ATSDR

Health Consultation

Southern Avenue Industrial Area Superfund Site

South Gate, Los Angeles County, California

USEPA Facility ID: CAN000905902

Final Release

November 19th, 2026

U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

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Agency for Toxic Substances and Disease Registry

Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. To prevent or mitigate exposures, a consultation may suggest specific actions, such as restricting the use of water, replacing water supplies, intensifying environmental sampling, restricting site access, or removing contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure 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 report concludes the health consultation process for this site, unless additional information is obtained by ATSDR. If the new information, in the agency's opinion, indicates a need to revise or append the conclusions previously issued, the consultation may resume.

You may contact ATSDR toll free at

1-800-CDC-INFO

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List of Abbreviations

$\mu g/m^3$	Micrograms per cubic meter
ATSDR	Agency for Toxic Substances and Disease Registry
CalEPA	California Environmental Protection Agency
CCR	California Cancer Registry
cis-1,2-DCE	cis-1,2-Dichloroethylene
COCs	Contaminants of concern
CREG	Cancer risk evaluation guide
CSF	Cancer slope factor
CV	Comparison value
1,2-DCA	1,2-Dichloroethane
DPM	Diesel particulate matter
DTSC	Department of Toxic Substances Control
EMEG	Environmental media evaluation guide (ATSDR)
IUR	Inhalation unit risk
MRL	Minimal risk level
NACCHO	National Association of County and City Health Officials
NCI	National Cancer Institute
NIOSH	National Institute for Occupational Safety and Health
NPL	National Priorities List
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethylene
PHA	Public health assessment
PHAGM	Public Health Assessment Guidance Manual
PHAP	Public Health Action Plan
REL	Reference exposure level
RfC	Reference concentration
RfD	Reference dose
RMEG	Reference dose media evaluation guide (ATSDR)
RSL	Regional screening level
SAIA	Southern Avenue Industrial Area
SL	Screening level
TCE	Trichloroethylene
TRI	Toxic Release Inventory
USEPA	U.S. Environmental Protection Agency
VOC	Volatile organic compound

1. Summary

This Health Consultation (HC) reviews environmental sampling data and analyzes whether people living or working near the Southern Avenue Industrial Area (SAIA) Superfund site could be harmed by past, present, or future exposures to contaminants from the Superfund site. This HC also evaluates whether former workers at the site might be at risk of harmful effects. SAIA is located in a mixed industrial, commercial, and residential area in South Gate, California. The U.S. Environmental Protection Agency (USEPA) found hazardous substances in soil, soil gas, and groundwater at SAIA in 2015 and 2016.

From 1972 to 2012, a facility occupied the site that manufactured hot-melt adhesive tape for laying carpet. Before 1972, the Pacific Screw Products Corporation made screw products at the property until the business went bankrupt. The main sources of contamination from those activities include concrete liners in the pallet manufacturing area, a sump, and an underground storage tank. Historical surveys and notices of violations by the Hazardous Waste Control Program with the Los Angeles County Department of Health Services also identified the use of trichloroethylene (TCE) on the property and the improper disposal of oils and solvents.

Based on USEPA's sampling from 2015 and 2016, soil, soil gas, and groundwater at SAIA are contaminated with TCE and other volatile organic compounds (VOCs). The full extent of groundwater contamination is still being investigated by EPA. Drinking water supply wells downgradient of SAIA are screened in a deeper water layer and are not currently contaminated. However, they could become contaminated in the future due to connections between the water layers (aquifers) beneath the surface. The high concentrations of VOCs found in soil gas and shallow groundwater could potentially migrate into indoor air through a process called vapor intrusion (ITSI Gilbane 2017a).

ATSDR investigated the SAIA site because the agency is required to evaluate exposure to hazardous waste at sites listed on USEPA's National Priorities List (NPL) of hazardous waste sites (i.e., Superfund sites.) More information about NPL sites is available from EPA.

ATSDR evaluated the site following the agency's public health assessment (PHA) process as described in ATSDR's Public Health Assessment Guidance Manual (PHAGM) (ATSDR 2022). This process is briefly summarized in Appendix E, with a more detailed description in the PHAGM resource page (Explanation of ATSDR's PHA Process.) ATSDR reached four conclusions based on a review of available environmental data provided by USEPA, information obtained during site work, and consultations with involved parties and the public.

Conclusion 1 At the time of sampling in 2015 and 2016, vapor intrusion was not a health concern in the eight sampled homes south of SAIA (between Southern Avenue, Duncan Way, Adella Avenue, and Salt Lake Avenue). While some VOCs were detected inside homes, their concentrations were low and not likely to harm people's health. Also, the VOCs in indoor air are probably not related to site contamination.

Basis for Conclusion 1

Benzene and 1,2-dichloroethane (1,2-DCA) were detected in indoor air samples collected in some residences in April 2015 and January 2016. ATSDR estimated cancer risk for residents based on breathing the highest concentration of benzene and 1,2-DCA found inside the eight homes during this time. The highest estimated cancer risk from the combined exposure to benzene and 1,2-DCA was one extra case of cancer for every 100,000 exposed persons. Most estimated cancer risks were in the 1 in a million range. These estimated cancer risks are very low and are not expected to be a concern for benzene and 1,2-dichloroethane (1,2-DCA).

All the other chemicals detected in indoor air in these residences were below cancer and noncancer screening levels (See Appendix B, Table B2.) Therefore, cancer and noncancer effects are not expected to be a concern for these other chemicals. Among residences not sampled, the risks of cancer and noncancer effects are unknown.

Benzene was found in indoor and outdoor air at similar concentrations. The concentrations were also similar to those typically found in residences across the United States. Benzene was also found in soil gas from outdoor soil samples. Benzene in indoor air could be from several sources:

- outdoor sources such as motor vehicles and nearby industry,
- indoor sources from commercial products (solvents and paint), or
- soil gas beneath buildings via migration known as vapor intrusion.

The VOC 1,2-DCA is not a site-related compound, but it is a very common indoor air pollutant. Indoor levels of 1,2-DCA in the eight sampled homes appear to be similar to outdoor levels. Indoor sources include consumer products made of plastic and vinyl, PVC pipes, furniture, upholstery, wall coverings, housewares, and automotive products.

Some uncertainty exists in these conclusions because indoor air concentrations can vary over time and might differ from those found in the two (2015 and 2016) sampling events reported in this assessment. Indoor air levels might be higher or lower in summer months compared to the January and April months when sampling was conducted.

Next Steps

ATSDR recommends that residents review the information on vapor intrusion included in this report. Residents can learn about steps they can take to improve indoor air quality, such as increasing ventilation when outdoor air quality is good, see: A Citizen's Guide to Vapor Intrusion. Local air conditions are reported at www.AirNow.gov. More information about vapor intrusion and indoor air quality is available online from ATSDR at Investigation Vapor Intrusion and PHA Curriculum VI.

Residents who have health or exposure concerns related to the contamination at SAIA can contact their health care provider and give them a copy of this health consultation.

Conclusion 2

Several VOCs have the potential to travel from ground to indoor air in some buildings via vapor intrusion. ATSDR cannot determine whether exposure to VOCs from vapor intrusion could have harmed the health of people in the following groups:

- Workers and trespassers in the former SAIA building
- Off-site workers in the ELG Metals building north of the SAIA site
- Off-site workers in buildings along Southern Avenue, across from SAIA
- Occupants in many unsampled residential and commercial buildings between Southern Avenue and Duncan Way who reside over contaminated groundwater (referred to as a groundwater plume)

Basis for Conclusion 2

VOCs (cis-1,2-dichloroethylene[cis-1,2-DCE]; tetrachloroethylene [PCE]; TCE; and vinyl chloride) have been found at elevated amounts in soil gas beneath these areas. These chemicals could potentially migrate from soil gas beneath the commercial, industrial, and residential buildings and into indoor air of those structures.

Indoor air data were not available to evaluate vapor intrusion for the former on-site building at SAIA, for businesses near SAIA, nor for residences near SAIA except for the eight residences that were sampled.

Therefore, ATSDR evaluated soil gas data for the potential of vapor intrusion in buildings located in the following areas:

- SAIA property,
- North of SAIA,
- Southern Avenue and the alleyway to the south between Southern Avenue and Duncan Way.

Buildings in these areas are above the groundwater plume. VOCs were detected in soil gas close to the northern boundary of the SAIA property that exceeded soil gas screening levels. VOC concentrations in soil gas measured between Southern Avenue and Duncan Way also exceed soil gas screening levels, indicating the potential for vapor intrusion inside residences and businesses between Southern Avenue and Duncan Way. No data were available to evaluate vapor intrusion concerns in businesses north of SAIA (e.g., ELG Metals) and immediately south of SAIA (along Southern Avenue).

Next Steps

ATSDR recommends the following actions:

- USEPA offer indoor air sampling for VOCs at the ELG Metals building located immediately north of SAIA, for businesses along Southern Avenue, and for businesses and residences from Southern Avenue south to Duncan Way
- Workers and residents review the information on vapor intrusion included in this public health assessment
- Employers, workers, and residents in these areas learn about steps they can take to improve indoor air quality, such as increasing ventilation with outdoor air when the air quality is good

Information about local air conditions can be found at www.AirNow.gov.

People from the following groups can contact their health care provider and give them a copy of this health consultation if they have exposure or health concerns related to contamination from SAIA:

- Workers in the former SAIA site building, ELG Metals building, and businesses along Southern Avenue south of SAIA
- Workers and residents who work or live south of SAIA from Southern Avenue to Duncan Way

Conclusion 3

Drinking water in South Gate is not expected to harm the health of people now or in the past because the municipal water is tested, monitored, and treated.

Basis for Conclusion 3

The drinking water for the City of South Gate comes from local groundwater wells that are much deeper than the shallow contaminated groundwater beneath and near the site. The South Gate Water Division regularly tests, monitors, and treats drinking water to ensure that municipal water meets all regulatory requirements before it is distributed to customers. Continued monitoring can help identify and reduce the potential for future exposures.

Next Steps

ATSDR recommends that the South Gate Water Division continue to:

- regularly test, monitor, and treat municipal drinking water as required by federal regulations and
- provide the community with annual water quality reports.

These steps support the continued safety of drinking water.

Conclusion 4	Exposure to on-site soil did not harm people's health in the past nor is it currently harming people's health because the site is mostly covered with pavement.
Basis for Conclusion 4	Pavement, some concrete slabs, and patches of gravel have covered the SAIA property since it was developed. Currently, a fence barrier is maintained around the site. The ground cover was a barrier to past exposure to on-site soil (i.e., breathing, touching, or swallowing contaminated soil) and along with fencing will prevent current and future exposure. Redevelopment or future construction activities on the property might expose soil gas or contaminated soil and could lead to exposure in the future. The selected future land use (industrial/commercial or residential) will determine the soil cleanup goals for safe use in the future. Continued maintenance of the surface coverage at the site can reduce the potential for future exposures.
Next Steps	ATSDR recommends that USEPA maintain current surface coverage and security measures (fencing) to support continued public safety. ATSDR recommends any future construction activities exposing contaminated soil be done under the oversight of USEPA, with safety measures in place to prevent exposure of workers and nearby residents. If future redevelopment activities require removal of the pavement, ATSDR recommends the site soils be investigated for hazardous waste.
For More Information	If you have questions about this public health consultation, you may contact ATSDR at 1-800-CDC-INFO.

2. Background

2.1. Statement of Issue and Purpose

This health consultation (HC) assesses whether people could be harmed from past, current, or future exposures related to the Southern Avenue Industrial Area (SAIA) Superfund site. The SAIA HC was initiated under ATSDR's Partnership to Promote Local Efforts to Reduce Environmental Exposure (APPLETREE). APPLETREE is a cooperative agreement program with state health departments to conduct health assessment activities. ATSDR finalized this health consultation report.

The investigation of the SAIA site included the evaluation of contaminants in soil, soil gas, groundwater, and indoor air. If exposures related to SAIA contamination present a health concern, ATSDR recommends actions to protect people's health. While reading this report, refer to Appendix A for additional figures and demographics of the surrounding area, and Appendix B for tables.

2.2. Site Description and Timeline

The SAIA Superfund site is located at 5211 Southern Avenue in the City of South Gate, Los Angeles County, California. SAIA is approximately 4 acres in size and mostly covered by concrete slabs and pavement (see Appendix A, **Error! Reference source not found.**A1). Currently, SAIA is vacant, but a roughly 70,000-square-foot structure and small storage shed had been located on the property. The main structure supported the manufacturing operations and provided merchandise storage for the manufacturers that operated at SAIA. These buildings were demolished and removed in the fall of 2013. Concrete remnants of an above ground storage tank in the northern portion of SAIA and an underground sump in the southern portion of SAIA are still present. A chain-link fence encloses the entire property. Since 2013, the property has been occasionally used as a commercial truck parking lot. Graffiti indicates occasional trespassing.

From 1942 to 1972, Pacific Screw Products Corporation (1942 to 1951) and then Screw Products of America (1951 to 1972) manufactured screw products at SAIA. Solvents were used to clean fabricated metal screws (WSI 2003). From 1972 to 2013, Bruck Industries (1972 to 1981) and then Seam Master Industries (1981 to 2013) manufactured hot-melt adhesives at the site (WSI 2003).

USEPA discovered environmental contamination at SAIA while conducting a remedial investigation for the Cooper Drum Superfund site, located approximately 400 feet northwest of SAIA (WSI 2003). Part of the Cooper Drum remedial investigation included the collection of groundwater samples at SAIA. Groundwater samples collected beneath SAIA in 2002 revealed elevated levels of volatile organic compounds (VOCs), specifically trichloroethylene (TCE). USEPA collected additional groundwater samples and determined that the VOCs detected beneath SAIA were separate from Cooper Drum and had originated from releases at SAIA. USEPA initially asked that the California Department of Toxic Substances Control (DTSC) oversee cleanup activities at SAIA. However, the SAIA property owner and DTSC were not able to enter into a consent order to clean the contamination. In 2007, DTSC asked USEPA to take leadership and facilitate cleanup at SAIA (U.S. EPA 2011a).

Since the 2002 Cooper Drum Remedial Investigation report, additional environmental investigations have been conducted at SAIA, including the following:

- A 2002 Phase I Environmental Site Assessment conducted by subcontractors of the SAIA property owner
- A 2003 Preliminary Assessment/Site Inspection Report conducted by USEPA contractors
- A 2007 site evaluation conducted by contractors of the SAIA property owner
- A remedial investigation conducted by USEPA in 2012
- Soil and soil gas investigations by USEPA in 2013, 2014, and 2017
- Residential indoor air investigations by USEPA in 2015 and 2016
- Annual groundwater monitoring sampling investigations by USEPA during 2013–2017 (WSI 2003, SGI 2002, ITSI Gilbane 2010).

On May 10, 2012, USEPA added the SAIA site to its National Priorities List (NPL). The NPL is a list of hazardous waste sites eligible for federal funds to carry out site cleanup activities for the Superfund Program. USEPA investigates these NPL sites to determine if they pose risks to public health or the environment, and works to eliminate those risks, whenever possible. USEPA has been the lead agency at SAIA since 2007.

3. Community Demographics

SAIA is located within Census Tract 5361.04 in Los Angeles County. The site spans approximately 0.8 square miles on the east end of South Gate. The tract has a population of approximately 3,900 people, 40% of whom live below the federal 150% poverty level. The reported 2020 median household income was $60,885. The ethnic makeup is roughly 93.7% Hispanic or Latino (of any race) and 6.3% not Hispanic or Latino. The population density within one mile radius of SAIA is approximately 5,404 people per square mile (see Appendix A.).

According to the 2020 American Community Survey, 86.7% of households in Census Tract 5361.04 are limited English-speaking households; 84% of residents indicated that they speak Spanish at home.

