, on taking an environmental exposure history, and on children's environmental health, as well as contact information for the Occupational and Environmental Health Clinic at UC Irvine.

Community Education Workshops

Based on requests received from the community, we offered two community education workshops on how to reduce exposures to toxic substances. On October 4, 2017, we held two workshops (in English and Spanish) at the Terrace Elementary School, with 13 participants. These workshops did not target exposures to PCBs from Ag Park, but focused on practical ways for families to reduce exposures to harmful chemicals at home, at work, and while pursuing hobbies.

Conclusions

CDPH reached the following two conclusions:

1. **CDPH found no health concerns from exposures to PCBs in surface soil at 24 out of 25 residential parcels, Rutland Park, and the right-of-way west of Ag Park.**

   In Rutland Park and 10 of the residential parcels, PCBs were not detected in surface soils. Thirteen of the residential parcels had PCB concentrations below the ATSDR screening value. On one residential parcel (parcel B), PCBs were found slightly above the screening value in one out of four surface samples; two samples had no detections, and one sample had PCBs below the screening level. CDPH evaluated the health risk for this parcel and concluded that no further investigation is necessary. Therefore, tracking backyard soil indoors is not a concern for these 24 residential parcels. PCBs detected in surface soil on the city-owned right-of-way were about threefold higher than the screening value. CDPH evaluated exposures for recreational use of the right-of-way and found no health concerns

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2. **CDPH found health concerns related to PCB exposure in surface soil in one residential parcel.**

   On parcel A, two surface samples exceeded the ATSDR screening value, one sample was below the screening value, and one sample had no PCB detections. The highest concentration found was about 11-fold higher than the screening value. Based on the highest concentration found and health-protective exposure assumptions, we found that the cancer risk is slightly elevated for children and low for adults.

Recommendations

CDPH recommends that:

1. The City of Riverside and DTSC work together to further investigate parcel A, and take measures to reduce exposure to PCBs.

2. Community members in the Ag Park neighborhood who are concerned about PCBs review the information in the ATSDR fact sheet.

Public Health Action Plan

Completed activities:
Since CDPH became engaged at Riverside Ag Park in December 2016, we have worked with the City of Riverside, DTSC, USEPA, local community groups, and individual community members. We provided information and resources to the community, such as information on PCBs and the Patient Information Package. Based on community interest, we held a community meeting and two community workshops.

Ongoing activities:
In a second HC, we will evaluate the potential health risks from on-site exposures in the past.

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Report Preparation

The California Department of Public Health (CDPH) prepared this Health Consultation for the Riverside Agricultural Park Petition: Neighborhood Investigation in RIVERSIDE (Riverside County), CALIFORNIA. This publication was made possible by Grant Number 6NU61TS000278-02 under a Cooperative Agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR). CDPH evaluated data of known quality using approved methods, policies, and procedures existing at the date of publication. ATSDR reviewed this document and concurs with its findings based on the information presented by CDPH.

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Appendix A: Neighborhood Sampling Results

Twenty-five residential parcels, the right-of-way, and Rutland Park were sampled July 5–29, 2017.
Data sorted according to the highest Aroclor 1248 concentration in surface soil in each parcel.

