HAZARD RANKING SYSTEM (HRS) DOCUMENTATION RECORD COVER SHEET

Name of Site: Carlisle Village Cleaners

EPA ID No.: NMN000622185

Contact Persons

Site Investigation: Michelle Delgado-Brown, NPL Coordinator, EPA Region 6 214-665-3154

Documentation Record: Michelle Delgado-Brown, NPL Coordinator, EPA Region 6 214-665-3154

Pathways, Components or Threats Not Scored

1. **Soil Exposure and Subsurface Intrusion Pathway**: The soil exposure component has not been scored because it is not expected to significantly contribute to the site score and would not affect the decision to list the site on the NPL.
2. **Ground Water Migration Pathway**: The ground water migration pathway has not been scored because it is not expected to significantly contribute to the site score and would not affect the decision to list the site on the NPL.
3. **Air Migration Pathway**: The air migration pathway has not been scored because it is not expected to significantly contribute to the site score and would not affect the decision to list the site on the NPL.
4. **Surface Water Migration Pathway**: The surface water migration pathway has not been scored because it is not expected to significantly contribute to the site score and would not affect the decision to list the site on the NPL.

HRS DOCUMENTATION RECORD

Name of Site	Carlisle Village Cleaners	Date Prepared: September 2024
EPA Region	6	
Street Address of Site*:	3611 Simms Avenue SE	
City, County, State, ZIP Code:	Albuquerque, Bernalillo County, New Mexico, 87108	
General Location in the State:	The former Carlisle Village Cleaners (which is at the center of the Site) is located at 3611 Simms Avenue SE in Albuquerque, Bernalillo County, New Mexico, to the southeast of downtown Albuquerque within Central New Mexico (See HRS documentation record Figure 1 for Location Map and Ref. 3, p. 1).	
Topographic Map:	The following U.S. Geological Survey (USGS) 7.5-minute series topographic map was used in locating the facility: Albuquerque East Quadrangle, New Mexico (1990) (Ref. 3, p. 1).	
Latitude:	35° 3' 49.8" North	
Longitude:	106° 36 ' 14.07 " West	
Ref:	Latitude and longitude coordinates were measured from the center of the former facility at 3611 Simms Avenue SE and were determined using a scaled topographic map and Geographic Information System (GIS) software (Ref. 3, p. 1; Ref. 64, p. 1).	

*The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, disposed, or placed, or has otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

<u>Scores</u>

Air Pathway	Not Scored
Ground Water[1] Pathway	Not Scored
Soil Exposure and Subsurface Intrusion Pathway	100
Surface Water Pathway	Not Scored
HRS SITE SCORE	**50.00**

[1] "Ground water" and "groundwater" are synonymous; the spelling is different due to "ground water" being codified as part of the HRS, while "groundwater" is the modern spelling.

WORKSHEET FOR COMPUTING HRS SITE SCORE

		S	S^2
1.	Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)	NS	NS
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	NS	NS
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	NS	NS
2c.	Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	NS	NS
3a.	Soil Exposure Component Score (S_{se}) (from Table 5-1, line 22)	NS	NS
3b.	Subsurface Intrusion Component Score (S_{ssi}) (from Table 5-11, line 12)	100	10,000
3c.	Soil Exposure and Subsurface Intrusion Pathway Score (S_{sessi}) (from Table 5-11, line 13)	100	10,000
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	NS	NS
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_{sessi}^2 + S_a^2$	100	10,000
HRS Site Score Divide the value on line 5 by 4 and take the square root		50.00	