Low-income and minority populations are more likely to live in communities with high amounts of environmental stressors and may be at greater risk from environmental hazards. The California Office of Environmental Health Hazard Assessment developed a science-based tool, the California Communities Environmental Health Screening Tool (CalEnviroScreen), which calculates a numerical score for an individual California community based on the community's specific pollution burdens and population characteristics (OEHHA 2026a, OEHHA 2026b). CalEnviroScreen uses socioeconomic, demographic, and environmental data to determine a community's score down to the census tract level. Communities in the top 10% may potentially be at greatest risk for environmental stressors and hazards in California.

Using CalEnviroScreen v4.0, the pollution burden scores for the South Gate census tracts are among the state's top 5 to 10% of scores (OEHHA 2026c). The socioeconomic factors driving the scores are the level of education, linguistic isolation, and poverty. The environmental factors

driving the scores are air quality, threats to drinking water, the number of hazardous waste sites, and the number of solid waste facilities (OEHHA 2026d).

3.1.1. Community Assets

The City of South Gate is committed to positive growth and enhancing the quality of life for all residents by offering programs for community members of all ages (CSG 2009). For example, the large, well-maintained South Gate Park includes a senior center, civic center, and Girls Club House. The city also supports community development programs that revitalize areas. Protective zoning laws ensure future industrial operations maintain proper distances from residential communities, and housing assistance programs support affordable housing and fair housing practices. South Gate residents and leaders have also mobilized to address a wide range of health and environmental concerns.

3.1.2. Land Use

SAIA is located within an industrial and residential mixed area of South Gate. To the east, SAIA is bound by an unused railroad track; to the west lies the Bimbo Bakeries facility; to the south, Southern Avenue, and to the north, the ELG Metals facility (**Error! Reference source not found.** in Appendix A provides an aerial view). Several businesses are located across Southern Avenue, south of SAIA, including an auto accessories and parts store. An alleyway runs between these businesses and the residential area.

4. Scientific Evaluation

4.1. Exposure Pathway Analysis

This section describes how people might come into contact with SAIA contaminants. For a person to be exposed, the contaminant must be in direct contact with that person, either by breathing, touching, or ingesting. An exposure pathway consists of five parts:

1. Source of contamination (hazardous waste)
2. Contaminated environmental medium (air, soil, water, food)
3. Location where someone contacts the contaminated medium (such as inside a home or business)
4. Exposure route, such as inhalation (breathing), skin absorption (skin contact, touching), or ingestion (swallowing or eating)
5. Person or group that might be exposed

All five parts must be present for an exposure pathway to be "complete." The exposure pathway is designated as potential if one or more components are not present. If an evaluation determines that one or more of the five parts of an exposure pathway will never be present, then the pathway is eliminated and further evaluation of that pathway is not needed. If no completed or potential exposure pathways are identified, public health hazards will not exist (ATSDR 2022).

Exposures pathways at the SAIA site are described below and illustrated in Appendix A, **Error! Reference source not found.**.

4.1.1. Completed Exposure Pathways

One completed exposure pathway was identified for which all five parts are present:

1. Source: VOC contamination in groundwater at SAIA
2. Media: Contaminated indoor air in homes from migrating groundwater that resulted in vapor intrusion of VOCs from soil gas to indoor residential air
3. Exposure point: Contact with the contaminants in air inside residences
4. Exposure route: Inhalation (breathing) of indoor air
5. Exposed person/group: Residents living near the site in the direction of groundwater flow

The completed pathway includes past, current, and future exposures for residents who breathe indoor air contaminated by vapor intrusion. Note that indoor air sampling is required to evaluate this pathway because vapor intrusion can differ from building to building (ATSDR 2016). USEPA provided indoor air data for eight off-site homes south of SAIA.

4.1.2. Potential Exposure Pathways

We considered four exposure pathways to be potential because information about one part of the exposure pathway was missing:

1. Past exposure for workers breathing indoor air inside the former SAIA building (no indoor air data available).
2. Past exposure for trespassers breathing air inside the former SAIA building (no indoor air data available).
3. Past, current, and future exposure of workers breathing indoor air inside the ELG Metals building and other off-site businesses on Southern Avenue (no indoor air data available).
4. Future exposure for workers and residents breathing indoor air in buildings and structures that might be built on the SAIA property (no indoor air data available.)
5. Future exposure of workers to on-site soils from building activities on the SAIA property.

4.1.3. Eliminated Exposure Pathways

Two pathways were eliminated for which exposure is unlikely, and there is no need for further evaluation:

1. Past, current, and future exposure for South Gate residents from contaminated drinking water.
2. Past and current exposure from contaminated on-site soils.

4.2. Environmental Sampling Data

The following section discusses the environmental sampling data used to evaluate the exposure pathways, including the reasons why certain pathways were eliminated from further evaluation.

4.2.1. Groundwater

Groundwater is water that sinks from the surface into the ground, gradually descending between soil particles, and pools between the soil particles. When sufficient amounts of water collect between soil particles, the soil is saturated with water and is known as an aquifer.

Small pools of contaminated groundwater are found beneath the site within the first roughly 50 feet depth from the site's surface. The depth to contaminated groundwater is about 8 to 10 feet. The Gaspur Aquifer starts at a depth of approximately 50–70 feet and extends to about 110–120 feet below the surface. The Exposition Aquifer underlies the Gaspur. It starts at a depth of roughly 120 feet and extends to 220–240 feet depth below the surface (ITSI Gilbane 2018).

Groundwater sampling results were provided by USEPA in technical memorandum reports (ITSI Gilbane 2010, 2017, 2018). USEPA found that the high concentrations of TCE and 1,2-dichloroethylene (1,2-DCE) in the plume (contaminated groundwater) beneath SAIA were typical of the concentrations found in nearby VOC plumes extending from other sources in the area (ITSI Gilbane 2017). The other plumes come from the Cooper Drum and Jervis B Webb Superfund sites and an unidentified source beneath the Legacy High School Complex (located south of SAIA). The VOC plumes from Cooper Drum, Jervis B Webb, and SAIA have combined downgradient to the south from SAIA. **Error! Reference source not found.** in Appendix A shows a map of the estimated positions of the groundwater plumes in the area. In addition to the shallow aquifer, both the Exposition and Gaspur aquifers are contaminated (ITSI Gilbane 2010).

4.2.2. Drinking Water

South Gates' drinking water is not contaminated by SAIA. The City of South Gate gets its drinking water from local groundwater wells that are much deeper than the groundwater that has been contaminated by these industrial sites. SAIA-related contamination is not currently affecting, nor has it affected, the city's groundwater wells in the past.

The City of South Gate Water Division ensures that the public's drinking water is safe to drink by regularly testing, monitoring, and (if necessary) treating the water in its municipal water wells. Water quality reports describing their results are available on the city's website at www.cityofsouthgate.org (CSG 2015).

4.2.3. Soil

ATSDR defines surface soil as soil within the top 3 inches. However, the SAIA site is covered by pavement, concrete, or gravel; thus, soil samples could only be collected from a depth of 0.5 feet and deeper. People walking or playing on the site will not have contact with contaminated soil below the pavement, gravel, or concrete.

Overall, soil samples collected by USEPA indicate the following:

- Soil contamination beneath the paved areas appears to be concentrated in the northern and eastern portions of SAIA and limited to shallow depths.
- Aluminum, arsenic, cobalt, iron, magnesium, and vanadium were detected at elevated concentrations at nearly all sampling locations (ITSI Gilbane 2022). Elevated levels of lead were found to be concentrated in the northeastern portion of SAIA.
- VOCs, semivolatile organic compounds, and polychlorinated biphenyls (PCBs) were found at levels higher than ATSDR screening levels (ATSDR 2016).
- Elevated concentrations of PCBs and semivolatile organic compounds were limited to shallow soil depths on the eastern portion of SAIA. PCB and semivolatile compounds do not extend beyond the eastern boundary of SAIA.

- High concentrations of VOCs were found in soil samples on the eastern side of SAIA, consistent with elevated soil gas results from the same area (ITSI Gilbane 2014).

Pavement, concrete slabs, and some gravel have covered the SAIA property since it was developed. In addition, the site is currently securely fenced. These features eliminate any past, current, or future routes of exposure to on-site surface soil (i.e., breathing, touching, or swallowing contaminated soil or surface dust). However, future redevelopment activities on the property could bring contaminated soil to the surface, potentially resulting in a completed exposure pathway. The selected future land use (industrial/commercial or residential) will determine the cleanup goals for soil to support safe use in the future. This report did not evaluate soil exposures further because there is no past, present, or likely future completed exposure pathway to contaminants in soil.

What is Vapor Intrusion?

Vapor intrusion occurs when chemicals in the ground (soil) or in groundwater evaporate and the resulting chemical vapors move through tiny air pockets in the soil. Air pockets in the soil are called soil gas. Chemical vapors mix with the soil gas, travel upward through the soil and enter buildings or homes through cracks in the concrete slab, foundation, floor, sewer lines, or other openings. Once inside, the chemical vapors can accumulate and contaminate the indoor air.

Appendix A, Figure A5 shows how contamination in the ground can enter nearby homes or buildings. Many factors influence whether soil gas can enter a building:

- The soil type and how wet the soil is (moisture content)
- The air conditioning/heating settings in the building
- How ventilated the building is (open windows/doors)
  The type and condition of the floor (presence of a basement, crawl space, or slab on grade, how many cracks in the concrete, holes for utilities).

4.2.4. Soil gas

Soil gas data indicate the possibility for vapor intrusion in on-site and off-site areas. Appendix A, Figures A6 and A7 show soil gas sample locations (ITSI Gilbane 2014). The red dots indicate where VOCs collected from soil gas boring samples measured at levels above California residential and industrial screening levels (and ATSDR's soil gas comparison levels [CVs]). The yellow dots point to where VOCs in soil gas samples were found at levels above only ATSDR soil gas CVs or California residential screening levels. The following soil gas samples were used to evaluate potential vapor intrusion exposures in different areas on and off the site:

- On-site soil gas borings SAIA-SB/SG1-12 and SAIA-SB/SG19-35
- Off-site north of SAIA on the ELG Metals property soil gas borings SAIA-SB/SG18 and SAIA-SB/SG36-39
- Off-site east of SAIA across the railroad tracks soil gas borings SAIA-SB/SG44-47
- Off-site nearby businesses and residences south of SAIA soil gas borings SAIA-SB/SG13-17 and SAIA-SB/SG40-43

4.2.4.1. On-Site SAIA Soil Gas

Many of the VOCs found in the on-site soil gas samples (SAIA-SB/SG1-12, SAIA-SB/SG19-35) exceed residential and industrial screening levels. The highest concentrations of VOCs detected among all on-site sampling depths were found in the northeast portion of SAIA, around the source areas. These are areas with sumps and chemical storage, and areas where degreasing occurred. The lowest concentrations were found in the northwest portion of the site and the southern portions along Southern Avenue (see Appendix A, Figure A6.)

The most prevalent VOCs detected on site are TCE, PCE, cis-1,2-DCE, and vinyl chloride.

- Elevated TCE concentrations were detected in soil gas above California commercial (industrial) screening levels (187 microgram per cubic meter [µg/m³]). Soil gas concentrations ranged from 200 µg/m³ at a depth of 15 feet to 7,800,000 µg/m³ at 35 feet.
- Elevated PCE concentrations were detected in soil gas above California commercial screening levels (174 µg/m³). Soil gas concentrations ranged from 190 µg/m³ at a depth of 5 feet to 42,000 µg/m³ at 25 feet.
- Elevated cis-1,2-DCE concentrations were detected in soil gas above California commercial screening levels (2,739 µg/m³). Soil gas concentrations ranged from 3,000 µg/m³ at a depth of 35 feet to 9,100,000 µg/m³ at 25 feet.
- Elevated vinyl chloride concentrations were detected in soil gas above California commercial screening levels (70 µg/m³). Soil gas concentrations ranged from 73 µg/m³ to 6,100,000 µg/m³ at a depth of 25 feet. (ITSI Gilbane 2017b).

The soil gas concentrations also exceeded ATSDR's CVs for TCE (7 µg/m^3), PCE (130 µg/m^3), and vinyl chloride (3.7 µg/m^3), which were developed for residential exposure. ATSDR does not have a soil gas CV for cis-1,2-DCE nor does ATSDR develop CVs for commercial scenarios.

Currently, there are no buildings on the SAIA property. However, elevated VOCs detected in on-site soil gas samples, particularly those found at shallow depths (5 feet), indicate that vapor intrusion could have affected the air inside former buildings on the site. The gases might have entered through preferential pathways such as cracks in the slab, floor, or openings in the sewer and utility lines. See Appendix B, Table B1 for maximum concentrations detected in shallow soil gas in on-site soil that exceed California's commercial soil gas screening levels for vapor intrusion.

4.2.4.2. Upgradient Off-Site Soil Gas at ELG Metals Property

USEPA collected five off-site soil gas samples on the ELG Metals property (SAIA-SB/SG18, SG36-39), which is located just north of SAIA and upgradient to groundwater flow (Appendix A, **Error! Reference source not found.**). Four of the five samples were collected outside the ELG Metals building (SAIA-SB/SG18, SG36-38) and one sample was collected from inside the building (SAIA-SB/SG39) (Appendix A, Figure A6).

Among all five soil gas samples collected, the highest VOC concentrations were found in the deeper sample depths (at 25 and 35 feet) compared to samples collected near areas historically associated at SAIA with chemical storage, sumps, and degreasing activities. Maximum concentrations found in soil gas were

- TCE at 940,000 µg/m^3,
- PCE at 3,100 µg/m^3,
- cis-1,2-DCE at 1,100,000 µg/m^3, and
- vinyl chloride at 52,000 µg/m^3.

The VOC concentrations found in samples collected further east and away from the ELG Metals building were much lower. Only TCE was detected in the soil gas sample collected furthest east from the ELG building (at 35 feet depth, at a concentration of 80 µg/m^3) (ITSI Gilbane 2015).

Given the elevated concentrations of VOCs found in soil gas samples in and near the building, vapor intrusion could be impacting the air inside the ELG Metals building.

4.2.4.3. Off-Site Soil Gas East of the SAIA Property across the Railroad Tracks

To characterize the eastward movement of on-site contaminants, USEPA collected off-site soil gas samples to the east and northeast of the SAIA property (SAIA-SB/SG44-47). See Appendix A, Figure A6 for soil gas sample locations. This area is directly across the railroad tracks, and along the western edge of a large concrete drainage structure, which is part of the Los Angeles County storm drain system (East Compton Creek No. 1.) This property is owned by Bell Foundry at 5311 Southern Avenue, further east from the site and is used as a parking lot for commercial vehicles.

The highest VOC concentrations were found at the deepest sampling depth of 35 feet below the surface. The concentrations, however, were about three to four times lower than the highest VOC concentrations found on site:

- TCE detections ranged from 40 µg/m^3 to 16,000 µg/m^3 (35 feet depth)
- Cis-1,2-DCE detections ranged from 7 µg/m^3 to 1,900 µg/m^3 (35 feet depth)
- Vinyl chloride detections ranged from 20 µg/m^3 to 50 µg/m^3 (35 feet depth)

Among samples collected close to the surface (at 5 feet depth), most VOC concentrations were below detection limits. The large concrete drainage structure could be acting as a physical barrier, limiting the shallow movement of VOCs to the east and northeast of the SAIA boundary (ITSI Gilbane 2017b). USEPA detected low VOC concentrations in a groundwater sample from the Bell Foundry property, indicating that the extent of the VOC contamination reaches slightly east of these soil gas locations (ITSI Gilbane 2017b). Given the low VOC concentrations in shallow soil gas and the use of the Bell Foundry property as a parking lot, vapor intrusion is not expected to be a concern for the area east of SAIA.

4.2.4.4. Downgradient Off-Site Soil Gas Near Businesses and Residences

USEPA collected soil gas samples at nine downgradient off-site locations near businesses and residences immediately south of SAIA. See Appendix A, Figure A7 for soil gas sample locations. Samples were collected

- along the site's southern fence line on the north side of Southern Avenue (SAIA-SB/SG13, SAIA-SB/SG 14),
- in an alleyway south of Southern Avenue (SAIA-SB/SG15, SAIA-SB/SG 16, SAIA-SB/SG 40),

- along McCallum Avenue (SAIA-SB/SG17, SAIA-SB/SG 41), and
- further into the neighborhood along Duncan Way (SAIA-SB/SG42, SAIA-SB/SG 43).