Parcel and Sample ID	Sample Depth	Aroclor 1016 (mg/kg)	Aroclor 1221 (mg/kg)	Aroclor 1232 (mg/kg)	Aroclor 1242 (mg/kg)	Aroclor 1248 (mg/kg)	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)	Aroclor 1262 (mg/kg)	Aroclor 1268 (mg/kg)	Total PCBs (mg/kg)
A-1-SS	Surface	ND<0.102	ND<0.102	ND<0.102	ND<0.102	**1.29**	ND<0.102	ND<0.102	ND<0.102	ND<0.102	**1.29**
A-2-SS	Surface	ND<0.207	ND<0.207	ND<0.207	ND<0.207	**2.14**	ND<0.207	ND<0.207	ND<0.207	ND<0.207	**2.14**
A-3-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	0.091	ND<0.051	ND<0.051	ND<0.051	ND<0.051	0.091
A-4-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
A-5-SS EPA (Split of A-1-SS)	Surface	ND<0.013	ND<0.028	ND<0.013	ND<0.013	ND<0.013	ND<0.013	0.18	ND<0.013	ND<0.013	0.18
Right-of-Way-1-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
Right-of-Way-2-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	**0.529**	ND<0.051	ND<0.051	ND<0.051	ND<0.051	**0.529**
Right-of-Way-3-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.101	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
Right-of-Way-4-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.101	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
B-1-SS	Surface	ND<0.101	ND<0.101	ND<0.101	ND<0.101	**0.275**	ND<0.101	ND<0.101	ND<0.101	ND<0.101	**0.275**
B-2-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	0.062	ND<0.051	ND<0.051	ND<0.051	ND<0.051	0.062
B-3-SS	Surface	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND
B-4-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND
C-1-SS	Surface	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND
C-2-SS	Surface	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND
C-3-SS	Surface	ND<0.055	ND<0.055	ND<0.055	ND<0.055	0.172	ND<0.055	ND<0.055	ND<0.055	ND<0.055	0.172
C-4-SS	Surface	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND
C-5-SS (Duplicate of C-1-SS)	Surface	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND

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C-2-2.5	2.5 feet	ND<0.055	ND<0.055	ND<0.055	ND<0.055	ND<0.109	ND<0.055	ND<0.055	ND<0.055	ND<0.055	ND
C-5-SS EPA (Split of C-1-SS)	Surface	ND<0.14	ND<0.29	ND<0.14	ND<0.14	ND<0.14	ND<0.14	0.0082 C1, J	ND<0.14	ND<0.14	0.008
D-1-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	0.059	ND<0.052	ND<0.052	ND<0.052	ND<0.052	0.059
D-2-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND
D-3-SS	Surface	ND<0.060	ND<0.060	ND<0.060	ND<0.060	0.091	ND<0.060	ND<0.060	ND<0.060	ND<0.060	0.091
D-4-SS	Surface	ND<0.060	ND<0.060	ND<0.060	ND<0.060	0.082	ND<0.060	ND<0.060	ND<0.060	ND<0.060	0.082
D-5-SS (Duplicate of D-1-SS)	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	0.154	ND<0.052	ND<0.052	ND<0.052	ND<0.052	0.154
E-1-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	0.069	ND<0.051	ND<0.051	ND<0.051	ND<0.051	0.069
E-2-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
E-3-SS	Surface	ND<0.057	ND<0.057	ND<0.057	ND<0.057	0.145	ND<0.057	ND<0.057	ND<0.057	ND<0.057	0.145
E-4-SS	Surface	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND
E-1-2.5	2.5 feet	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND
E-5-SS (Duplicate of E-1-SS)	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	0.069	ND<0.051	ND<0.051	ND<0.051	ND<0.051	0.069
E-6-2.5 (Duplicate of E-1-2.5)	2.5 feet	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND
E-1-SS EPA (Split of E-1-SS)	Surface	ND<0.013	ND<0.028	ND<0.013	ND<0.013	ND<0.013	ND<0.013	0.041 G1, J	ND<0.013	ND<0.013	0.041
E-1-2.5 EPA (Split of E-1-2.5)	2.5 feet	ND<0.015	ND<0.030	ND<0.015	ND<0.015	ND<0.015	ND<0.015	ND<0.015	ND<0.015	ND<0.015	ND
F-1-SS	Surface	ND<0.053	ND<0.053	ND<0.053	ND<0.053	0.121	ND<0.053	ND<0.053	ND<0.053	ND<0.053	0.121
F-2-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.104	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND
F-3-SS	Surface	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND
F-4-SS	Surface	ND<0.066	ND<0.066	ND<0.066	ND<0.066	ND<0.066	ND<0.066	ND<0.066	ND<0.066	ND<0.066	ND
F-5-SS (Duplicate of F-1-SS)	Surface	ND<0.053	ND<0.053	ND<0.053	ND<0.053	0.14	ND<0.053	ND<0.053	ND<0.053	ND<0.053	0.14
G-1-SS	Surface	ND<0.101	ND<0.101	ND<0.101	ND<0.101	ND<0.101	ND<0.101	ND<0.101	ND<0.101	ND<0.101	ND
G-2-SS	Surface	ND<0.061	ND<0.061	ND<0.061	ND<0.061	0.065	ND<0.061	ND<0.061	ND<0.061	ND<0.061	0.065