HRS TABLE 5-11 SUBSURFACE INTRUSION COMPONENT SCORESHEET

Factor Categories and Factors	Maximum Value	Value Assigned
Subsurface Intrusion Component		
Likelihood of Exposure:		
1. Observed Exposure	550	**550**
2. Potential for Exposure		
2a. Structure Containment	10	**NS**
2b. Depth to contamination	10	**NS**
2c. Vertical Migration	15	**NS**
2d. Vapor Migration Potential	25	**NS**
3. Potential for Exposure (lines 2a * (2b+2c+2d), subject to a maximum of 500)	500	**NS**
4. Likelihood of Exposure (higher of lines 1 or 3)	550	**550**
Waste Characteristics:		
5. Toxicity/Degradation	(a)	**100**
6. Hazardous Waste Quantity	(a)	**10,000**
7. Waste Characteristics (subject to a maximum of 100)	100	**32**
Targets:		
8. Exposed Individual	50	**50**
9. Population:		
9a. Level I Concentrations	(b)	**429.996**
9b. Level II Concentrations	(b)	**170.8898**
9c. Population within an Area of Subsurface Contamination	(b)	**NS**
9d. Total Population (lines 9a + 9b + 9c)	(b)	**600.8858**
10. Resources	5	**5**
11. Targets (lines 8 + 9d + 10)	(b)	**655.8858**
Subsurface Intrusion Component Score		
12. Subsurface Intrusion Component (lines 4 x 7 x 11)/82,500[c] (subject to a maximum of 100)	100	**100**
Soil Exposure and Subsurface Intrusion Pathway Score		
13. Soil Exposure Component + Subsurface Intrusion Component (subject to a maximum of 100)	100	**100**

[c] Do not round to the nearest integer.
NS – Not Scored

NOTES TO THE READER

The following rules were applied when citing references in this documentation record:

1. Tracking numbers are assigned by the region to every page of every reference. The tracking number consists of the reference number followed by the page number within that reference. A tracking number has a two-digit number followed by the sequential number which represents the page number of the document (e.g., Reference 4, Page 1 is expressed as 04.0001 in Reference 4). These page numbers are used in parenthetical reference citations throughout this HRS documentation record.
2. Hazardous substances are often listed by the names used in the Superfund Chemical Data Matrix (SCDM) (Ref. 2).
3. Attachment A of this documentation record consists of the following figures:
    a. Figure 1 – Site Location Map
    b. Figure 2 – Area of Observed Exposure (AOE) Location Map
    c. Figure 3 – Extent of Subsurface Contamination Map

REFERENCES

Ref.
No. Description of the Reference

1. U.S. Environmental Protection Agency (EPA). Hazard Ranking System, Title 40 Code of Federal Regulations (CFR) Part 300, Appendix A (55 Federal Register [FR] 51583, Dec. 14, 1990, as amended at 82 FR 2779, Jan. 9, 2017; 83 FR 38037, Aug. 3, 2018), as published in the Code of Federal Regulations on July 1, 2019, with two attachments. Attachment A: Federal Register Vol. 55, No. 241. December 14, 1990. Hazard Ranking System Preamble. Attachment B: Federal Register Vol. 82, No. 5, January 9, 2017. Addition of a Subsurface Intrusion Component to the Hazard Ranking System Preamble. Available at https://semspub.epa.gov/src/document/HQ/100002489. 197 pages.

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SITE SUMMARY

Site Description

The Carlisle Village Cleaners site (Site) is comprised of an area of regularly occupied structures (ROS) with documented indoor air contamination overlying soil contaminated by historical releases of tetrachloroethene (PCE) from two former dry cleaners, including Carlisle Village Cleaners and L&M Laundry and Cleaners, that operated from the South Carlisle Shopping Village strip mall. The area of observed exposure (AOE) covers an estimated area of 18 acres of a predominately residential neighborhood with some light commercial activity (Ref. 59). The AOE includes 16 single-family residential structures, 70 multi-family residential subunits, 16 commercial subunits, and two religious institutions; for HRS scoring purposes this involves approximately 190 residents and 85 workers. There are three unoccupied commercial structures (given ROS numbers 398, 711, and 802 for tracking purposes) and five multi-family residential subunits located above the ground floor (subunits of ROS 118, 202, and 808) which were not included in HRS calculations (for HRS purposes, only regularly occupied structures are eligible for scoring; in multi-story, multi-subunit, regularly occupied structures, only subunits on a level with observed exposure samples and levels below are considered to be within an AOE; also, for multi-subunit structures inferred to be in an AOE, only regularly occupied subunits on the lowest level of the structure are counted as part of the AOE. [Ref. 1, Section 5.2.0]). Additionally, although subsurface soil vapor contamination is discussed in this HRS documentation record, an area of subsurface contamination is not scored for HRS purposes. (See Table 1 and Figure 2 of this HRS documentation record.)