Table 1Table 1 shows that VOCs (TCE, cis-1,2-DCE, PCE, and vinyl chloride) were found at levels well-above screening levels in the two sampling locations on the north side of Southern Avenue along the site's southern fence line (SAIA-SB/SG13, SAIA-SB/SG14). The highest PCE concentration was 3,600 µg/m^3 at a depth of 15 feet. The highest TCE concentration was 570 µg/m^3 at a depth of 35 feet. These samples indicate VOCs are migrating from the SAIA southern boundary towards the businesses and neighborhood south of the site.

Table 1. Soil gas results from along the north side of Southern Avenue

Soil Gas Sample ID	Sample Depth in feet	Sample Month & Year	PCE in µg/m^3	TCE in µg/m^3	Cis-1,2-DCE in µg/m^3	Vinyl chloride in µg/m^3
SAIA-SB/SG13	5	April 2013	2,900	61	180	53
SAIA-SB/SG13	15	April 2013	3,600	110	160	35
SAIA-SB/SG13	25	April 2013	61	43	<40	<13
SAIA-SB/SG13	35	April 2013	550	290	72	<13
SAIA-SB/SG14	5	April 2013	46	110	<40	<13
SAIA-SB/SG14	15	April 2013	<34	35	<40	<13
SAIA-SB/SG14	25	April 2013	140	480 J	230 J	18
SAIA-SB/SG14	35	April 2013	<34	570	150	<13
ATSDR Soil Gas CV	—	—	**130**	**7**	**No CV**	**3.7**

Abbreviations: µg/m^3 = micrograms per cubic meter; ATSDR = Agency for Toxic Substances and Disease Registry; CV = comparison value; ID = identifier; PCE = tetrachloroethylene; SAIA = Southern Avenue Industrial Area; SB/SG = soil boring/soil gas; TCE = trichloroethylene, "<" indicates the value is below the laboratory detection limit (ITSI Gilbane 2017), "J" qualifier indicates estimated concentration.

Table 2 shows only TCE and cis-1,2-DCE were detected in the two soil gas samples collected farthest south from the site (SAIA-SB/SG42, SAIA-SB/SG43) along Duncan Way (roughly 700 feet south of the site). The TCE levels detected (53 µg/m^3 and 55 µg/m^3) were much less than those found closer to the site, showing that VOCs in soil gas are decreasing in concentration as they move further south from the site. Although TCE and vinyl chloride were not detected at most depths, the laboratory detection levels are greater than the ATSDR comparison values for TCE and vinyl chloride.

Table 2. Soil Gas Results along Duncan Way.

Soil Gas Sample ID	Sample Depth in feet	Sample Month & Year	PCE in µg/m³	TCE in µg/m³	cis-1,2-DCE in µg/m³	Vinyl chloride in µg/m³
SAIA-SB/SG42	5	May 2014	<34	53	190	<13
SAIA-SB/SG42	15	May 2014	<34	<27	<40	<13
SAIA-SB/SG42	25	May 2014	<34	<27	<40	<13
SAIA-SB/SG42	35	May 2014	<34	<27	<40	<13
SAIA-SB/SG43	5	May 2014	<34	55	62	<13
SAIA-SB/SG43	15	May 2014	<34	<27	<40	<13
SAIA-SB/SG43	25	May 2014	<34	<27	60	<13
SAIA-SB/SG43	35	May 2014	<34	<27	<40	<13
ATSDR Soil Gas CV	—	—	**130**	**7**	**No CV**	**3.7**

Abbreviations: µg/m³ = micrograms per cubic meter; ATSDR = Agency for Toxic Substances and Disease Registry; CV = comparison value; ID = identifier; PCE = tetrachloroethylene; SAIA = Southern Avenue Industrial Area; SB/SG = soil boring/soil gas; TCE = trichloroethylene. "<" indicates the value is below the laboratory detection limit (ITSI Gilbane 2015).

For the evaluation of businesses along Southern Avenue, data from soil gas samples collected along the alleyway (SAIA-SB/SG15, SAIA-SB/SG 16, SAIA-SB/SG 40) just south of the site showed the following maximum concentrations (see Table 3):

- TCE at 880 µg/m³ (25 feet depth),
- PCE at 1,600 µg/m³ (25 feet depth), and
- cis-1,2-DCE at 900 µg/m³ (35 feet depth).

Vinyl chloride was not found above laboratory detection levels at any depth; however, the laboratory detection level (13 µg/m³) exceeds ATSDR comparison values (3.7 µg/m³.)

Table 3 shows that in soil gas samples collected at 5 feet, TCE concentrations ranged from less than laboratory detection levels to 200 µg/m³, PCE from 250 µg/m³ to 750 µg/m³, and cis-1,2-DCE detections from less than laboratory detection levels (40 µg/m³) to 410 µg/m³. These results show that the groundwater contamination plume is migrating into commercial areas.

Table 3. Soil gas results along the alleyway at SAIA.

Soil Gas Sample ID	Sample Depth in Feet	Sample Month & Year	PCE in µg/m^3	TCE in µg/m^3	cis-1,2-DCE in µg/m^3	Vinyl chloride in µg/m^3
SAIA-SB/SG15	5	April 2013	750	<27	<40	<13
SAIA-SB/SG15	15	April 2013	810	32	<40	<13
SAIA-SB/SG15	25	April 2013	1,600	460	<40	<13
SAIA-SB/SG15	35	April 2013	1,200	580	<40	<13
SAIAI-SB/SG16	5	April 2013	390	110	120	<13
SAIAI-SB/SG16	15	April 2013	820	72	55	<13
SAIAI-SB/SG16	25	April 2013	1,100	880	870	<13
SAIAI-SB/SG16	35	April 2013	610	170	<40	<13
SAIA-SB/SG40	5	May 2014	240	200	410	<13
SAIA-SB/SG40	15	May 2014	330	140	340	<13
SAIA-SB/SG40	25	May 2014	1,200	380	200	<13
SAIA-SB/SG40	35	May 2014	<34	430	900	<13
ATSDR Soil Gas CV	—	—	**130**	**7**	**No CV**	**3.7**

Abbreviations: µg/m^3 = micrograms per cubic meter; ATSDR = Agency for Toxic Substances and Disease Registry; CV = comparison value; ID = identifier; PCE = tetrachloroethylene; SAIA = Southern Avenue Industrial Area; SB/SG = soil boring/soil gas; TCE = trichloroethylene. "<" indicates the value is below the laboratory detection limit (ITSI Gilbane 2015, 2014).

Samples from the alleyway (SAIA-SB/SG40, SAIA-SB/SG15, SAIA-SB/SG116); McCallum Avenue (SAIA-SB/SG17, SAIA-SB/SG 41); and Duncan Way (SAIA-SB/SG 42, SAIA-SB/SG 43) were used to evaluate the residential area south of the site (see Tables 2, 3, and 4.)

- In the alleyway (Table 3) and on McCallum Avenue (Table 4), vinyl chloride was not detected at depths of 5, 15, or 25 feet. However, one sample detected vinyl chloride at 35 feet depth on McCallum Avenue (27 µg/m^3.)
- The highest concentrations of cis-1,2-DCE (5,100 µg/m3) and TCE (6,800 µg/m^3) were found at a depth of 5 feet (SAIA-SB/SG41) and 35 feet (SAIA-SB/SG17), respectively, on McCallum Avenue.
- PCE was detected in shallow soil gas at nearly all sampling locations in the alleyway and along McCallum Avenue ranging up to 1,600 µg/m^3.

- TCE and cis-1,2-DCE were either not detected or detected at low concentrations in shallow soil gas collected along Duncan Way.
- Although, vinyl chloride was not detected in Duncan Way soil gas samples, the laboratory detection limit for vinyl chloride (13 µg/m^3) is above the ATSDR comparison value (3.7 µg/m^3) (Table 2).

These results indicate that vapor intrusion could be a concern for the businesses and residences just south of SAIA between Southern Avenue to Duncan Way. The lower VOC concentrations in soil gas samples collected furthest south of SAIA (along Duncan Way) suggest that vapor intrusion is less likely to be a concern in that area.

In response to the soil gas sample results, USEPA pursued collecting indoor air samples from the businesses near the site but was unable to gain access to the businesses along Southern Avenue. ATSDR recommends businesses allow indoor air sampling.

Table 4. Soil gas results along McCallum Avenue

Soil Gas Sample ID	Sample Depth in Feet	Sample Month & Year	PCE in µg/m^3	TCE in µg/m^3	cis-1,2-DCE in µg/m^3	Vinyl chloride in µg/m^3
SAIA-SB/SG17	5	April 2013	190	82	<40	<13
SAIA-SB/SG17	15	April 2013	210	39	<40	<13
SAIA-SB/SG17	25	April 2013	1,400	1,700	270	<13
SAIA-SB/SG17	35	April 2013	480	6,800	3,000	27
SAIA-SB/SG41 (a)*	5	May 2014	<34	51	<40	<13
SAIA-SB/SG41 (b)*	5	May 2014	50 J	6,000	5,100	<30
SAIA-SB/SG41	15	May 2014	45	94	160	<13
SAIA-SB/SG41	25	May 2014	<34	34	60	<13
SAIA-SB/SG41	35	May 2014	<34	<27	69	<13
ATSDR Soil Gas CV	—	—	**130**	**7**	**No CV**	**3.7**

Abbreviations: µg/m^3 = micrograms per cubic meter; ATSDR = Agency for Toxic Substances and Disease Registry; CV = comparison value; ID = identifier; PCE = tetrachloroethylene; SAIA = Southern Avenue Industrial Area; SB/SG = soil boring/soil gas; TCE = trichloroethylene, "<" indicates the value is below the laboratory detection limit (ITSI Gilbane 2015, 2014), "<," indicates the value is below the lab detection limit (ITSI Gilbane 2015, 2014). "J" qualifier indicates estimated concentration.

* SAIA-SB/SG41a and SAIA-SB/SG41b are duplicate samples with two results. Results from both samples are shown. The higher result was used in the evaluation because that is more health protective. From the reports available, we could not determine why the results for TCE and cis-1,2-DCE in the duplicate samples were so different.

4.2.5. Residential Indoor Air

Given that the VOC concentrations in soil gas samples exceeded ATSDR, California, and USEPA residential screening levels, the USEPA gained permission from eight households located immediately south of the site to have their indoor air sampled over multiple days during two different periods. The first sampling event occurred in April 2015, while the second sampling event occurred in January 2016. USEPA collected indoor air samples in two different seasons to account for seasonal differences, such as opening windows or the use of heaters, which can affect vapor intrusion (U.S. EPA 2011a, ATSDR 2017). None of the homes sampled were equipped with central air heating or air conditioning systems. The home residents reported using either wall heaters or portable heaters to generate heat in the winter. For the summer, the residents reported using ceiling fans, opening windows, and in two homes using a window-mounted air conditioning unit to generate cool air (for one room). Two of the homes sampled have crawl spaces, and none of the homes have basements.

One indoor air sample was collected in each home for the two sampling events. All indoor air samples were obtained on the first floor, from a highly travelled room such as the living room, dining room, or bedroom. USEPA also collected two outdoor air samples. Access limitations prevented investigations in other homes. For privacy concerns, USEPA did not disclose the addresses of the sampled homes. See Appendix B, Table B2, for indoor air sampling results for the eight households sampled.

VOCs in indoor air can come from sources other than vapor intrusion, including consumer products brought into the home, building materials used for constructing the home, home repairs, and outdoor air migrating indoors. The presence of indoor and outdoor sources of VOCs is a challenge when investigating vapor intrusion because it can be difficult to distinguish between these sources and vapor intrusion from contaminated soil gas beneath a property (USEPA 2011b). Indoor air concentrations can also vary by location within buildings and can vary over time. The following VOCs exceeded the residential screening levels for indoor air: 1,2-DCA and benzene. See section 3.4 and 3.5 below for an evaluation of health risks associated with VOCs detected in indoor air.

4.2.5.1. Sampling Indoor Air with Radiello Passive/Diffusive Samplers

USEPA used a type of passive sampling device called Radiellos to collect indoor air samples. To ensure that the method of passive air sampling would be sufficient to assess exposure and health outcomes for this PHA, ATSDR evaluated the advantages and limitations of using Radiello samplers (see Appendix D). Based on this evaluation, we considered the Radiello data to be valid and used them in this PHA.

4.3. Environmental Screening Methods

The following section briefly discusses the method used to identify and evaluate whether potential contaminants of concern (COCs) could pose a health hazard.

4.3.1. Use of Indoor Air Data to Evaluate Vapor Intrusion Concerns

Measured contaminant concentrations in air were compared with residential screening levels (SLs) for air. Contaminants that exceed the SL are identified as potential COCs and are evaluated further to determine if harmful effects might be possible.

The SLs are concentrations in air that are unlikely to cause cancer or noncancer health effects if exposures last for a long time. Agencies like ATSDR, USEPA, and the California Environmental Protection Agency (CalEPA) publish SLs, thus a chemical can have several SLs. The SL for each chemical came from one of the following sources:

- Cancer risk evaluation guide (CREG) — ATSDR's CREGs are media-specific comparison values (CVs) that identify concentrations of cancer-causing substances that are unlikely to result in a significant increase in cancer risk in a population exposed over a lifetime. CREGs are derived from USEPA's cancer slope factors (CSF), which indicate the relative potency of cancer-causing chemicals (ATSDR 2022, ATSDR 2017).

- Environmental media evaluation guide (EMEG) — ATSDR's EMEGs are estimates of chemical concentrations in air, soil, and water that are not likely to cause an appreciable risk of harmful noncancer health effects for specified durations of exposure. EMEGs are determined for three durations of exposure: acute (1–14 days), intermediate (15–364 days), and chronic (365 or more days). EMEGs are based on ATSDR's minimal risk levels (MRLs) (ATSDR 2022).

- Reference exposure levels (RELs) and reference concentrations (RfCs) — CalEPA's Office of Environmental Health Hazard Assessment's RELs and USEPA's RfCs are estimates of chemical concentrations in air that are not likely to cause an appreciable risk of harmful noncancer health effects for specified durations of exposure (CDTSC 2018, USEPA 2018).

- Regional screening levels (RSLs) — USEPA's RSLs are concentrations used in initial screening evaluations of environmental measurements and can be based on noncancer or cancer outcomes (USEPA 2018).

VOCs identified as potential COCs in indoor air and evaluated for potential health effects included 1,2-DCA and benzene because their indoor air concentrations exceeded one of the previously described screening levels (see Appendix B, Table B2).

4.3.2. Use of Soil Gas and Indoor Air Data to Evaluate Vapor Intrusion

Vapor intrusion concerns were evaluated based on different types of data using a "multiple lines of evidence" approach (USEPA 2011a, ATSDR 2016). These data include samples collected under the building (sub-slab), in crawl spaces, in soil gas beneath a building or below the surface, and from indoor and outdoor air. Sampling across multiple seasons accounts for the effect of seasonal changes in weather throughout the year on vapor intrusion.

We compared soil gas concentrations to soil gas SLs to identify potential COCs for the vapor intrusion pathway. For industrial/commercial building exposures, soil gas SLs were derived

based on the most protective air SLs available. We reviewed commercial air SLs from CalEPA and USEPA for cancer and noncancer health effects. We calculated soil gas SLs by dividing the most protective air SL by 0.03, USEPA's screening attenuation factor (USEPA 2015).

For residential exposures, we used the most protective soil gas and air SLs available (ATSDR, USEPA, and CalEPA).

Cancer SLs represent the concentration of a chemical in air that a person would need to be exposed to over a lifetime to have a 1 in 1 million risk (1E-6) for developing cancer from that chemical. Noncancer SLs represent concentrations of substances to which humans might be exposed without experiencing adverse noncancer health effects.