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G-3-SS	Surface	ND<0.057	ND<0.057	ND<0.057	ND<0.057	0.138	ND<0.057	ND<0.057	ND<0.057	ND<0.057	0.138
G-4-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND
H-1-SS	Surface	ND<0.054	ND<0.054	ND<0.054	ND<0.054	0.102	ND<0.054	ND<0.054	ND<0.054	ND<0.054	0.102
H-2-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	0.129	ND<0.052	ND<0.052	ND<0.052	ND<0.052	0.129
H-3-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND
H-4-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND
H-5-SS (Duplicate of H-1-SS)	Surface	ND<0.054	ND<0.054	ND<0.054	ND<0.054	0.083	ND<0.054	ND<0.054	ND<0.054	ND<0.054	0.083
I-1-SS	Surface	ND<0.156	ND<0.156	ND<0.156	ND<0.156	ND<0.156	ND<0.156	ND<0.156	ND<0.156	ND<0.156	ND
I-2-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	0.125	ND<0.052	ND<0.052	ND<0.052	ND<0.052	0.125
I-3-SS	Surface	ND<0.172	ND<0.172	ND<0.172	ND<0.172	ND<0.172	ND<0.172	ND<0.172	ND<0.172	ND<0.172	ND
I-4-SS	Surface	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND
I-2-2.5	2.5 feet	ND<0.055	ND<0.055	ND<0.055	ND<0.055	0.171	ND<0.055	ND<0.055	ND<0.055	ND<0.055	0.171
J-1-SS	Surface	ND<0.054	ND<0.054	ND<0.054	ND<0.054	0.110	ND<0.054	ND<0.054	ND<0.054	ND<0.054	0.110
J-2-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
J-3-SS	Surface	ND<0.176	ND<0.176	ND<0.176	ND<0.176	ND<0.176	ND<0.176	ND<0.176	ND<0.176	ND<0.176	ND
J-4-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
J-1-2.5	2.5 feet	ND<0.054	ND<0.054	ND<0.054	ND<0.054	0.084	ND<0.054	ND<0.054	ND<0.054	ND<0.054	0.084
K-1-SS	Surface	ND<0.105	ND<0.105	ND<0.105	ND<0.105	ND<0.105	ND<0.105	ND<0.105	ND<0.105	ND<0.105	ND
K-2-SS	Surface	ND<0.053	ND<0.053	ND<0.053	ND<0.053	0.101	ND<0.053	ND<0.053	ND<0.053	ND<0.053	0.101
K-3-SS	Surface	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND
K-4-SS	Surface	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND
K-5-SS (Duplicate of K-1-SS)	Surface	ND<0.053	ND<0.053	ND<0.053	ND<0.053	0.066	ND<0.053	ND<0.053	ND<0.053	ND<0.053	0.066
K-5-SS EPA (Split of K-1-SS)	Surface	ND<0.014	ND<0.028	ND<0.014	ND<0.014	ND<0.014	ND<0.014	0.010 C1,J	ND<0.014	ND<0.014	0.010
L-1-SS	Surface	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND
L-2-SS	Surface	ND<0.060	ND<0.060	ND<0.060	ND<0.060	0.1	ND<0.060	ND<0.060	ND<0.060	ND<0.060	0.1
L-3-SS	Surface	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND
L-4-SS	Surface	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND

M-1-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
M-2-SS	Surface	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND
M-3-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	0.065	ND<0.051	ND<0.051	ND<0.051	ND<0.051	0.065
M-4-SS	Surface	ND<0.060	ND<0.060	ND<0.060	ND<0.060	ND<0.060	ND<0.060	ND<0.060	ND<0.060	ND<0.060	ND
N-1-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
N-2-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
N-3-SS	Surface	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND<0.122	ND<0.061	ND<0.061	ND<0.061	ND<0.061	ND
N-4-SS	Surface	ND<0.060	ND<0.060	ND<0.060	ND<0.060	ND<0.119	ND<0.060	ND<0.060	ND<0.060	ND<0.060	ND
N-5-2.5	2.5 feet	ND<0.161	ND<0.161	ND<0.161	ND<0.161	**0.246**	ND<0.161	ND<0.161	ND<0.161	ND<0.161	**0.246**
N-5-SS EPA (Split of N-4-SS)	Surface	ND<0.015	ND<0.032	ND<0.015	ND<0.015	ND<0.015	ND<0.015	0.0095 C1, J	ND<0.015	ND<0.015	0.0095
O-1-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.102	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
O-2-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.103	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
O-3-SS	Surface	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND<0.107	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND
O-4-SS	Surface	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.105	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND
O-2-2.5	2.5 feet	ND<0.057	ND<0.057	ND<0.057	ND<0.057	**0.210**	ND<0.057	ND<0.057	ND<0.057	ND<0.057	**0.210**
P-1-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.102	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
P-2-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.102	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
P-3-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.104	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND
P-4-SS	Surface	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.106	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND
P-2-2.5	2.5 feet	ND<0.056	ND<0.056	ND<0.056	ND<0.056	0.136	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND
Q-1-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
Q-2-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
Q-3-SS	Surface	ND<0.102	ND<0.102	ND<0.102	ND<0.102	ND<0.102	ND<0.102	ND<0.102	ND<0.102	ND<0.102	ND
Q-4-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND
Q-5-SS (Duplicate of Q-1-SS)	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
Q-5-SS EPA (Split of Q-1-SS)	Surface	ND<0.013	ND<0.028	ND<0.013	ND<0.013	ND<0.013	ND<0.013	ND<0.013	ND<0.013	ND<0.013	ND
Q-1-2.5	2.5 feet	ND<0.056	ND<0.056	ND<0.056	ND<0.056	0.114	ND<0.056	ND<0.056	ND<0.056	ND<0.056	0.114

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Q-6-2.5 (Duplicate of Q-1-2.5)	2.5 feet	ND<0.056	ND<0.056	ND<0.056	ND<0.056	0.113	ND<0.056	ND<0.056	ND<0.056	ND<0.056	0.113
Q-6-2.5 EPA (Split of Q-1-2.5)	2.5 feet	ND<0.014	ND<0.030	ND<0.014	ND<0.014	ND<0.014	ND<0.014	0.014 C1, J	ND<0.014	ND<0.014	0.014
R-1-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
R-1-2.5	2.5 feet	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND
R-2-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.103	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
R-3-SS	Surface	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND
R-4-SS	Surface	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND
S-1-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.104	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND
S-2-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.103	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
S-3-SS	Surface	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.118	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND
S-4-SS	Surface	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND<0.124	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND
S-5-SS (Duplicate of S-1-SS)	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.104	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND
S-5-SS EPA (Split of S-1-SS)	Surface	ND<0.013	ND<0.028	ND<0.013	ND<0.013	ND<0.013	ND<0.013	ND<0.013	ND<0.013	ND<0.013	ND
T-1-SS	Surface	ND<0.067	ND<0.067	ND<0.067	ND<0.067	ND<0.133	ND<0.067	ND<0.067	ND<0.067	ND<0.067	ND
T-2-SS	Surface	ND<0.065	ND<0.065	ND<0.065	ND<0.065	ND<0.130	ND<0.065	ND<0.065	ND<0.065	ND<0.065	ND
T-3-SS	Surface	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND<0.123	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND
T-4-SS	Surface	ND<0.058	ND<0.058	ND<0.058	ND<0.058	ND<0.116	ND<0.058	ND<0.058	ND<0.058	ND<0.058	ND
T-5-SS (Duplicate of T-1-SS)	Surface	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND<0.135	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND
T-5-SS EPA (Split of T-1-SS)	Surface	ND<0.017	ND<0.035	ND<0.017	ND<0.017	ND<0.017	ND<0.017	ND<0.017	ND<0.017	ND<0.017	ND
U-1-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND
U-2-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND
U-3-SS	Surface	ND<0.055	ND<0.055	ND<0.055	ND<0.055	ND<0.110	ND<0.055	ND<0.055	ND<0.055	ND<0.055	ND
U-4-SS	Surface	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.117	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND
V-1-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND

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V-2-SS	Surface	ND<0.155	ND<0.155	ND<0.155	ND<0.155	ND<0.155	ND<0.155	ND<0.155	ND<0.155	ND<0.155	ND
V-3-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
V-4-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
V-1-2.5	2.5 feet	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND
W-1-SS	Surface	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND<0.052	ND
W-2-SS	Surface	ND<0.055	ND<0.055	ND<0.055	ND<0.055	ND<0.055	ND<0.055	ND<0.055	ND<0.055	ND<0.055	ND
W-3-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
W-4-SS	Surface	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND<0.056	ND
X-1-SS	Surface	ND<0.058	ND<0.058	ND<0.058	ND<0.058	ND<0.116	ND<0.058	ND<0.058	ND<0.058	ND<0.058	ND
X-2-SS	Surface	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND<0.123	ND<0.062	ND<0.062	ND<0.062	ND<0.062	ND
X-3-SS	Surface	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.119	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND
X-4-SS	Surface	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND<0.118	ND<0.059	ND<0.059	ND<0.059	ND<0.059	ND
X-5-SS (Duplicate of X-1-SS)	Surface	ND<0.058	ND<0.058	ND<0.058	ND<0.058	ND<0.117	ND<0.058	ND<0.058	ND<0.058	ND<0.058	ND
X-5-SS EPA (Split of X-1-SS)	Surface	ND<0.015	ND<0.031	ND<0.015	ND<0.015	ND<0.015	ND<0.015	0.012 C1, J	ND<0.015	ND<0.015	0.012
Y-1-SS	Surface	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND<0.057	ND
Y-2-SS	Surface	ND<0.077	ND<0.077	ND<0.077	ND<0.077	ND<0.077	ND<0.077	ND<0.077	ND<0.077	ND<0.077	ND
Y-3-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
Y-4-SS	Surface	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND<0.051	ND
Y-5-SS EPA (Split of Y-4-SS)"	Surface	ND<0.013	ND<0.027	ND<0.013	ND<0.013	ND<0.013	ND<0.013	0.0069 C1, J	ND<0.013	ND<0.013	0.0069
Y-1-2.5	2.5 feet	ND<0.163	ND<0.163	ND<0.163	ND<0.163	ND<0.057	ND<0.163	ND<0.057	ND<0.163	ND<0.163	ND
Rutland Park-1-SS	Surface	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND
Rutland Park-2-SS	Surface	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND<0.053	ND
Rutland Park-3-SS	Surface	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND<0.068	ND
Rutland Park-4-SS	Surface	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND<0.054	ND
Rutland Park-5-SS EPA (Split of	Surface	ND<0.017	ND<0.035	ND<0.017	ND<0.017	ND<0.017	ND<0.017	ND<0.017	ND<0.017	ND<0.017	ND

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Rutland Park-1-SS)											

C1 The reported concentration for this analyte is below the quantitation limit.

J The reported result for this analyte should be considered an estimated value.

Bold values are detections over screening value of 0.18 mg/kg.