As shown by Site investigation history below and discussed in the Attribution section of this HRS documentation record, the origin of contamination at the Site is a release, or releases, from past operations at Carlisle Village Cleaners and L&M Laundry and Cleaners located at 3611 and 3607 Simms Avenue SE in Albuquerque, Bernalillo County, New Mexico (Figure 1 of this HRS documentation record, Ref. 3, p. 1). An area of contaminated soil vapor was discovered during the field investigation portion of an Abbreviated Preliminary Assessment performed by the New Mexico Environment Department (NMED) in May 2022. Further investigations at the Site identified contaminated soil vapor originating at the facilities (Ref. 33, pp. 19-21; Ref. 35, pp. 6-7, 10-11; Ref. 39, pp. 15, 20-21). The contamination extends for approximately 600 feet radially from the facilities (Ref. 39, p. 21; Ref. 46, pp. 3-4; Figure 2 of this HRS documentation record). The total mass of contaminated soil vapor is not known.

The contaminants of concern (COCs) at the Site and found within soil vapor contamination are PCE and its daughter product, trichloroethene (TCE) (Ref. 35, pp. 8-9, 11). Historical dry-cleaning operations are often the source of environmental releases of chlorinated solvents due to the absence of pollution prevention controls on historical dry-cleaning machines or improper storage and waste disposal practices at historical facilities (Ref. 26, p. 2; Ref. 27, pp. 8, 20-21). PCE is scored for HRS purposes in this HRS documentation record; TCE is not scored because it is not expected to significantly contribute to the site score.

During the November/December 2023 subsurface characterization field event (NMED), Site geology to 105 feet below ground surface was characterized during the drilling and installation of two soil vapor monitor wells (SVMW-01 and SVMW-02). Within the first 105 feet, five hydrostratigraphic units (HSUs) were identified in the two soil borings and categorized as HSU 1 through HSU 5 (Ref. 33, p. 17). HSU 1 begins at the surface and is approximately 15 feet thick (Ref. 33, p. 18). This unit is comprised primarily of silty sand with some calcium carbonate cement and caliche present (Ref. 33, p. 17). HSU 2 is an approximately four- to eight-foot unit containing clay and silt layers (Ref. 33, p. 18). HSU 3 is approximately 60 feet thick and contains layers of fine to coarse sand with increasing gravel presence at the bottom of the unit (Ref. 33, p. 18). HSU 4 is a 2.5- to 9-foot unit dominated by clay and silt that contains beds of gravel and sand (Ref. 33, p. 18). HSU 5 extends from the terminus of HSU 4 to the depth of investigation, and is at least 16 feet thick (Ref. 33, p. 19). HSU 5 is comprised of poorly graded sand (Ref. 33, p. 19). The subsurface characterization field event demonstrated that the inconsistent and thin clay and silt layers identified in HSU 2 and HSU 4 have not impeded the vertical migration of chlorinated solvent vapor contamination. Additionally, while moist conditions were noted in HSU 2 and HSU 4, no evidence of saturation or perched groundwater was encountered during the investigation (Ref. 33, p. 25).

The COCs, PCE and TCE, are volatile compounds which are part of a common class of chemicals with known vapor intrusion characteristics (Ref. 29, p. 44). The subsurface vapors in the vadose zone may travel vertically and eventually enter overlying structures as a component of gas by migrating through cracks, seams, interstices, utility conduits, or other gaps in foundations (Ref. 29, pp. 48-49).

In September 2022, the EPA Removal Program began indoor air monitoring at the five buildings that comprise the strip mall: ROS 705 – Child Counseling Center, ROS 708 – Coffee Warehouse, ROS 799 – Coffee Office Space, ROS 707 – Realtor, and ROS 704 – Art Studio (Ref. 40, p. 3; Ref. 55, pp. 11, 12). Based on the initial indoor air results, the EPA Removal Program installed twelve air purifying units (APUs) across the five buildings in November 2022 as an interim mitigation measure to protect building occupants, and to mitigate and assess COC levels at the strip mall properties (Ref. 40, pp. 7-10; Ref. 55, p. 9).

Site Investigation History

The Carlisle Village Cleaners site was discovered by NMED in 2021 through an effort to inventory all known historical dry-cleaning operations in the State of New Mexico. The historical dry cleaners, identified through a records review of primary sources (e.g. city directories, Sanborn maps), were categorized by operational duration, occupation status of the former facilities, and proximity to a sensitive population (Ref. 35, p. 11; Ref. 36, pp. 2-3). Former operations that appeared likely to pose a threat to human health or the environment based on meeting one or more priority criteria were referred to the NMED Superfund Oversight Section for investigation (Ref. 35, p. 11; Ref. 36, p. 4).