4.4. Screening Results

4.4.1. Worker and Trespasser Exposure to Soil Gas Migrating into Onsite Buildings

The following VOCs were identified as potential COCs for on-site inhalation exposures based on the potential for soil gas to migrate into the indoor air of an onsite building:

- 1,1-dichloroethane
- 1,1-dichloroethene
- 1,2,4-trimethylbenzene
- 1,2-dichloroethane
- 1,2,4-trichlorobenzene
- 1,4-dichlorobenzene
- benzene
- chloroform
- cis-1,2-dichloroethylene (cis-1,2-DCE)
- tetrachloroethylene (PCE)
- trans-1,2-dichloroethylene
- trichloroethylene (TCE)
- vinyl chloride

Table B1 in Appendix B lists the maximum VOC concentrations detected in on-site soil gas samples at a depth of 5 feet that exceeds SLs for vapor intrusion.

The high concentrations of VOCs in soil gas indicate that workers and trespassers inside the former SAIA building could have been exposed to these VOCs from vapor intrusion. Workers were present on site from 1942 to early 2013. In addition, workers were likely exposed to contaminants used during manufacturing processes; however, no indoor air samples are available to evaluate worker exposure. The building was demolished in October 2013.

Potential trespassers to the building before its demolition in 2013 might have been exposed to on-site contaminants from vapor intrusion; however, no indoor air samples are available to

evaluate their exposure. Therefore, ATSDR cannot determine whether VOCs from vapor intrusion could have harmed the health of on-site workers or trespassers in the past.

4.4.2. Upgradient Off-Site Soil Gas and Worker Exposure at ELG Metals

As described above, USEPA collected five soil gas samples at the ELG Metals property. The highest VOC concentrations found above the USEPA commercial screening levels (TCE, PCE, vinyl chloride, and 1,1-dichloroethane) were collected at the deepest depth (35 feet) from the outside soil gas sample nearest to the ELG building. The sample beneath the building also revealed TCE levels above USEPA commercial screening levels at the deepest depth (35 feet) (ITSI Gilbane 2012). These levels also exceeded ATSDR's comparison values used for screening soil gas samples. ATSDR cannot conclude whether VOCs from vapor intrusion could have harmed workers at ELG Metals in the past or present, because no indoor air samples from ELG Metals were collected. Based on the elevated soil gas VOC concentrations found near and beneath the building, there is potential for vapor intrusion into the building. ATSDR recommends that USEPA conduct indoor air sampling at ELG Metals.

4.4.3. Downgradient Off-Site Soil Gas and Worker Exposure

ATSDR compared the soil gas sample results collected along Southern Avenue and the alleyway south of the site with commercial soil gas SLs for vapor intrusion. PCE, TCE, and vinyl chloride were identified as potential COCs. USEPA asked permission to sample indoor air inside these businesses but was unable to gain access. Therefore, ATSDR cannot determine whether past or present exposure to VOCs from vapor intrusion could have harmed workers in buildings along Southern Avenue due to lack of indoor air sampling. ATSDR recommends that USEPA conduct indoor air sampling at businesses south of SAIA along Southern Avenue.

4.4.4. Downgradient Off-Site Soil Gas and Residential Exposure

ATSDR compared shallow soil gas concentrations measured in the alleyway, along McCallum Avenue, and along Duncan Way with residential soil gas SLs for vapor intrusion. VOCs identified as potential COCs included benzene, PCE, TCE, and cis-1,2-DCE. The elevated concentrations of these VOCs found in off-site soil gas suggest that residents in this area could be exposed to VOCs from vapor intrusion into indoor residential air. USEPA gained permission to sample indoor air from eight residences south of SAIA. We do not know if the indoor sample results from these residences are representative of nearby homes in the neighborhood that were not sampled.

4.4.5. Residential Indoor Air

In general, air concentrations were similar for indoor air samples collected in April 2015 and January 2016. Among the VOCs detected, TCE, PCE, and benzene were found in the indoor air samples and in soil gas samples collected near the homes. Benzene and PCE were also found in the outdoor air samples at concentrations similar to some of the concentrations found in the indoor air samples. These three VOCs are commonly found in indoor and outdoor air (ATSDR 2024a). Many industries use these chemicals and some consumer products contain them, which could contribute to their presence in indoor air (USEPA 2011b, ATSDR 2019). Finding similar outdoor benzene and PCE air concentrations suggests that these VOCs could also be from outdoor sources, such as motor vehicles (gasoline) or from nearby industries. However, further

investigation is needed to determine if the indoor VOCs migrated from soil gas beneath the residences or from these other potential sources.

We compared the maximum concentration of each contaminant in the indoor air of each residence with ATSDR's SL called a comparison value (CV). The following chemicals were not selected for further evaluation because their indoor air concentration was below ATSDR's recommended air CV: PCE, TCE, ethylbenzene, m,p-xylene, o-xylene, and toluene (see Appendix B, Table B2.) Exposure to the small amounts of these VOCs found in indoor air is not expected to be a concern for cancer or noncancer health effects.

We identified two contaminants as potential COCs from indoor air samples because indoor levels exceeded ATSDR's recommended CV: 1,2-DCA and benzene. Benzene was detected above ATSDR's CREG (0.13 $\mu g/m^3$) in all eight residences during both sampling periods and requires further evaluation to determine whether exposures could increase cancer risks. The indoor air concentration of benzene, however, did not exceed ATSDR's chronic noncancer CV nor did it exceed ATSDR's chronic minimal risk level for noncancer effects of 6.4 $\mu g/m^3$. Therefore, the risk of noncancer health effects from benzene exposure is not expected to be a concern.

The contaminant 1,2-DCA was not found in soil gas and therefore is not considered a site-related contaminant. However, 1,2-DCA is commonly found in indoor air and was detected above ATSDR's CREG (0.038 $\mu g/m^3$) in all eight residences (USEPA 2011b) (see Appendix B, Table B2). Exceeding the CREG means that further evaluation is needed to determine whether exposures could increase cancer risks. The highest concentration of 1,2-DCA detected in indoor air (0.43 $\mu g/m^3$) is below ATSDR's MRL for noncancer effects of 400 $\mu g/m^3$. Therefore, noncancer health effects are not likely from indoor levels of 1,2-DCA.

Because benzene and 1,2-DCA concentrations in indoor air exceeded ATSDR's CREG for cancer risk, we will evaluate further the risk of cancer from these two chemicals.

4.5. Cancer Evaluation for Residents South of SAIA

Cancer is the name given to a collection of diseases with multiple causes. Carcinogens are any substance that can cause cancer. The National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program states that the lifetime risk for men and women of being diagnosed with cancer is about 40 cases for every 100 people, or 40% (NCI 2026). This corresponds to about 400,000 cases in 1 million people over a lifetime. This is referred to as the "background cancer risk." The term "excess cancer risk" represents the risk above and beyond the background cancer risk.

The cancer risks calculated in this report are the increased risks for developing cancer over the lifetime background cancer risk that exists in the U.S. population.

4.5.1. Exposure Assumptions for Residents Breathing Indoor Air

For residents, we assumed an exposure duration of 24 hours a day, 350 days per year, from birth until 21 years of age for children. For adults, we assumed 33 years of exposure because this is

the 95th percentile residential occupancy period that someone lives at the same address (ATSDR 2022, USEPA 2011c). Appendix C presents the cancer risk formula and exposure assumptions.

4.5.2. Approach to Cancer Health Comparison Evaluation

We used the highest concentration of 1,2-DCA and benzene detected at each residence to estimate the cancer risk for each chemical at each residence (see Table 5). The estimated cancer risk in adults is about twice that of children because adults were assumed to be exposed for 33 years and children were assumed to be exposed for 21 years. The estimated cancer risk from benzene exposure ranged from 1 to 9E-6 or 1 to 9 extra cases of cancer for 1 million people exposed. The estimated cancer risk from 1,2-DCA exposure ranged from 0.3 to 5E-6 or less than 1 to 5 extra cases of cancer for every 1 million people exposed. Both cancer risks are low and are not a health concern.

The individual cancer risk estimates for each residence allowed us to combine the cancer risk from 1,2-DCA and benzene for each residence. The total cancer risk by residence was slightly higher for adults compared to children. The combined risk for adults ranged from 1 in a million (residence #7) to 1 in 100,000 (residence #3) (see Table 6). The cancer risk from the combined exposure to 1,2-DCA and benzene detected in indoor air is still low and not a health concern for cancer.

Table 5. Chemical-specific cancer risk estimates for exposure to VOCs in indoor air.

Residence	Contaminant of Concern	Maximum Concentration in Indoor Air (µg/m^3)	Cancer Risk Using Maximum Concentration
1	1,2-Dichloroethane*	0.19	Adult 2E-6 Child 1E-6
1	Benzene	1.2	Adult 4E-6 Child 2E-6
2	1,2-Dichloroethane*	0.043	Adult 5E-7 Child 3E-7
2	Benzene	0.55	Adult 2E-6 Child 1E-6
3	1,2-Dichloroethane*	0.1	Adult 1E-6 Child 7E-7
3	Benzene	2.7J	Adult 9E-6 Child 6E-6
4	1,2-Dichloroethane*	0.068	Adult 8E-7 Child 5E-7
4	Benzene	1.3	Adult 4E-6 Child 3E-6
5	1,2-Dichloroethane*	0.43J	Adult 5E-6 Child 3E-6
5	Benzene	0.88	Adult 3E-6 Child 2E-6

Residence	Contaminant of Concern	Maximum Concentration in Indoor Air (µg/m^3)	Cancer Risk Using Maximum Concentration
6	1,2-Dichloroethane*	0.16	Adult 2E-6 Child 1E-6
6	Benzene	1.6	Adult 5E-6 Child 3E-6
7	1,2-Dichloroethane*	0.36	Adult 4E-6 Child 3E-6
7	Benzene	1.7	Adult 6E-6 Child 4E-6
8	1,2-Dichloroethane*	0.077	Adult 8E-7 Child 5E-7
8	Benzene	1.5	Adult 5E-6 Child 3E-6

Abbreviation: µg/m^3 = microgram per cubic meter.
*Found in indoor air, but not site-related.

Table 6. Total cancer risk estimates from exposure to 1,2-DCA and benzene in indoor residential air.

Residence	Child Total Cancer Risk from Indoor	Adult Total Cancer Risk from Indoor
1	4E-6	6E-6
2	1E-6	2E-6
3	6E-6	1E-5
4	3E-6	5E-6
5	5E-6	8E-6
6	5E-6	7E-6
7	6E-6	1E-5
8	4E-6	6E-6

4.5.2.1. 1,2-DCA

The contaminant 1,2-DCA is not associated with releases from SAIA and thus is not a site-related compound. This VOC was not found in any soil gas samples in the residential area, or in any other soil gas samples on site or off site. However, we included 1,2-DCA in the evaluation because its concentrations in all residences during one of the two indoor air sampling events exceeded the air SL. Common sources of 1,2-DCA indoors include consumer products made of plastic and vinyl, PVC pipes, furniture, wall coverings, housewares, and automotive products (ATSDR 2024b). Indoor air concentrations of 1,2-DCA ranged from 0.043 µg/m^3 to 0.43 µg/m^3. All detected concentrations exceeded the ATSDR CREG of 0.038 µg/m^3 but did not exceed ATSDR's noncancer screening level (400 µg/m^3.)

The highest estimated cancer risk for children and adults from exposure to 1,2-DCA is 5 extra cases for every 1 million people exposed. This risk is not a health concern.

4.5.2.2. Benzene

Benzene was found in one soil gas sample at a depth of 5 feet in the residential area. Outdoor air samples from the residential area had similar concentrations of benzene as indoor air samples. Given the similar concentrations of benzene in outdoor air as indoor air, it is difficult to know if the benzene detected indoors is from vapor intrusion or from other sources. We included benzene in the evaluation because it is a site-related potential COC, and its concentrations in all eight residences during both sampling events exceeded the air SL.

Benzene concentrations detected in indoor air (0.55 µg/m^3 to 2.7 µg/m^3) were within the 50th percentile ranges in outdoor air sampling that USEPA conducted in fourteen North American household studies (<0.05–4.7 µg/m^3) (USEPA 2011b). Without more data to confirm, it is difficult to determine if the indoor benzene found in residential homes is from vapor intrusion or from other sources. All detected concentrations exceed ATSDR's CREG of 0.13 µg/m^3.

The highest estimated cancer risk for children and adults from exposure to benzene is 9 extra cases for every 1 million people exposed. This estimated cancer risk is not a health concern.

4.6. Limitations of Evaluation

ATSDR cannot determine if an individual will develop health effects based on this evaluation of potential noncancer and cancer health risks. The estimated exposures from the toxicological evaluation are based on mathematical models that rely on information such as types of contaminants and concentrations, the characteristics of the population (children, residents, or workers), and human and animal studies. Our evaluation of the risk of cancer and noncancer effects enable us to assess the level of concern related to estimated exposure, based on the concentration and toxicity of a substance. The results are used to make recommendations for reducing exposures and protecting public health.

ATSDR relied on information and data provided by USEPA. We assume that quality assurance and quality control measures were adequately followed with regard to chain of custody, laboratory procedures, and data reporting. The validity of the analysis and conclusions reported in this report depends on the completeness and reliability of the data provided.

No indoor air or soil gas data are available to evaluate exposures that might have occurred before 2013 at SAIA, ELG Metals, and businesses along Southern Avenue. No indoor air data are available for several buildings where soil gas samples suggest the current potential for vapor intrusion (i.e., ELG Metals and businesses along Southern Avenue). In addition, indoor air was sampled in only a small number of buildings.

Limited residential indoor air data were available for this evaluation (i.e., eight homes were sampled twice). It is difficult to select a VOC concentration that represents long-term exposures, and we do not have enough data to calculate a statistical average exposure concentration, such as a 95% upper confidence level of the mean. Therefore, we used the higher of the two indoor sample concentrations. Indoor air concentrations in a home could change from day-to-day and

could change seasonally. The lifestyle of residents (ventilation, smoking, use of heating and air conditioning, personal care products, cleaning products) and building materials also influence indoor air quality. Finally, the limitations of Radiello samplers are discussed in Appendix D.

5. The Community's Environmental Health Concerns

An important part of the PHA process is the collection, documentation, and response to the community's health and exposure concerns. The community health concerns received during the course of site work are discussed below.

Community members' site-related concerns centered on the groundwater plume and how it could affect the community. Given the location of a nearby high school downgradient of the migrating groundwater plume, they had concerns that the plume could reach the school and affect indoor air quality at the school. In addition, community members were concerned about the safety of water for drinking and growing fruits and vegetables. Some community members reported using only bottled or filtered water. The risk for cancer from contaminated groundwater was a high concern. Another concern was the effect of the Superfund site on property values.

Below are questions from community members and responses to their concerns.

5.1. Is the Water Safe for Drinking and Growing Fruits and Vegetables?

Yes, the South Gate Water Division regularly tests, monitors, and treats drinking water to ensure that the water is safe for drinking and growing fruits and vegetables. See section 4.2 for more information.

5.2. Is There an Increase in Cancers from Groundwater Contamination?

There is no increase in cancers due to groundwater contamination. Cancer is a group of diseases in which abnormal cells divide without control and invade other tissues in the body. Cancer is a broad term that consists of more than 100 types. Age, obesity, diet, hormones (estrogens), viruses, bacteria, parasites, and family genetic history are known factors that increase the risk for cancer development.

Some substances in the environment are also known to be factors that can increase the risk of cancer. These substances are called carcinogens. Some carcinogens are natural in our environment, such as sunlight, cosmic radiation, or radon. Some carcinogens are manufactured, such as some pesticides, tobacco products, or solvents and can be released into the environment. Certain carcinogens can be avoided, such as tobacco smoke or radiation from the sun, but others are difficult to avoid. Fortunately, being exposed to a carcinogen in the environment does not always mean that a person will get cancer. Many factors determine if exposure to a carcinogen will result in cancer, such as the amount of the carcinogen a person was exposed to, the duration of the exposure that occurred, and a person's specific genetic make-up.