Grey highlight indicates a subsurface sample collected at 2.5 feet depth.

Yellow highlight indicates samples that were used for further evaluation.

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Appendix B: Exposure Parameters and Risk Calculations

CDPH used ATSDR's Public Health Assessment Site Tool (PHAST) to calculate the potential cancer risks from ingestion and dermal contact.

Parcel A and B: Residential Exposure

Contaminant Information for Parcel A

Contaminant Name	Entered Concentration	Type	Converted Concentration	Dermal Absorption Fraction	GI Absorption Factor (dermal)	Bioavailability Factor
POLYCHLORINATED BIPHENYLS	2.14	Maximum	2.14 mg/kg	0.14	1	1

Contaminant Information for Parcel B

Contaminant Name	Entered Concentration	Type	Converted Concentration	Dermal Absorption Fraction	GI Absorption Factor (dermal)	Bioavailability Factor
POLYCHLORINATED BIPHENYLS	0.275	Maximum	0.275 mg/kg	0.14	1	1

§ Cancer risk (CR) is derived for both CTE (Central Tendency Exposure, 12 years) and RME (Reasonable Maximum Exposure, 33 years) residential occupancy periods. For children, CRs are derived for a combined child receptor: CTE (12 years) and RME (21 years) at a given residence. For the CTE child CR, the combined child is the sum of the cancer risks for each age group for the first 12 years of exposure only. The RME CR for the combined child is derived by summing all the cancer risks for each age group from birth to < 21 years. The adult CR assumes living at the residence for 12 (CTE) or 33 (RME) years.
NC: noncancer.

Exposure for 7 days/week, 52.14 weeks per year.

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Exposure Parameters for residential exposures on Parcel A and B

Soil Ingestion Exposure Dose Equation D = (C * IR * EF * CF) / BW D = Exposure Dose (mg/kg-day), C = Contaminant Concentration (mg/kg), IR = Intake Rate (mg/day), EF = Exposure Factor (unitless), CF = Conversion Factor (10-6 kg/mg), BW = Body Weight (kg)								
Soil Dermal Absorbed Dose Equation DAD = (C * EF * CF * AF * ABSd * SA) / BW * ABSGI DAD = Dermal Absorbed Dose (mg/kg-day), C = Contaminant Concentration (mg/kg), EF = Exposure Factor (unitless), CF = Conversion Factor (10^{-6} kg/mg), AF = Adherence Factor to Skin (mg/cm^2-event), ABSd = Dermal Absorption Fraction to Skin (unitless), SA = Skin Surface Area Available for Contact (cm^2), BW = Body Weight (kg), ABSGI = Gastrointestinal Absorption Factor (unitless)								
Exposure Group	**Body Weight (kg)**	**Age-Specific Exposure Duration (years)**	**Intake Rate (mg/day)**			**Adherence Factor to Skin (mg/cm^2-event)**	**Combined Skin Surface Area (cm^2)**	**Notes**
			CTE	**RME**	**Custom**			
6 weeks to < 1 year	8.2	1	60	100		0.2	1,772	
1 to < 2 years	11.4	1	100	200		0.2	2,299	
1 to < 2 years (pica)	11.4	NA	5,000	NA		0.2	2,299	
2 to < 6 years	17.4	4	100	200		0.2	2,592	
2 to < 6 years (pica)	17.4	NA	5,000	NA		0.2	2,592	
6 to < 11 years	31.8	5	100	200		0.2	3,824	
11 to < 16 years	56.8	5	100	200		0.2	5,454	
16 to < 21 years	71.6	5	100	200		0.2	6,083	
Adult	80	30	50	100		0.07	6,030	

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Skin Surface Areas (assuming shorts and short-sleeved shirts for children and adults, children go barefoot, adults wear shoes)

Residential Scenario

Use recommended mean skin surface areas or enter site-specific values. To use the default body parts provided, and include an additional value, you can add this to the "other" field. If you have different surface areas to include in your scenario, add them using a custom group.