In January 2022, the NMED Superfund Oversight Section completed a Pre-Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Screen of the Site. The Pre-CERCLA Screen recommended a limited investigation to determine if a release of chlorinated solvents had occurred at this location (Ref. 35, pp. 9, 11; Ref. 37, pp. 1, 6).

In May 2022, the NMED Superfund Oversight Section performed the field investigation recommended in the Pre-CERCLA Screen as part of an Abbreviated Preliminary Assessment (Ref. 35, p. 10). Four passive soil gas samples (PSG-01 through PSG-04) were deployed along the north and south property boundaries of the South Carlisle Shopping Village strip mall (Ref. 35, pp. 10, 20). PCE was detected at a maximum concentration of 188,000 $\mu g/m^3$ (PSG-04), while TCE was detected at a maximum concentration of 992 $\mu g/m^3$ (PSG-04) (Ref. 35, pp. 11, 17; Ref. 38, pp. 65, 118). Based on the results of this investigation, NMED recommended immediate response by the EPA Removal Program to mitigate vapor intrusion risk for occupants of the South Carlisle Shopping Village strip mall and further investigation into the extent of soil vapor contamination, the potential for additional vapor intrusion exposure, and potential impact of the release on nearby groundwater receptors through a Site Inspection (Ref. 35, p. 11).

In September 2022, the EPA Removal Program began indoor air monitoring at the five buildings that comprise the strip mall: Child Counseling Center, Coffee Warehouse, Coffee Office Space, Realtor, and Art Studio (Ref. 40, p. 3; Ref. 55, p. 11). Based on the initial indoor air results, the EPA Removal Program installed twelve compact, stand-alone indoor APUs across the five buildings in November 2022 (Ref. 40, pp. 7-10). Additional indoor air monitoring events to evaluate the effectiveness of the APUs occurred in November 2022, January 2023 (sub-slab only), February 2023, April 2023, May 2023, and July 2023 (Ref. 40, pp. 11, 14-20; Ref. 41, pp. 5-6, 8, 12). The maximum PCE concentration detected in indoor air at the strip mall was 3,160 $\mu g/m^3$ (lab sample ID L1622198-03) in May 2023, while the maximum PCE concentration detected in sub-slab soil vapor at the strip mall was 6,990,000 μg/m^3 (lab sample ID L1578917-03) in January 2023 (Ref. 60, pp. 143, 444; Ref. 61, pp. 165, 673; Ref. 62, p. 10; Ref. 63, pp. 4, 10). The EPA Removal Program also collected water and sludge samples from a separator tank connected to two floor drains within the former L&M Laundry and Cleaners (3607 Simms Avenue SE) (Ref. 40, pp. 8-10). The analytical results identified 1.1 μg/L of PCE in water, and no PCE in the underlying sludge (Ref. 42, pp. 3, 5).

To obtain a preliminary idea of the horizontal extent of vapor contamination, and to identify structures at risk of vapor intrusion based on soil vapor contaminant concentrations in public right-of-way, the EPA Removal Program conducted three passive soil gas sampling events in January, May, and June 2023 (Ref. 40, pp. 21-26; Ref. 41, pp. 7-9; Ref. 43, pp. 1,332-1,335; Ref. 44, pp. 733-734; Ref. 45, pp. 1,040-1,042). In total, 122 passive soil gas samplers were installed within a 1,000-foot radius of the Site (Ref. 43, pp. 1,332-1,335; Ref. 44, pp. 733-734; Ref. 45, pp. 1,040-1,042; Ref. 46, p. 4). The maximum detected PCE concentration was 62,800 μg/m^3 (Ref. 44, p. 21). The results indicated that the highest concentrations of PCE in soil vapor were located between the bounds of Carlisle Boulevard SE to the west, Thaxton Avenue SE to the south, Hermosa Dr SE to the east, and the alleyway just north of the strip mall to the north, correlating with a historical release or releases at the South Carlisle Shopping Village strip mall. The results further indicated that the soil vapor contamination has migrated radially in all directions, with detectable PCE concentrations found at the 1,000-foot boundary in most samples (Ref. 46, p. 4).