To find out if cancer incidence (the rate of new cancer cases over time) in the area near the Superfund site were higher than the cancer incidence in the rest of Los Angeles County, the

California Cancer Registry (CCR) provided information by age about cancer incidence for several cancers from 1972–2014, using Los Angeles County as the standard population. Several types of cancers were selected for the analysis, including cancers of the kidney, liver, bladder, non-Hodgkin lymphoma, myeloma, and leukemia (white blood cells), because they are known to be associated with TCE and heavy metals (heavy metals were detected at the nearby Jervis B. Webb Superfund site). The CCR report is provided in Appendix F. CCR found the following:

During the updated period of 2010 to 2014, age-adjusted incidence rates (AAIRs) of leukemia, bladder cancer, and non-Hodgkin lymphoma decreased while AAIRs of cancers in the kidney, liver and brain increased (Appendix F, Table F1). However, CCR did not observe excess incidences of select cancers beyond the number of expected occurrences in the 2010-2014 period (Appendix F, Tables F2 through F3). With all cancers combined, the number of cancers in the census tracts 536103, 536104, and 536102 were higher than the upper bounds of the 95% confidence interval. Presumably this may be due to an increase in cancers of more common sites, such as breast, skin, and melanoma that are not known to be due to TCE exposure but may be due to changes in other social or demographic factors.

5.3. Do Superfund Sites Affect Property Values?

When a home is near a Superfund site, concerns over contamination can affect property values. These concerns can persist even after a site is cleaned up and deemed safe. This is known as "Superfund stigma," and can affect property values near a hazardous waste site. It is difficult to know how the Superfund sites in South Gate will affect surrounding property values. Education and awareness about a specific Superfund site can help reduce stigma. Real estate professionals and homeowners who want to learn about a specific Superfund site can go to USEPA's website for more information: https://www.epa.gov/superfund/search-superfund-sites-where-you-live.

6. Conclusions

ATSDR reached the following four conclusions:

1. At the time of sampling in 2015 and 2016, vapor intrusion was not considered to be a concern in the eight sampled homes south of SAIA (between Southern Avenue, Duncan Way, Adella Avenue, and Salt Lake Avenue). While some VOCs were detected inside homes their concentrations were low and not likely to harm people's health. Also, the VOCs in indoor air are probably not related to site contamination.

   Benzene and 1,2-dichloroethane (1,2-DCA) were detected in indoor air samples collected in some residences in April 2015 and January 2026. ATSDR estimated cancer risk for residents based on breathing the highest concentration of benzene and 1,2-DCA found inside the eight homes during this time. The highest estimated cancer risk from the combined exposure to benzene and 1,2-DCA was one extra case of cancer for every 100,000 exposed persons. Most estimated cancer risks were in the 1 in a million range.

These estimated cancer risks are very low and are not expected to be a concern for benzene and 1,2-DCA.

All the other chemicals detected in indoor air in these residences were below cancer and noncancer screening levels (See Appendix B, Table B2). Therefore, cancer and noncancer effects are not expected to be a concern for these other chemicals. Among residences not sampled, the risks for cancer and noncancer effects are unknown.

Benzene was found in indoor and outdoor air at similar concentrations. The concentrations were also similar to those typically found in residences across the United States. Benzene was also found in soil gas from outdoor soil samples. Benzene in indoor air could be from several sources:

- outdoor sources such as motor vehicles and nearby industry,
- indoor sources from commercial products (solvents and paint), or
- soil gas beneath buildings via migration known as vapor intrusion.

The VOC 1,2-DCA is not a site-related compound, but it is a common indoor air pollutant. Indoor levels of 1,2-DCA in the eight sampled homes appear to be similar to outdoor levels. Indoor sources include consumer products made of plastic and vinyl, PVC pipes, furniture, upholstery, wall coverings, houseware, and automotive products.

Some uncertainty exists in these conclusions because indoor air concentrations vary over time and might differ from those found in the two sampling events reported in this assessment. Indoor air levels might be higher or lower in summer months compared to the January and April months when sampling was conducted.

2. Several VOCs have the potential to travel from ground to indoor air in some buildings via vapor intrusion. ATSDR cannot determine whether exposure to VOCs from vapor intrusion could have harmed the health of people in the following groups**:**

- Workers and trespassers in the former SAIA building
- Off-site workers in the ELG Metals building north of the SAIA site
- Off-site workers in buildings along Southern Avenue across from SAIA
- Occupants in unsampled residential and commercial buildings between Southern Avenue and Duncan Way who reside over contaminated soil gas and groundwater (referred to as a groundwater plume)

VOCs (cis-1,2-DCE; TCE; PCE; and vinyl chloride) have been found at elevated levels in soil gas beneath these areas. These chemicals could potentially migrate from soil gas beneath the commercial, industrial, and residential buildings and into indoor air of those structures.

Indoor air data were not available to evaluate vapor intrusion for the former on-site building and for businesses near SAIA, nor for residences near SAIA except for the eight

residences that were sampled. Therefore, ATSDR used soil gas data to assess the potential for vapor intrusion into buildings located in the following areas:

- SAIA property
- North of SAIA
- Southern Avenue and the alleyway to the south between Southern Avenue and Duncan Way.

Buildings in these areas are above the groundwater plume. VOCs were detected in soil gas close to the northern boundary of the SAIA property that exceeded soil gas screening levels. VOC concentrations in soil gas measured between Southern Avenue and Duncan Way exceed soil gas screening levels, indicating the potential for vapor intrusion inside residences and businesses in this area. No data were available to evaluate vapor intrusion concerns in businesses north of SAIA (e.g., ELG Metals) and immediately south of SAIA (along Southern Avenue).

3. Drinking water in South Gate is not expected to have harmed the health of people now or in the past because the municipal water is tested, monitored, and treated.

The drinking water for the City of South Gate comes from local groundwater wells that are much deeper than the shallow contaminated groundwater beneath and near the site. The South Gate Water Division regularly tests, monitors, and treats drinking water to ensure that municipal water meets all regulatory requirements before it is distributed to customers. Continued monitoring will prevent future exposures.

4. Exposure to on-site soil did not harm people's health in the past nor is it currently harming people's health because the site is mostly covered with pavement.

Pavement, some concrete slabs, and patches of gravel have covered the SAIA property since it was developed. Currently, a fence barrier is maintained around the site. The ground cover was a barrier to past exposure to on-site soil (i.e., breathing, touching, or swallowing contaminated soil) and along with fencing will prevent current and future exposure. Redevelopment or future construction activities on the property might expose soil gas or contaminated soil and could lead to exposure in the future. The selected future land use (industrial/commercial or residential) will determine the cleanup goals for soil to support safe use. Continued maintenance of the surface coverage at the site will prevent future exposures.

7. Recommendations

ATSDR recommend the following actions:

1. Residents review the information on vapor intrusion included in this health consultation. Residents can learn about steps they can take to improve indoor air quality, such as increasing ventilation when outdoor air quality is good: A Citizen's Guide to Vapor Intrusion. Local air conditions are reported at www.AirNow.gov. More information about vapor

intrusion and indoor air quality is available online from ATSDR at Investigation Vapor Intrusion and PHA Curriculum VI.

Residents who might have been exposed in the past, and who have health or exposure concerns related to contamination from the site, can contact their physician and give them a copy of this health consultation.

2. USEPA offer indoor air sampling for VOCs at the ELG Metals building located immediately north of SAIA, for businesses along Southern Avenue, and for businesses and residences from Southern Avenue south to Duncan Way.

   Workers and residents review the information on vapor intrusion included in this public health assessment.

   Employers, workers, and residents in these areas learn about steps they can take to improve indoor air quality, such as increasing ventilation with outdoor air when the air quality is good.

   Workers in the former SAIA site building, ELG Metals building, or businesses along Southern Avenue across from SAIA who might have been exposed in the past, and who have health or exposure concerns related to the contamination from SAIA, can contact their physician and give them a copy of this health consultation.

3. The South Gate Water Division continues to regularly test, monitor, and treat municipal drinking water to remove contaminants, as required, and provide the community with annual water quality reports.

4. USEPA develops and implements controls for safe future use of the SAIA site land and maintain the integrity of the site security fence. Also, that future owners or users of the site contact and work with USEPA before any redevelopment or construction activities to prevent exposing workers or residents to contaminated soil gas or soil. Any future construction activities exposing contaminated soil be done with USEPA oversight and with safety measures in place to prevent exposure to workers and nearby residents.

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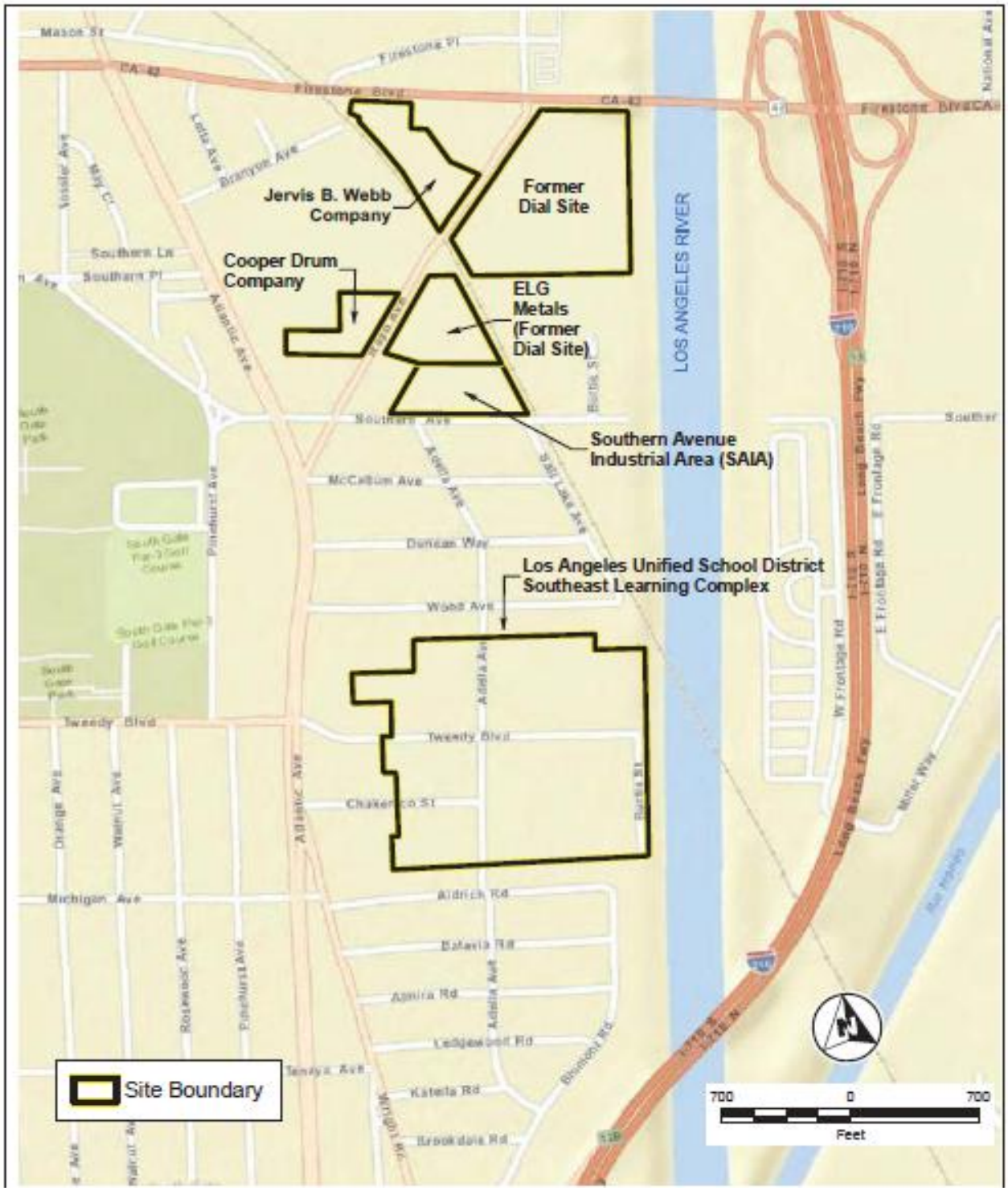
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9. Appendices

9.1. Appendix A: Figures

Figure A1. SAIA site location and other nearby waste sites



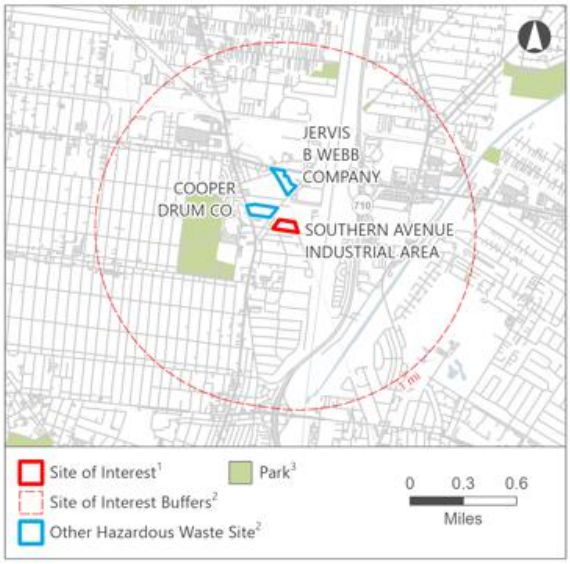
Source: USEPA 2023

Figure A2. SAIA demographics

Southern Avenue Industrial Area
South Gate, Los Angeles County, CA

INTRODUCTORY MAP SERIES
GENERAL SITE PROFILE
EPA FACILITY ID CAN000905902

Site Vicinity Map

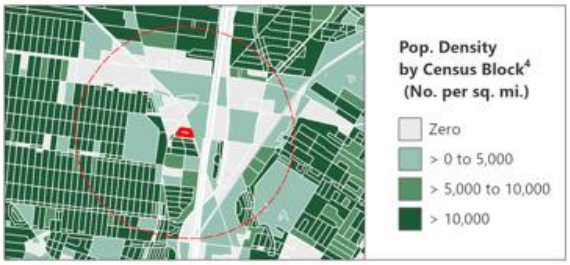


The **General Site Profile Map** depicts the hazardous waste site of interest, along with any airport, industrial, military, or park land uses. It also provides community demographic and housing statistics.