Use default skin surface area for each body part

Exposure Group	Skin Surface Area by Body Part (cm^2)					Combined Skin Surface Area (cm^2)	Notes
	Head	Hands	Forearms	Lower Legs	Feet	Other		
6 weeks to < 1 year	727	211	247	329	258		1,772	
1 to < 2 years (standard)	870	300	311	488	330		2,299	
1 to < 2 years (pica)	870	300	311	488	330		2,299	
2 to < 6 years (standard)	585	348	457	739	463		2,592	
2 to < 6 years (pica)	585	348	457	739	463		2,592	
6 to < 11 years	660	510	680	1,244	730		3,824	
11 to < 16 years	730	720	1,022	1,932	1,050		5,454	
16 to < 21 years	750	830	1,211	2,172	1,120		6,083	
Adult	1,250	980	1,240	2,560	1,295		6,030	

Parcel A:
Chronic Exposure to Soil (ingestion and dermal, for cancer risk evaluation)

Exposure Group	Default Residential Scenario							
	Chronic Dose (mg/kg/day)		Chronic Hazard Quotient		Cancer Risk			
	CTE	RME	CTE	RME	CTE	ED (yrs)	RME	ED (yrs)
6 weeks to < 1 year	2.9E-05	3.9E-05	NC	NC	5.6E-6	0.88	1.1E-5	0.88
1 to < 2 years	3.1E-05	5.0E-05	NC	NC		1		1
2 to < 6 years	2.1E-05	3.4E-05	NC	NC		4		4
6 to < 11 years	1.4E-05	2.1E-05	NC	NC		5		5
11 to < 16 years	9.5E-06	1.3E-05	NC	NC		1		5
16 to < 21 years	8.1E-06	1.1E-05	NC	NC		0		5
Total exposure duration for child cancer risk						12		21
Adult	2.9E-06	4.3E-06	NC	NC	9.0E-7	12	3.6E-6	33
Birth to < 21 years + 12 years during adulthood	*Do not use this cancer risk unless you have a scenario where children are likely to continue to live in their childhood home as adults.*						1.3E-5	33

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Parcel A:
Chronic Exposure to Soil, Ingestion Only (for noncancer evaluation)

Exposure Group	Default Residential Scenario							
	Chronic Dose (mg/kg/day)		Chronic Hazard Quotient		Cancer Risk [§]			
	CTE	RME	CTE	RME	CTE	ED (yrs)	RME	ED (yrs)
POLYCHLORINATED BIPHENYLS (EPC: 2.14 mg/kg; Chronic MRL/RfD: NA; CSF: 2 (mg/kg/day)$^{-1}$)								
6 weeks to < 1 year	1.6E-05	2.6E-05	NC	NC	3.1E-6 [§]	0.88	7.5E-6 [§]	0.88
1 to < 2 years	1.9E-05	3.8E-05	NC	NC		1		1
2 to < 6 years	1.2E-05	2.5E-05	NC	NC		4		4
6 to < 11 years	6.7E-06	1.3E-05	NC	NC		5		5
11 to < 16 years	3.8E-06	7.5E-06	NC	NC		1		5
16 to < 21 years	3.0E-06	6.0E-06	NC	NC		0		5
Total exposure duration for child cancer risk						12		21
Adult	1.3E-06	2.7E-06	NC	NC	4.1E-7	12	2.3E-6 [§]	33
Birth to < 21 years + 12 years during adulthood	*Do not use this cancer risk unless you have a scenario where children are likely to continue to live in their childhood home as adults.*						8.4E-6 [§]	33

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Parcel B: Chronic Exposure to Soil (ingestion and dermal)