In October 2023, the NMED Superfund Oversight Section performed a residential structures/sensitive population vapor intrusion sampling event as part of a Site Inspection. NMED collected indoor air and crawl space vapor samples at 18 single family and multi-family residential structures and at one daycare facility. Eighteen of the 19 sampled structures had measurable levels of PCE in crawl space air, and all 19 sampled structures had measurable levels of PCE in indoor air (Ref. 8, pp. 8-36, 2,409-2,412; Ref. 9, pp. 8-31, 1,402-1,404). The maximum PCE concentration found within the living space of a residential structure (ROS-709-42) was 210 μg/m^3, while the maximum PCE concentration found within a residential crawl space (ROS-709-22) was 190 μg/m^3 (Ref. 8, pp. 11, 30; Ref. 39, p. 34).

In November and December of 2023, the EPA Removal Program performed a commercial structures vapor intrusion sampling event. EPA collected indoor air, crawl space, and sub-slab soil vapor samples at 13 structures (ROSs 203, 320A, 398, 704, 705, 707, 708, 799, 801, 803, 806, 901, 927), including the five buildings that comprise the South Carlisle Shopping Village strip mall and two religious institution structures (Ref. 47; Ref. 48). All 13 sampled structures had measurable levels of PCE in indoor air (Ref. 12, pp. 8, 12, 771, 780, 835, 844; Ref. 13, pp. 106, 111, 571, 573, 618, 621; Ref. 14, pp. 7, 11, 422, 434, 471, 483; Ref. 15, pp. 110, 115, 513, 516, 556, 559; Ref. 16, pp. 98, 102, 1648, 1658, 1722, 1733; Ref. 17, pp. 98, 102, 734, 737, 746, 800, 803, 811). The maximum indoor air PCE concentration found within a structure not associated with the strip mall was 1,760 μg/m^3 in ROS 801, while the maximum sub-slab soil gas PCE concentration measured was 593,000 μg/m^3 under ROS 801 (Ref. 13, pp. 571, 618; Ref. 20, pp. 4, 20; Ref. 49, p. 1,073).

In November and December of 2023, NMED, through environmental services contractor INTERA Incorporated (INTERA), performed subsurface characterization activities at the Site (Ref. 33, p. 13). The objectives of the characterization were to determine whether perched groundwater or dense non-aqueous phase liquid was present between ground surface and 100 feet below ground surface; to characterize lithology; to measure contaminant concentrations in soil, soil vapor, and groundwater; and to install nested soil vapor monitor wells (Ref. 33, p. 7). No perched groundwater, DNAPL, or significant fine-grained confining units were identified (Ref. 33, p. 25). Soil samples, which were collected during boring advancement, demonstrated a maximum PCE concentration of 1.3 mg/kg (SVMW-02) at the 80-to-82-foot depth interval (Ref. 33, p. 39). Soil vapor samples were collected from multiple intervals within the two developed soil vapor monitor wells. The maximum PCE concentration detected in a vapor well (SVMW-01) was 7,100,000 μg/m^3 at 83 feet below ground surface (Ref. 33, p. 40).

5.0 SOIL EXPOSURE AND SUBSURFACE INTRUSION PATHWAY

5.2 SUBSURFACE INTRUSION COMPONENT

The origin of chlorinated solvent contamination at the Site is historical dry-cleaning operations at the South Carlisle Shopping Village strip mall. PCE became the most frequently used dry cleaning solvent beginning in the 1940s. Based on the operational history of each of the two dry cleaners and the years in operation (Carlisle Village Cleaners from 1953 to 1975 and L&M Laundry and Cleaners from 1969 to 2017), it is likely that both operations used PCE as the primary dry-cleaning solvent (Ref. 26, pp. 1-2; Ref. 30). Historical dry-cleaning operations are often the source of environmental releases of chlorinated solvents due to the absence of pollution prevention controls on historical dry-cleaning machines or improper storage and waste disposal practices at historical facilities (Ref. 26, p. 2; Ref. 27, pp. 8, 20-21). A release of PCE at the South Carlisle Shopping Village strip mall was confirmed based on soil vapor sampling during the May 2022 Abbreviated Preliminary Assessment field event (NMED) (Ref. 35, pp. 6, 10, 11). The identification of the South Carlisle Shopping Village strip mall as the source of the release of PCE was further supported by the January/May/June 2023 passive soil gas sampling events (EPA) (Figure 3 of this HRS documentation record; Ref. 39, p. 39; Ref. 46, p. 4). TCE, a degradation product of PCE, was also identified in soil vapor and, along with PCE, is a Site contaminant of concern (Ref. 32; Ref. 35, pp. 9, 10, 11, 17; Ref. 46, p. 3).