Demographic Statistics[4,5]
Within 1 Miles buffer of site boundary

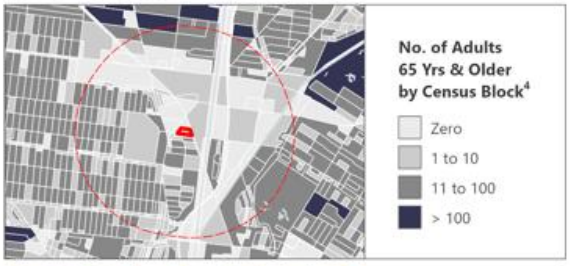
Measure	2010	2020	Change
Total Population	27,431	26,884	-1%
White Alone	14,592	4,454	-69%
Black Alone	426	476	+11%
Am. Indian/Alaska Native Alone	263	1,327	+404%
Asian Alone	352	340	-3%
Native Hawaiian & Other Pacific Islander Alone	22	25	+13%
Some Other Race Alone	10,858	14,106	+29%
Two or More Races	918	6,155	+570%
Hispanic or Latino[6]	25,135	24,827	-1%
Children Aged 6 and Younger	3,120	2,145	-31%
Adults Aged 65 and Older	2,129	3,257	+52%
Females Aged 15 to 44	6,384	5,949	-6%
Housing Units	7,192	7,371	+2%
Housing Units Pre 1950	2,928	3,260	+11%

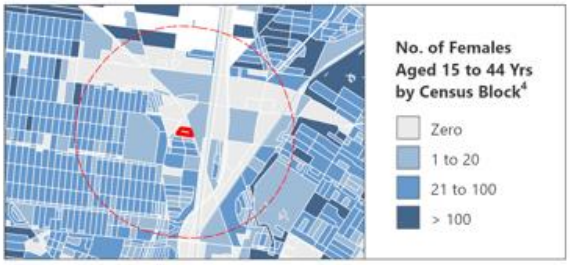
General Population Density



Sensitive Populations







Data Sources: [1]ATSDR GRASP Hazardous Waste Site Boundary Database, [2]ATSDR GRASP, [3]TomTom 2021Q3, [4]US Census 2020 Demographic and Housing Characteristics, **Notes:** [5]Calculated using area-proportion spatial analysis method, [6]Individuals identifying origin as Hispanic or Latino may be of any race. **Coordinate System:** Coordinate System used for all map panels is NAD 1983 StatePlane California V FIPS 0405 Feet

ATSDR Agency for Toxic Substances and Disease Registry

GRASP Geospatial Research, Analysis, and Services Program

PRJ ID 16888

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7/17/2026

Figure A3. SAIA site exposure pathways

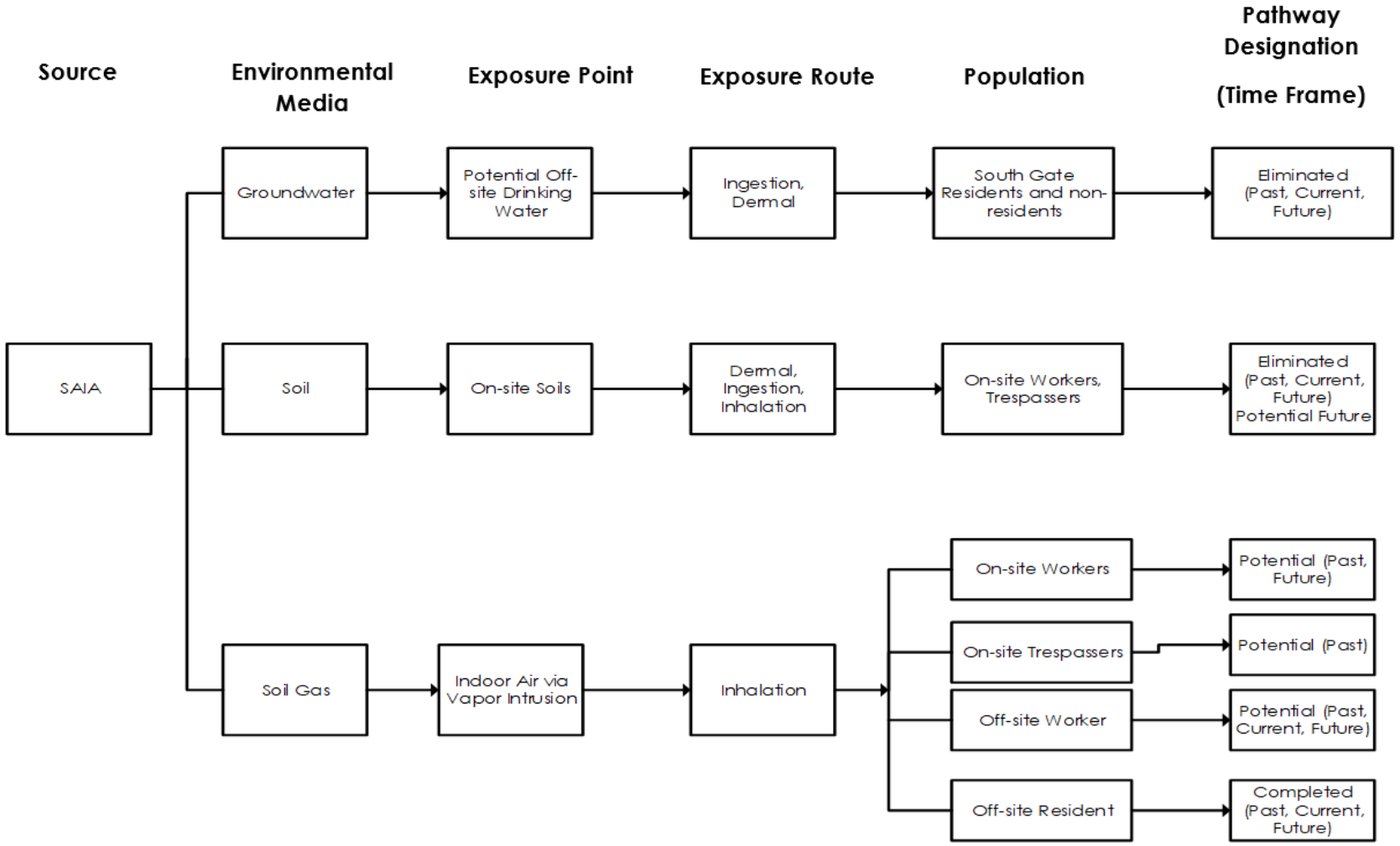
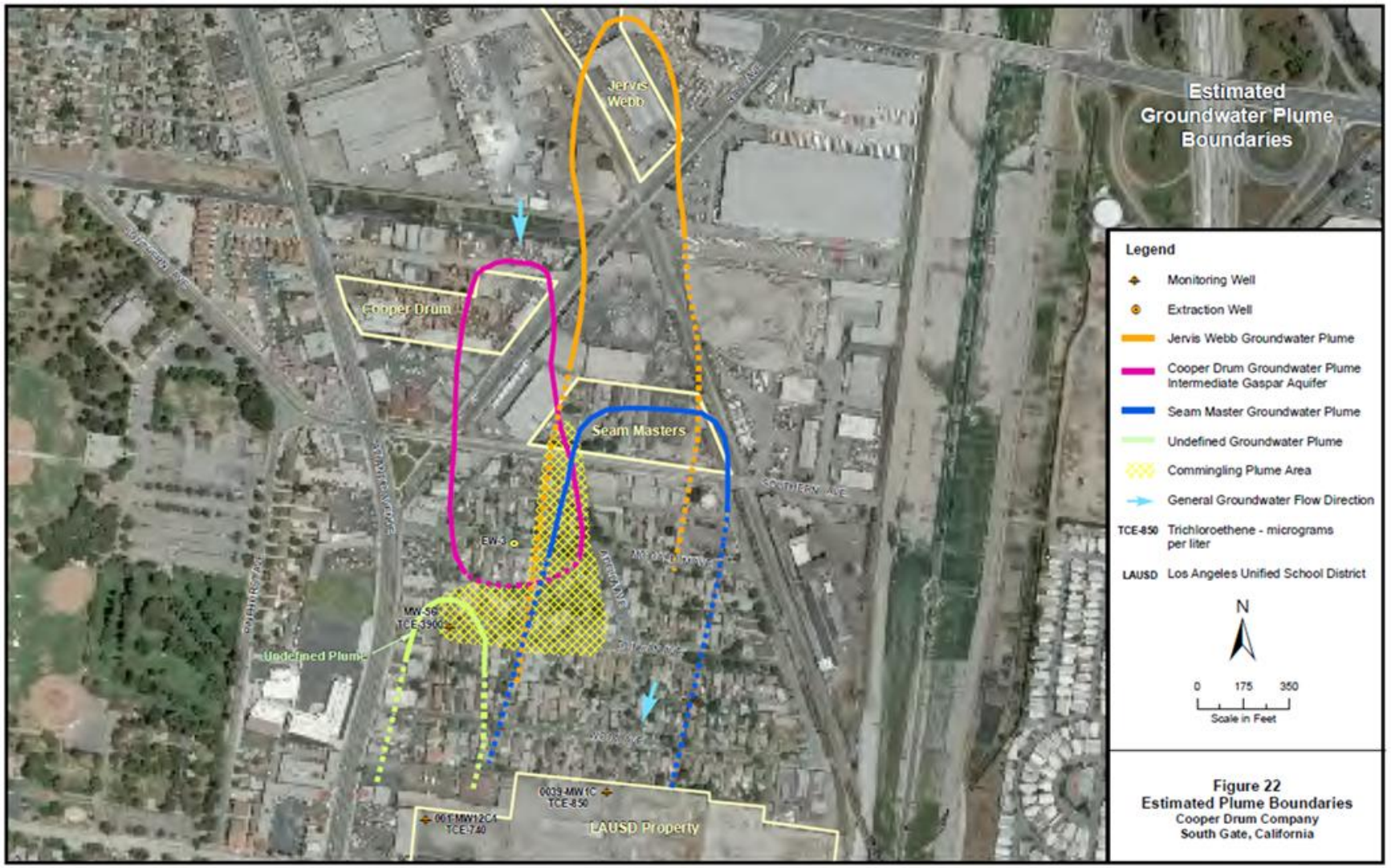
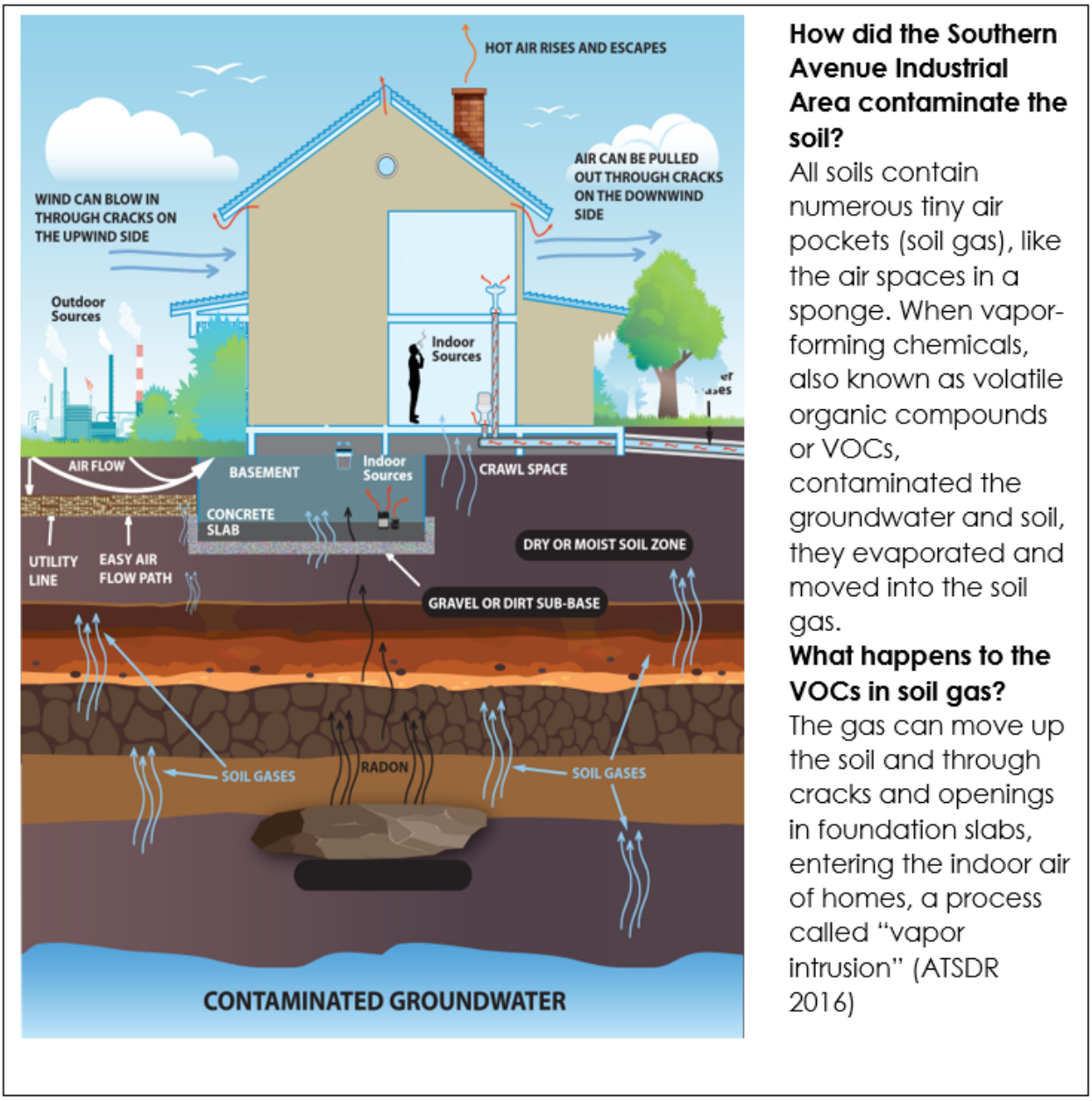


Figure A4. Groundwater plume boundaries near the SAIA site (formerly Seam Masters)



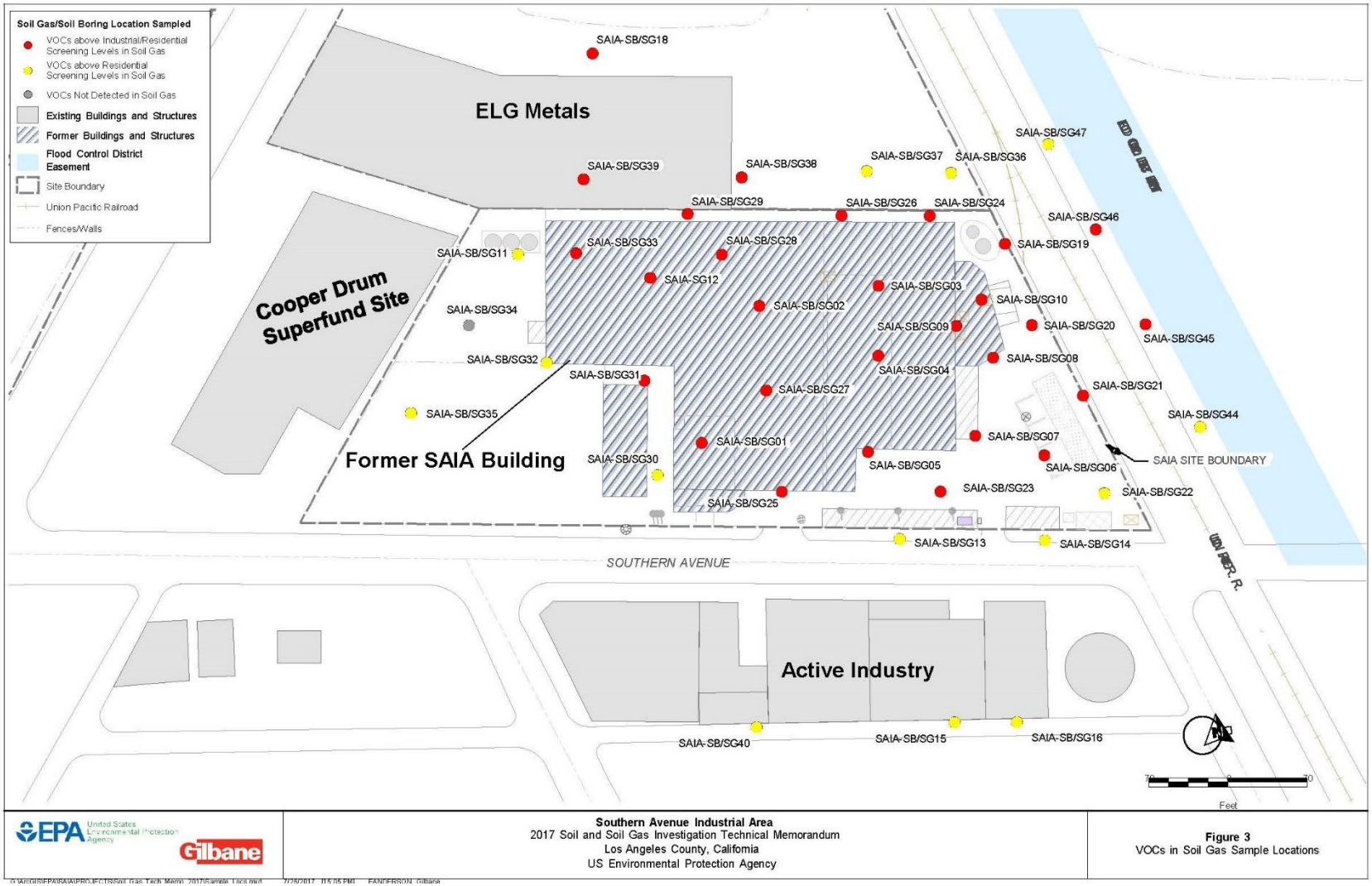
Source: ITSI Gilbane, Cooper Drum Company Superfund Site Remedial Design Technical Memorandum [16]