Exposure Group	Default Residential Scenario							
	Chronic Dose (mg/kg/day)		Chronic Hazard Quotient		Cancer Risk			
	CTE	RME	CTE	RME	CTE	ED (yrs)	RME	ED (yrs)
6 weeks to < 1 year	3.7E-06	5.0E-06	NC	NC	7.3E-7	0.88	1.5E-6	0.88
1 to < 2 years	4.0E-06	6.4E-06	NC	NC		1		1
2 to < 6 years	2.7E-06	4.3E-06	NC	NC		4		4
6 to < 11 years	1.8E-06	2.7E-06	NC	NC		5		5
11 to < 16 years	1.2E-06	1.7E-06	NC	NC		1		5
16 to < 21 years	1.0E-06	1.4E-06	NC	NC		0		5
Total exposure duration for child cancer risk						12		21
Adult	3.8E-07	5.5E-07	NC	NC	1.2E-7	12	4.6E-7	33
Birth to < 21 years + 12 years during adulthood	*Do not use this cancer risk unless you have a scenario where children are likely to continue to live in their childhood home as adults.*						1.6E-6	33

Source: exported Monday, May 14, 2018 from PHAST version 1.2.0.0, database rev 3.47.8

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City-Owned Right-of-Way – Recreational Exposure

Contaminant Information

Contaminant Name	Entered Concentration	Type	Converted Concentration	Dermal Absorption Fraction	GI Absorption Factor (dermal)	Bioavailability Factor
POLYCHLORINATED BIPHENYLS	0.529	Maximum	0.529 mg/kg	0.14	1	1

Soil/Sediment Combined; Chronic Exposure

Exposure Group	Site-Specific Scenario			
	Chronic Dose (mg/kg/day)	Chronic Hazard Quotient	Cancer Risk	ED (yrs)
POLYCHLORINATED BIPHENYLS (EPC: 0.529 mg/kg; Chronic MRL/RfD: NA; CSF: 2 (mg/kg/day)$^{-1}$)				
2 to < 6 years	1.9E-06	NC	4.5E-7	4
6 to < 11 years	1.3E-06	NC		5
11 to < 16 years	9.8E-07	NC		3
16 to < 21 years	8.5E-07	NC		0
Total exposure duration for child cancer risk				12
Adult	3.3E-07	NC	1.0E-7	12

EPC: exposure point concentration
MRL: Minimum Risk Level
RfD: reference dose
CSF: Cancer Slope Factor
Exposure: 5 days per week, 50 weeks per year for 12 years.

Source: exported Wednesday, May 16, 2018 from PHAST version 1.2.0.0, database rev 3.47.8

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Exposure Parameters

Soil Ingestion Exposure Dose Equation D = (C * IR * EF * CF) / BW D = Exposure Dose (mg/kg-day), C = Contaminant Concentration (mg/kg), IR = Intake Rate (mg/day), EF = Exposure Factor (unitless), CF = Conversion Factor (10-6 kg/mg), BW = Body Weight (kg)
Soil Dermal Absorbed Dose Equation DAD = (C * EF * CF * AF * ABSd * SA) / BW * ABSGI DAD = Dermal Absorbed Dose (mg/kg-day), C = Contaminant Concentration (mg/kg), EF = Exposure Factor (unitless), CF = Conversion Factor (10^{-6} kg/mg), AF = Adherence Factor to Skin (mg/cm^2-event), ABSd = Dermal Absorption Fraction to Skin (unitless), SA = Skin Surface Area Available for Contact (cm^2), BW = Body Weight (kg), ABSGI = Gastrointestinal Absorption Factor (unitless)

Exposure Group	Body Weight (kg)	Age-Specific Exposure Duration (years)	Intake Rate (mg/day)			Adherence Factor to Skin (mg/cm^2-event)	Combined Skin Surface Area (cm^2)	Notes
			CTE	RME	Custom			
2 to < 6 years	17.4	4			50	0.2	1,544	
2 to < 6 years (pica)	17.4	NA			5,000	0.2	1,544	
6 to < 11 years	31.8	5			50	0.2	2,434	
11 to < 16 years	56.8	3			50	0.2	3,674	
16 to < 21 years	71.6	0			50	0.2	4,213	
Adult	80	12			25	0.07	4,780	

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