During the NMED November/December 2023 subsurface characterization field event , Site geology to 105 feet below ground surface was characterized during the drilling and installation of two soil vapor monitor wells (SVMW-01 and SVMW-02). Within the first 105 feet, five hydrostratigraphic units (HSUs) were identified in the two soil borings and categorized as HSU 1 through HSU 5 (Ref. 33, p. 17). HSU 1 begins at the surface and is approximately 15 feet thick (Ref. 33, p. 18). This unit is comprised primarily of silty sand with some calcium carbonate cement and caliche present (Ref. 33, p. 17). HSU 2 is an approximately four- to eight-foot unit containing clay and silt layers (Ref. 33, p. 18). HSU 3 is approximately 60 feet thick and contains layers of fine to coarse sand with increasing gravel presence at the bottom of the unit (Ref. 33, p. 18). HSU 4 is a 2.5- to 9-foot unit dominated by clay and silt that contains beds of gravel and sand (Ref. 33, p. 18). HSU 5 extends from the terminus of HSU 4 to the depth of investigation, and is at least 16 feet thick (Ref. 33, p. 19). HSU 5 is comprised of poorly graded sand (Ref. 33, p. 19). The subsurface characterization field event demonstrated that the inconsistent and thin clay and silt layers identified in HSU 2 and HSU 4 have not impeded the vertical migration of chlorinated solvent vapor contamination. Additionally, while moist conditions were noted in HSU 2 and HSU 4, no evidence of saturation or perched groundwater was encountered during the investigation (Ref. 33, p. 25).

PCE and TCE belong to a class of chemicals with known vapor intrusion characteristics (Ref. 29, p. 44). The subsurface source of vapor-forming chemicals, which has so far been identified as a soil vapor contamination within the vadose zone, has migrated radially in all directions from the strip mall via gaseous diffusion through coarse-grained geologic materials as demonstrated by the January/May/June 2023 passive soil gas sampling events (EPA) (Ref. 29, pp. 41, 46; Ref. 33, pp. 17-19; Ref. 46, pp. 3-4). Additionally, during the November/December 2023 subsurface characterization field event (NMED), active soil vapor samples from two Site soil vapor monitor wells (SVMW-01 and SVMW-02) have demonstrated PCE concentrations in the vadose zone ranging from 230,000 $\mu g/m^3$ to 7,100,000 $\mu g/m^3$ between four feet and 91 feet below ground surface (Ref. 33, p. 40). Hazardous vapors in the vadose zone can enter overlying structures as a component of gas by migrating through cracks, seams, interstices, utility conduits, or other gaps in foundations (Ref. 29, pp. 48-49). The area overlying the known boundaries of the soil vapor contamination consists of a dense array of single family and multi-family residential neighborhoods with some light commercial activity in the near Site vicinity. Residential structures in this area are constructed with an underlying crawlspace without a radon or vapor mitigation system, and commercial structures are constructed with a slab-on-grade foundation (Ref. 31; Ref. 46, p. 4; Ref. 65). Based on tax assessor records, the residential structures surrounding the Site were primarily built between 1946 and 1951 with underlying crawlspaces (Ref. 4, pp. 1-3).

5.2.0 GENERAL CONSIDERATIONS

There is one identified area of observed exposure (AOE), or area containing structures with indoor air contamination due to subsurface intrusion, at the Site as shown in Figure 2 of this HRS documentation record. There is also documented subsurface contamination underlying the AOE (Ref. 46, pp. 3-4). However, an area of subsurface contamination (ASC) was not evaluated in this HRS documentation record because it is not expected to significantly contribute to the overall Site score.

AOE Number	Type of Structure	Numbers of Specific Type of Structure	References
AOE 1	Single-Family Residential Multi-Family Residential Commercial Religious Institutions	16 70[1,2] 16[1] 2	Figure 2 of this HRS documentation record

[1] The number of regularly occupied subunits is included in place of the number of regularly occupied structures for multi-family residential and commercial structures.
[2] For scoring purposes, only ground-floor units (units on the lowest level of the structure) are included in AOE 1 and given an ROS number.