Figure A5. Pictogram showing the vapor intrusion pathway



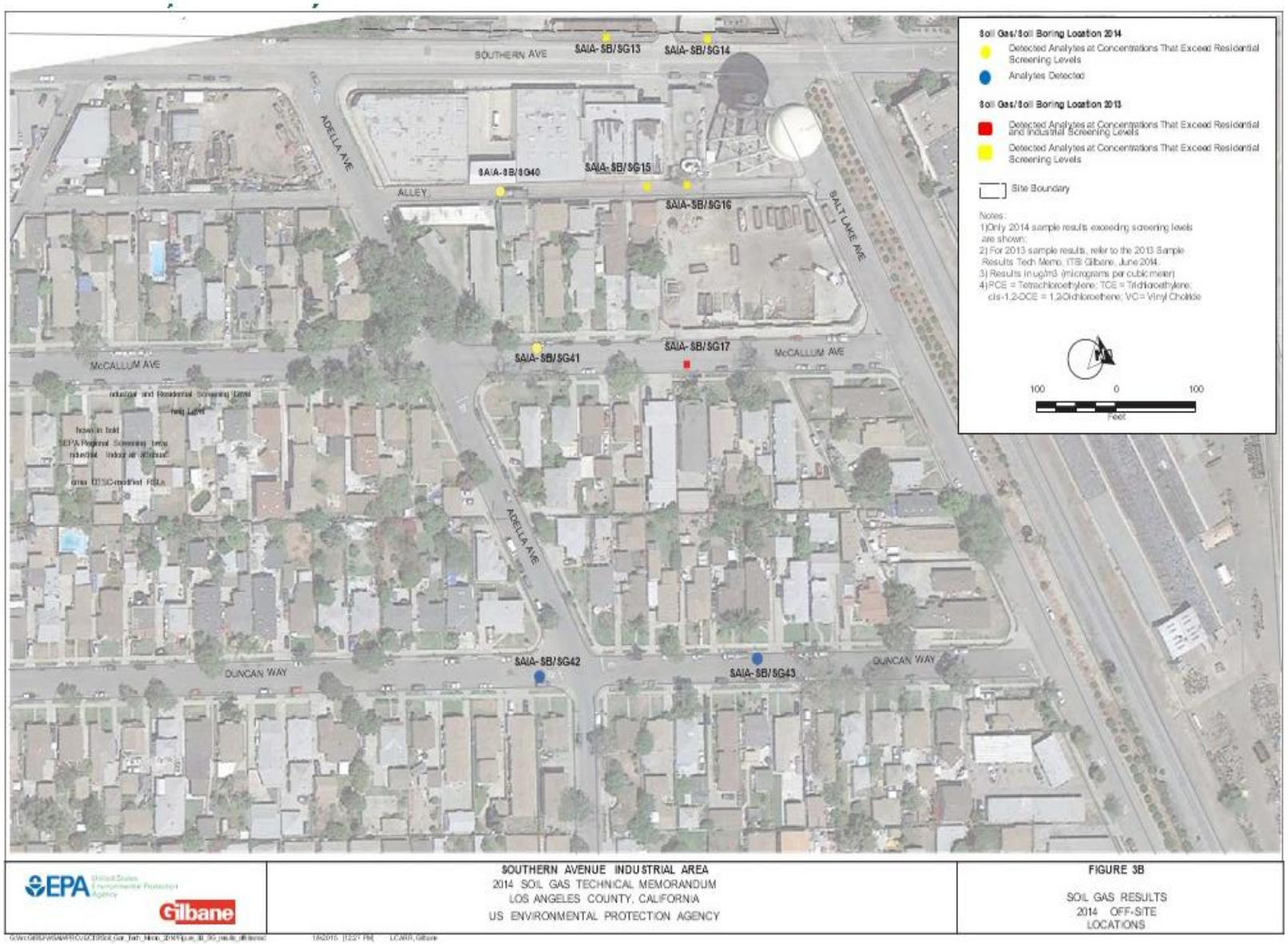
Source: ATSDR 2016

Figure A6. Soil gas samples collected on site and off site at adjacent industrial properties



Source: ITSI Gilbane 2017

Figure A7. Soil gas samples collected south of the SAIA site



Source: ITSI Gilbane 2015

9.2. Appendix B: Tables

Table B1. Maximum VOC concentrations in shallow on-site soil gas above DTSC commercial screening levels and ATSDR CVs.

Contaminant of Concern	Maximum Concentration Detected at 5 Feet Depth* ($\mu g/m^3$)	Commercial Soil Gas SL** ($\mu g/m^3$)	ATSDR Recommended Soil Gas CV ($\mu g/m^3$)
1,1-Dichloroethane	430,000	257 DTSC SL-C	NV
1,1-Dichloroethene	16,000	10,333 DTSC SL-NC	130 EMEG
1,2,4-Trimethylbenzene	23,000	8,667 RSL-NC	2,000 RMEG
1,2-Dichloroethane	72	16 RSL-C	1.2 CREG
1,2,4-Trichlorobenzene	72	57 DTSC SL-C	NV
1,4-Dichlorobenzene	770	37 RSL-C	2,000 EMEG
Benzene	340	14 DTSC SL-C	4.3 CREG
Chloroform	85	18 RSL-C	1.4 CREG
cis-1,2-Dichloroethylene	4,400,000	1,167 DTSC SL-NC	NV
trans-1,2-Dichloroethylene	52,000	6,000 RSL-NC	NV
Tetrachloroethylene (PCE)	53,000	2.7 DTSC-SL-C	130 CREG
Trichloroethylene (TCE)	5,800,000	100 RSL-C	7 CREG
Vinyl chloride	520,000	5 DTSC SL-C	3.7 CREG

Abbreviations: $\mu g/m^3$ = micrograms per cubic meter; CV = Comparison value, DTSC = California Department of Toxic Substances Control; SL = screening level; C = cancer; NC = noncancer; RSL = EPA regional screening level; EMEG = environmental media evaluation guide; RMEG = reference dose media evaluation guide; CREG = cancer risk evaluation guide; NV = no value
*Depth below ground surface.
**Based on USEPA RSL Composite Worker Ambient Air or DTSC industrial indoor air screening levels. Calculated using default soil to gas to indoor air attenuation factor of 0.03
Data Source (USEPA 2011, 2018)

Table B2. Range of VOC concentrations found in residential indoor, crawl space, and outdoor air samples collected in 2015 and 2016.

VOCs found in Residences n = 8	Crawl Space April 2015 n = 3 (µg/m^3)	Indoor Air April 2015 n = 8 (µg/m^3)	Outdoor Air April 2015 n = 2 (µg/m^3)	Crawl Space January 2016 n = 3 (µg/m^3)	Indoor Air January 2016 n = 8 (µg/m^3)	Outdoor Air January 2016 n = 2 (µg/m^3)	ATSDR Recommended Comparison Values (µg/m^3)	ATSDR Minimal Risk Level* (µg/m^3)
1,2-DCA	*0.05–0.054*	*0.043–0.27*	*0.059*	*<0.13*	*0.07J–0.43J*	*0.07J*	0.038 CREG	400
Benzene	*0.69–0.86*	*0.55–0.88*	*0.4– 0.75*	*0.89J–1.3*	*1.2–2.7J*	*1.6*	0.13 CREG	6.4
PCE	0.089–0.11	0.078–1.4	0.08–0.086	0.14J–0.21	0.18J–1.3	0.23–0.24	3.8 CREG	41
TCE	0.05 to <0.14	0.05–0.07	<0.14–<0.15	<0.15	0.07J–0.09 J	<0.14–<0.15	0.21 CREG	2.1
Ethylbenzene	0.29–0.34	0.21–0.67	0.22–0.3	0.59–0.82	0.67J – 2.4	0.87–1.1	260 EMEG	260
m,p-Xylene	0.96–1.1	0.65–2.2	0.68–0.99	2 J–2.7	2.1J–4.9	2.9–3.7	43 EMEG	43
o-Xylene	0.32–0.37	0.23–0.6	0.25–0.32	0.71J–0.97	0.74J–2.1	1–1.3	43 EMEG	43
Toluene	1.7–2	1.3–3.6	1.3–1.8	2.9J–4.4	3.8–5.9	5–5.3	3,800 EMEG	3,800

Abbreviations: µg/m^3 = micrograms per cubic meter; CREG = cancer risk evaluation guide; EMEG = environmental media evaluation guide for noncancer; J = estimated concentration; n = number of samples.
*ATSDR's minimal risk level (MRL) for a specific chemical is also the noncancer comparison value for the same chemical.
Note: Highlighted cells with italicized numbers indicate concentrations that exceed an ATSDR's comparison value.
Data source (USEPA 2011, 2018)

9.3. Appendix C: Exposure Assumptions and Formula Used to Estimate Cancer Risks

Residential cancer risk calculation from indoor air samples [28, 56]

CR = (Adjusted EPC x IUR) x (ED ÷ LY) for each exposure group Equation 1

Total CR = Sum of the CR for all exposure groups Equation 2

Where,

CR = cancer risk (unitless),
EPC = exposure point concentration (µg/m^3 or ppb),
IUR = inhalation unit risk [(µg/m^3)$^{-1}$ or (ppb)$^{-1}$],
ED = exposure duration (years),
LY = lifetime years (78 years),
ED ÷ LY = EF_{cancer}
EF_{cancer} = exposure factor (cancer) = EF (noncancer) x age-specific exposure duration (years) ÷ 78 years
RME = reasonable maximum exposure

$$\text{RME } EF_{\text{cancer, adult residential chronic}} = \frac{24\frac{hr}{d} x\ 7\frac{d}{wk} x\ 52.14\frac{wk}{yr} x\ 33\ yr}{24\frac{hr}{d} x\ 7\frac{d}{wk} x\ 52.14\frac{wk}{yr} x\ 78\ yr} = 0.42 \quad \text{Equation 3}$$

$$\text{RME } EF_{\text{cancer, child residential chronic}} = \frac{24\frac{hr}{d} x\ 7\frac{d}{wk} x\ 52.14\frac{wk}{yr} x\ 21\ yr}{24\frac{hr}{d} x\ 7\frac{d}{wk} x\ 52.14\frac{wk}{yr} x\ 78\ yr} = 0.27 \quad \text{Equation 4}$$

Cancer Risk $_{adult}$ = Adjusted EPC x IUR x EF_{adult} Equation 5

Cancer Risk $_{child}$ = Adjusted EPC x IUR x EF_{child} Equation 6

Table C1. Cancer risk calculations for contaminants of concern

Contaminant of Concern	Exposure Factor	IUR* (µg/m^3)$^{-1}$	Adjusted EPC (µg/m^3)	Cancer Risk$^+$
Benzene	Adult = 0.42 Child = 0.27	7.8-E6*	2.7	Adult = 9-E6 Child = 6-E6
1,2-DCA	Adult = 0.42 Child = 0.27	2.6E-5*	0.43	Adult = 5-E6 Child = 3E-6
PCE	Adult = 0.42 Child = 0.27	2.6-E7*	1.4	Adult = 2-E7 Child = 1-E7

Abbreviations: EPC = exposure point concentration; EF = exposure frequency; DCA = dichloroethane; PCE = tetrachloroethylene; µg/m3 = micrograms per cubic liter
* U.S. Environmental Protection Agency inhalation unit risk (IUR)

+The cancer risk for adults assumes exposure for 33 years. The cancer risk for children assumes exposure for 21 years (birth to age 21 years.)

9.4. Appendix D: Evaluation of Radiello Air Samplers

What Are Radiello Passive/Diffusive Air Samplers?

Passive samplers such as Radiellos work by allowing chemicals in ambient air to pass through a sorbent at a steady uptake rate. The sorbents are chosen according to the chemicals of interest, such as volatile organic compounds (VOCs). Sampling duration for Radiellos can be from 15 minutes to 30 days, and uptake occurs over that time. The samplers are analyzed by extracting the chemicals of interest from the sorbent and measuring the total mass of each chemical trapped during the sampling period.

Advantages

Radiellos have specific advantages over SUMMA canisters or evacuated canisters, which are commonly used indoor air sampling methods. A major limitation of SUMMA is that more than one sampler is required to evaluate indoor air concentrations for longer than 24 hours. The ability to sample over long durations is one of the greatest advantages of using passive samplers, such as Radiellos, versus the more traditional method of SUMMA canisters (Dawson 2015). Passive samplers such as Radiellos can be deployed over longer durations (up to 30 days), reflecting a greater range of indoor air conditions than a single 24-hour period. Analyzing one passive sampler over a longer period rather than multiple SUMMA canisters enables laboratories to run only one sample, which saves time and money. Another major advantage with passive samplers over SUMMA canisters is that they are much less intrusive and simpler to use and collect. Ease of use and minimal intrusiveness also lead to lower overall costs and are helpful when seeking permission from residents to sample indoor air from their homes.

Passive samplers such as Radiellos are routinely used in occupational settings by industrial hygienists to evaluate exposure and health. A number of National Institute for Occupational Safety and Health (NIOSH) methods use passive samplers to evaluate exposure and health. Despite its limitations, passive sampling has been adopted for risk assessments in occupational settings because of the advantages mentioned previously.

To evaluate the validity of passive samplers, the U.S. Environmental Protection Agency (USEPA) conducted a study to test active and passive sampling in subsurface and indoor air samples over 2 years at a test duplex site (Schumacher 2012). They found that for chlorinated compounds passive samplers showed good agreement to USEAP TO-15 methods that use SUMMA canisters at both sites. USEPA also found excellent agreement between averages for passive samplers exposed for 7 days and those exposed for 14 days, suggesting uniform uptake rates for both periods.

A separate independent study looked at samples in triplicate, at three different laboratories, under various temperature, humidity, and flow conditions and concentrations (Dawson 2015). The authors found that the accuracy for most measured VOCs is within a factor of two of active sampling methods. However, they did show a slight bias during 1-to-7 day tests. The study found

that the results of passive samplers, including Radiellos, would meet similar data quality objectives as conventional active samples via SUMMA canister for TO-15 or active thermal desorption (ATD) tube TO-17 analysis.

Limitations

A major limitation in using Radiello samplers to investigate vapor intrusion is that the activated charcoal–based sorbent for VOCs used in the Radiello RAD130 cartridge adsorbent does not detect vinyl chloride, a breakdown or daughter product of tetrachloroethylene (PCE). Vinyl chloride was detected in soil gas beneath Southern Avenue Industrial Area (SAIA) and along Southern Avenue. It was identified as a contaminant of concern for workers in businesses along Southern Avenue, across from SAIA, but not for the residential area based on soil gas data. USEPA indicated they will use SUMMA canisters when collecting indoor air samples in the businesses along Southern Avenue in the future. To determine if a data gap on vinyl chloride remains from indoor air sampling using Radiellos, USEPA specified the following method in the SAIA Sampling and Analysis Plan:

"*If the detected concentration of cis-1,2-dichloroethylene in indoor air is greater than TCE, resampling will be conducted using a SUMMA canister, because the dechlorination process will be assumed to have occurred and the quantitation of vinyl chloride in indoor air should be confirmed more accurately*."