Area of Observed Exposure (AOE)

AOE 1 – Area of Observed Exposure 1

<u>Location, description,</u> and <u>delineation</u> of AOE (see Figure 2 of this HRS documentation record):

There are 16 regularly occupied single-family residential structures, 70 regularly occupied multi-family residential ground-floor subunits, 16 regularly occupied commercial structures, and two regularly occupied religious institutions within the area of AOE 1. There are three unoccupied commercial structures (given ROS numbers 398, 711, and 802 for tracking purposes), and five multi-family residential subunits located above the ground floor (subunits of ROS 118, 202, and 808), which were not included in HRS calculations (for HRS purposes, only regularly occupied structures are eligible for scoring; in multi-story, multi-subunit, regularly occupied structures, only subunits on a level with observed exposure samples and levels below are considered to be within an AOE; also, for multi-subunit structures inferred to be in an AOE, only regularly occupied subunits on the lowest level of the structure are counted as part of the AOE. [Ref. 1, Section 5.2.0]). Although ROS 398 was not scored because it was vacant, it exhibited PCE concentrations that would meet observed exposure criteria and exceeded the cancer risk screening concentration benchmark. The boundaries of AOE 1 were determined by establishing observed exposure to PCE through indoor air sampling at 33 regularly occupied structures or subunits (see observed exposure information in Tables 5 and 6 below of this HRS documentation record). An additional 71 regularly occupied structures or subunits have inferred contamination based on their location between structures with observed contamination (see inferred structures identified in Table 20 below of this HRS documentation record) (Ref. 4, p. 1-3; Figure 2 and Table 1 of this HRS documentation record). All structures are located within a 600-foot radius of the location of the former dry cleaners (Ref. 39, p. 21; Ref. 46, pp. 3-4; Figure 2 of this HRS documentation record). In Table 1, each structure is identified by a number, and scored subunits associated with a structure are identified by a letter appended to the ROS number.

TABLE 1 – REGULARLY OCCUPIED STRUCTURES WITHIN AOE 1

Type of Structure	ROS ID	References
Single-Family Residential	ROS 221	Ref. 4, pp. 1-3, 23
Single-Family Residential	ROS 222	Ref. 4, pp. 1-3, 25
Single-Family Residential	ROS 602	Ref. 4, pp. 1-3, 63
Single-Family Residential	ROS 620	Ref. 4, pp. 1-3, 65
Single-Family Residential	ROS 709	Ref. 4, pp. 1-3, 79
Single-Family Residential	ROS 712	Ref. 4, pp. 1-3, 83
Single-Family Residential	ROS 713	Ref. 4, pp. 1-3, 85
Single-Family Residential	ROS 810	Ref. 4, pp. 1-3, 105
Single-Family Residential	ROS 812	Ref. 4, pp. 1-3, 109
Single-Family Residential	ROS 902	Ref. 4, pp. 1-3, 113
Single-Family Residential	ROS 903	Ref. 4, pp. 1-3, 115
Single-Family Residential	ROS 904	Ref. 4, pp. 1-3, 117
Single-Family Residential	ROS 905	Ref. 4, pp. 1-3, 119
Single-Family Residential	ROS 908	Ref. 4, pp. 1-3, 123
Single-Family Residential	ROS 909	Ref. 4, pp. 1-3, 125
Single-Family Residential	ROS 914	Ref. 4, pp. 1-3, 129
Multi-Family Residential[1] (multi-subunit)	ROS 118 A	Ref. 4, pp. 1-3, 5; Ref. 58, p. 2
	ROS 118 B	Ref. 4, pp. 1-3, 5; Ref. 58, p. 2
Multi-Family Residential (multi-subunit)	ROS 201 A	Ref. 4, pp. 1-3, 7
	ROS 201 B	Ref. 4, pp. 1-3, 7
	ROS 201 C	Ref. 4, pp. 1-3, 7
Multi-Family Residential[1] (multi-subunit)	ROS 202 A	Ref. 4, pp. 1-3, 9; Ref. 58, p. 2
	ROS 202 B	Ref. 4, pp. 1-3, 9; Ref. 58, p. 2
Multi-Family Residential (multi-subunit)	ROS 314 A	Ref. 4, pp. 1-3, 39
	ROS 314 B	Ref. 4, pp. 1-3, 39
Multi-Family Residential (multi-subunit)	ROS 315 A	Ref. 4, pp. 1-3, 41
	ROS 315 B	Ref. 4, pp. 1-3, 41
Multi-Family Residential (multi-subunit)	ROS 316 A	Ref. 4, pp. 1-3, 43
	ROS 316 B	Ref. 4, pp. 1-3, 43
Multi-Family Residential (multi-subunit)	ROS 317 A	Ref. 4, pp. 1-3, 45
	ROS 317 B	Ref. 4, pp. 1-3, 45
Multi-Family Residential (multi-subunit)	ROS 319 A	Ref. 4, pp. 1-3, 49
	ROS 319 B	Ref. 4, pp. 1-3, 49
Multi-Family Residential (multi-subunit)	ROS 413 A	Ref. 4, pp. 1-3, 53
	ROS 413 B	Ref. 4, pp. 1-3, 53
Multi-Family Residential (multi-subunit)	ROS 416 A	Ref. 4, pp. 1-3, 55
	ROS 416 B	Ref. 4, pp. 1-3, 55
Multi-Family Residential (multi-subunit)	ROS 417 A	Ref. 4, pp. 1-3, 57
	ROS 417 B	Ref. 4, pp. 1-3, 57
Multi-Family Residential (multi-subunit)	ROS 419 A	Ref. 4, pp. 1-3, 59
	ROS 419 B	Ref. 4, pp. 1-3, 59
Multi-Family Residential (multi-subunit)	ROS 501 A	Ref. 4, pp. 1-3, 61
	ROS 501 B	Ref. 4, pp. 1-3, 61
	ROS 501 C	Ref. 4, pp. 1-3, 61
	ROS 501 D	Ref. 4, pp. 1-3, 61
Multi-Family Residential (multi-subunit)	ROS 701 A	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 701 B	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 701 C	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3