The variability in temperature and humidity over the sampling time can be a limitation when using passive samplers. This is because the uptake rate used to help calculate the average concentration over the sampling period is dependent on temperature and humidity. Indoor temperature and humidity can vary depending on time of day and season, use of a heating, ventilation, and air conditioning (HVAC) system, and amount of ventilation. However, for the indoor air sampling at these residences, USEPA recorded air temperature and barometric pressure at just two time points: when the samplers were deployed and when they were collected. ATSDR generally recommends confirmation sampling using an inter-duplicate method when passive samplers are used at a site. Passive samplers tend to have good reproducibility for a calibrated batch under similar conditions, so larger sampling events could use one capillary-flow controlled canister confirmation sample per batch of passive samples, e.g., one confirmation sample for each10 passive samples.

Considering the advantages and limitations, ATSDR used the data provided by USEPA to evaluate human health risks from breathing indoor air at residences south of SAIA.

9.5. Appendix E: Brief Summary of ATSDR's PHA Process

ATSDR follows the PHA process to find out:

Whether people living near a hazardous waste site are being exposed to toxic substances.
Whether that exposure is harmful.
What must be done to stop or reduce exposure.

The PHA process is a step-by-step consistent approach during which ATSDR:

- Establishes communication mechanisms, including engaging communities at the beginning of site activities and involves them throughout the process to respond to their health concerns.
- Collects many different kinds of site information.
- Obtains, compiles, and evaluates the usability and quality of environmental and biological sampling data (and sometimes modeling data) to examine environmental contamination at a site.
- Conducts four main, sequential scientific evaluations.
    - Exposure pathways evaluation to identify past, present, and future site-specific exposure situations, and categorize them as completed, potential, or eliminated.
    - Screening analysis to compare the available sampling data to media-specific environmental screening levels (ATSDR comparison values [CVs] and non-ATSDR screening levels). This identifies potential contaminants of concern that require further evaluation for completed and potential exposure pathways.
    - Exposure Point Concentrations (EPCs) and exposure calculations for contaminants flagged as requiring further evaluation in completed and potential exposure pathways. It involves calculating EPCs, using the estimated EPCs to perform exposure calculations, and determining which site-specific scenarios requires an in-depth toxicological effects analysis.
    - In-depth toxicological effects evaluation, if necessary, based on the three previous scientific evaluations. This step looks more closely at contaminant-specific information in the context of site exposures. This evaluation can also help determine if there is a potential for non-cancer or cancer health effects.
- Summarizes findings and next steps, while acknowledging uncertainties and limitations.
- Provides recommendations to site-related entities, partner agencies, and communities toprevent and minimize harmful exposures.

The sequence of steps can differ based on site-specific factors. For instance, health assessors might define an exposure unit before or after the screening analysis.

For more detail on the PHA process, please visit Explanation of ATSDR's PHA Process Evaluation. Readers can also refer to ATSDR's Public Health Assessment Guidance Manual for all information related to the step-wise PHA process.

9.6. Appendix F: South Gate Cancer Report 2017

Keck School of Medicine of USC

USC Cancer Surveillance Program

September 30, 2017

Danny Kwon
Environmental Health Assessor California Department of Public Health
510-620-3670 (office) Danny.kwon@cdph.ca.gov

Dear Mr. Kwon,

You requested an updated assessment of cancer occurrences in two Superfund sites in South Gate, Los Angeles County. In 2012, an initial assessment was conducted for census tracts 536101 and 536102 (Census 2000) brought on by concerns regarding groundwater contamination with trichloroethylene (TCE). The initial report in 2012 included an assessment of seven cancer sites; kidney cancer, leukemia, bladder cancer, liver cancer, non-Hodgkin lymphoma, multiple myeloma and brain cancer from 1972 to 2009.

For the current updated report, we investigated occurrences of the same seven cancers by period, or year of diagnosis including additional years of 2010 to 2014 and by census tracts. The corresponding census tracts of the interested Superfund sites underwent changes in the census tract boundaries since 1990. In order to accommodate for this change while keeping the geographic location of the interested area consistent, we used census tract 536100 for 1990 census covering 1972 through 1999, census tracts 536101 and 536102 for 2000 census covering 2000-2009, and census tracts 536103, 536104 and 536102 for 2010 census covering 2010-2014. Los Angeles County population was used as the standard population to calculate age-adjusted incidence rates (AAIR), and to estimate periodic change in AAIRs from 1996-2009 to 2010-2014. We used cancer site- and period-specific AAIR of Los Angeles County for and applied to the population of the census tracts to calculate the number of cases we would expect to find if the cancers occurred at the same rate as those in Los Angeles County. This expected number is expressed as an expected range with 95% confidence. All analytic results are transferred from the initial report for ease of comparison and listed in Tables G1, G2, G3, G5, G6, G8, and G9. Any updated analytic results are noted in red, highlighted in yellow and listed in Tables G1, G4, G7, and G10. For protection of identities of the cancer patients, any cells with fewer than 5 individuals are noted as "<5." Similarly, tables 4.1 and 4.2 from the initial report listing annual count of each cancer incidence is no longer provided due to the small cell size. During the updated

period of 2010 to 2014, AAIRs of leukemia, bladder cancer and non-Hodgkin lymphoma decreased while AAIRs of cancers in the kidney, liver and brain increased (Table 1). However, we did not observe excess incidences of select cancers beyond the number of expected occurrences in 2010-2014 period (Tables 2 through 3). When all cancers combined, the number of cancers in the census tracts 536103, 536104 and 536102 were higher than the upper bounds of the 95% confidence interval. Presumably this may be due to an increase in cancers of more common sites, such as breast, skin, melanoma that are not known to be due to TCE exposure but may be due to changes in other social or demographic factors.

This information is provided on behalf of the Los Angeles County Cancer Surveillance Program and the California Cancer Registry. Please contact us for further information if needed.

Sincerely,



Amie Hwang, PhD, MPH
Assistant Professor to Clinical Preventive Medicine USC
Cancer Surveillance Program

CC: Thomas Mack, Professor, Department of Preventive Medicine and Pathology.
Wendy Cozen, DO, MPH, Professor, Department of Preventive Medicine and Pathology.
Dennis Deapen, DrPH, Director, USC Cancer Surveillance Program.
Sandy Kwong, MPH, Research Scientist Supervisor, California Department of Public Health.
Cyllene Morris, PhD, Research Program Director, California Cancer Reporting and Epidemiologic Surveillance Program.

Table F1. Age-adjusted incidence rates (AAIR) of select cancers in census tracts and of Los Angeles County, 1972 to 2009, and updated 2010 to 2014.

Cancer Sites	Census Tracts AAIR 1972–1995	Census Tracts AAIR 1996–2009	Census Tracts % Change 1972–1975 to 1996–2009	Census Tracts Update for AAIR 2010–2014	Census Tracts Update for % Change 1996–2009 to 2010–2014	Los Angeles County AAIR 1972–1995	Los Angeles County AAIR 1996–2009	Los Angeles County % Change 1972–1975 to 1996–2009	Los Angeles County Update for AAIR 2010–2014	Los Angeles County Update for % Change 1996–2009 to 2010–2014
Kidney	8.1	15.9	95.5	20.3	27.7%	8.1	12.6	54.2	11.6	-7.9%
Leukemia	9.4	10.6	12.7	5.3	-50.0%	11.6	12.6	8.3	10.4	-17.5%
Bladder	24.1	24.4	1.3	12.1	-50.4%	19.2	18.8	-2.1	13.9	-26.1%
Liver	1.9	8.6	364.9	12.5	45.3%	3.6	8	120.6	7.8	-2.5%
Non-Hodgkin's Lymphoma	12.9	18	39.4	11.3	-37.2%	14.1	19.4	37.7	15.7	-19.1%
Multiple Myeloma	2.4	4.3	75.7	2.1	-51.2%	4.8	5.9	23.3	5.1	-13.6%
Brain	4	3.6	-11	11.4	216.7%	5.7	5.9	2.4	4.8	-18.6%
All Cancers	476.7	429.7	-9.9	465.2	8.3%	463.4	504.5	8.9	377.8	-25.1%

Table F2. Age-adjusted Incidence rates (AAIR) of select cancers in Census Tract 536100 and in Los Angeles County from 1972 to 1995.

Cancer Sites	AAIR Census Tract	AAIR Los Angeles County	Number of Cases in Census Tract	Expected Range[1]	P-Value
Kidney	8.14	8.14	19	8-26	0.53
Leukemia	9.38	11.63	19	13-34	0.42
Bladder	24.13	19.24	47	24-50	0.09
Liver	1.85	3.64	<5*	1-14	0.28
Non-Hodgkin's Lymphoma	12.91	14.12	28	17-40	0.97
Multiple Myeloma	2.43	4.81	5	2-26	0.2
Brain	3.99	5.73	9	5-21	0.39
All	476.7	463.4	968	877-999	0.32

[1] Expected range is 95% confidence interval of expected number of cases in census tract.

*To protect the identity of cancer patients, any cells with fewer than 5 are noted as <5.

Table F3. Age-adjusted incidence rates (AAIR) of select cancers in Census Tracts 536101 and 536102, and in Los Angeles County from 1996 to 2009.

Cancer Sites	AAIR Census Tract	AAIR Los Angeles County	Number of Cases in Census Tract	Expected Range[1]	P-Value
Kidney	15.91	12.55	20	7-25	0.3
Leukemia	10.57	12.59	14	9-27	0.42
Bladder	24.44	18.84	31	13-34	0.09
Liver	8.6	8.03	11	3-18	0.73
Non-Hodgkin's Lymphoma	18	19.44	23	15-37	0.65
Multiple Myeloma	4.27	5.93	6	1-14	0.73
Brain	3.55	5.87	6	2-16	0.44
All	429.7	504.5	551	606-708	0

[1] Expected range is 95% confidence interval of expected number of cases in census tracts.

Table F4. Age-adjusted incidence rates (AAIR) of select cancers in Census Tracts 536103, 536104, and 536102, and in Los Angeles County from 2010 to 2014 (update).

Cancer Sites	AAIR Census Tract	AAIR Los Angeles County	Number of Cases in Census Tract	Expected Range[1]	P-Value
Kidney	20.33	11.64	9	1-12	0.22
Leukemia	5.29	10.42	<5*	1-11	0.35
Bladder	12.05	13.86	6	1-12	0.91
Liver	12.55	7.82	8	0-9	0.05
Non-Hodgkin's Lymphoma	11.30	15.74	5	2-15	0.33
Multiple Myeloma	2.13	5.09	<5	0-6	0.48
Brain	11.39	4.81	7	1-7	0.01
All	465.15	377.79	247	176-233	<0.001

[1] Expected range is 95% confidence interval of expected number of cases in census tracts

*To protect the identity of cancer patients, any cells with fewer than 5 cases are noted as <5.

Table F5. Age-adjusted incidence rates (AAIR) of select cancers in Census Tracts 536101, and in Los Angeles County from 1996 to 2002.

Cancer Sites	AAIR Census Tract	AAIR Los Angeles County	Number of Cases in Census Tract	Expected Range[1]	P-Value
Kidney	16.96	10.66	7	0–9	0.12
Leukemia	4.71	12.03	<5*	0–11	0.37
Bladder	23.95	17.94	9	0–12	0.22
Liver	3.01	6.77	<5	0–7	0.48
Non-Hodgkin's Lymphoma	12.74	18.42	5	1–14	0.42
Multiple Myeloma	4.16	5.57	<5	0–6	0.76
Brain	3.85	5.39	<5	0–7	0.67
All	437.7	482.4	171	165–221	0.12

[1] Expected range is 95% confidence interval of expected number of cases in census tract

*To protect the identity of cancer patients, any cells with fewer than 5 cases are noted as <5.

Table F6. Age-adjusted incidence rates (AAIR) of select cancers in Census Tracts 536101, and in Los Angeles County from 2003 to 2009.

Cancer Sites	AAIR Census Tract	AAIR Los Angeles County	Number of Cases in Census Tract	Expected Range[1]	P-Value
Kidney	11.1	14.43	<5*	0–12	0.59
Leukemia	14.16	13.15	5	0–12	0.8
Bladder	16.55	19.73	6	1–13	0.85
Liver	14.67	9.28	6	0–8	0.15
Non-Hodgkin's Lymphoma	21.68	20.45	9	2–15	0.7
Multiple Myeloma	5.73	6.3	<5	0–6	0.93
Brain	5.23	6.35	<5	0–8	0.67
All	417.3	526.6	15	183–243	0.0002*

[1] Expected range is 95% confidence interval of expected number of cases in census tract.

*To protect the identity of cancer patients, any cells with fewer than 5 cases are noted as <5.

Table F7. Age-adjusted incidence rates (AAIR) of select cancers in Census Tracts 536101 (53103, 53104), and in Los Angeles County from 2010 to 2014 (update).

Cancer Sites	AAIR Census Tract	AAIR Los Angeles County	Number of Cases in Census Tract	Expected Range[1]	P-Value
Kidney	23.80	11.64	7	0-9	0.11
Leukemia	6.82	10.42	<5*	0-8	0.49
Bladder	6.58	13.86	<5	0-9	0.42
Liver	8.63	7.82	<5	0-7	0.31
Non-Hodgkin's Lymphoma	11.05	15.74	<5	0-10	0.41
Multiple Myeloma	—	5.09	—	—	—
Brain	16.13	4.81	7	0-5	0.00
All	409.07	377.79	141	110-157	0.49

[1] Expected range is 95% confidence interval of expected number of cases in census tract.

*To protect the identity of cancer patients, any cells with fewer than 5 cases are noted as <5.

Table F8. Age-adjusted incidence rates (AAIR) of select cancers in Census Tract 536102, and in Los Angeles County from 1996 to 2002.

Cancer Sites	AAIR Census Tract	AAIR Los Angeles County	Number of Cases in Census Tract	Expected Range[1]	P-Value
Kidney	11.84	10.66	<5	0–7	0.60
Leukemia	9.97	12.03	<5	0–7	0.75
Bladder	49.62	17.94	12	0–10	0.003
Liver	3.36	6.77	<5	0–5	0.89
Non-Hodgkin's Lymphoma	19.23	18.42	5	0–10	0.65
Multiple Myeloma	6.85	5.57	<5	0–5	0.37
Brain	5.58	5.39	<5	0–4	0.83
All	442.4	482.4	111	98–143	0.43

[1] Expected range is 95% confidence interval of expected number of cases in census tract

*To protect the identity of cancer patients, any cells with fewer than 5 cases are noted as <5.

Table F9. Age-adjusted incidence rates (AAIR) of select cancers in Census Tracts 536102, and in Los Angeles County from 2003 to 2009.

Cancer Sites	AAIR Census Tract	AAIR Los Angeles County	Number of Cases in Census Tract	Expected Range[1]	P-Value
Kidney	24.17	14.43	6	0–8	0.13
Leukemia	8.67	13.15	<5*	0–8	0.87
Bladder	15.56	19.73	<5	0–11	0.77
Liver	11.05	9.28	<5	0–6	0.44
Non-Hodgkin's Lymphoma	16.35	20.45	<5	0–11	0.79
Multiple Myeloma	0	6.30	0	0–5	—
Brain	0	6.35	0	0–5	—
All	449.9	526.6	111	108–155	0.086

[1] Expected range is 95% confidence interval of expected number of cases in census tract.

*To protect the identity of cancer patients, any cells with fewer than 5 cases are noted as <5.

Table F10. Age-adjusted incidence rates (AAIR) of select cancers in Census Tracts 536102, and in Los Angeles County from 2010 to 2014 (update).

Cancer Sites	AAIR Census Tract	AAIR Los Angeles County	Number of Cases in Census Tract	Expected Range[1]	P-Value
Kidney	13.27	11.64	<5*	0–6	0.85
Leukemia	4.33	10.42	<5	0–5	0.79
Bladder	22.31	13.86	<5	0–6	0.25
Liver	17.56	7.82	<5	0–4	0.02
Non-Hodgkin's Lymphoma	10.83	15.74	<5	0–7	0.80
Multiple Myeloma	4.80	5.09	<5	0–3	0.59
Brain	—	4.81	—	—	—
All	552.26	377.79	106	54–88	0.00

[1] Expected range is 95% confidence interval of expected number of cases in census tract.

*To protect the identity of cancer patients, any cells with fewer than 5 cases are noted as <5.