TABLE 1 – REGULARLY OCCUPIED STRUCTURES WITHIN AOE 1

	ROS 701 D	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 701 E	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 701 F	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 701 G	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 701 H	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 701 I	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
Multi-Family Residential (multi-subunit)	ROS 702 A	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 702 B	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 702 C	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 702 D	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 702 E	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 702 F	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 702 G	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
Multi-Family Residential (multi-subunit)	ROS 703 A	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 703 B	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 703 C	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 703 D	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 703 E	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
	ROS 703 F	Ref. 4, pp. 1-3, 67; Ref. 5, pp. 1-3
Multi-Family Residential (multi-subunit)	ROS 706 A	Ref. 4, pp. 1-3, 73
	ROS 706 B	Ref. 4, pp. 1-3, 73
Multi-Family Residential (multi-subunit)	ROS 715 A	Ref. 4, pp. 1-3, 87
	ROS 715 B	Ref. 4, pp. 1-3, 87
Multi-Family Residential (multi-subunit)	ROS 805 A	Ref. 4, pp. 1-3, 95
	ROS 805 B	Ref. 4, pp. 1-3, 95
	ROS 805 C	Ref. 4, pp. 1-3, 95
Multi-Family Residential (multi-subunit)	ROS 807 A	Ref. 4, pp. 1-3, 99
	ROS 807 B	Ref. 4, pp. 1-3, 99
Multi-Family Residential[1] (multi-subunit)	ROS 808 A	Ref. 4, pp. 1-3, 101; Ref. 58, p. 2
	ROS 808 B	Ref. 4, pp. 1-3, 101; Ref. 58, p. 2
Multi-Family Residential (multi-subunit)	ROS 809 A	Ref. 4, pp. 1-3, 103
	ROS 809 B	Ref. 4, pp. 1-3, 103
Multi-Family Residential (multi-subunit)	ROS 811 A	Ref. 4, pp. 1-3, 107
	ROS 811 B	Ref. 4, pp. 1-3, 107
Multi-Family Residential (multi-subunit)	ROS 906 A	Ref. 4, pp. 1-3, 121
	ROS 906 B	Ref. 4, pp. 1-3, 121
Multi-Family Residential (multi-subunit)	ROS 912 A	Ref. 4, pp. 1-3, 127
	ROS 912 B	Ref. 4, pp. 1-3, 127
Commercial	ROS 203	Ref. 4, pp. 1-3, 11
Commercial (multi-subunit)	ROS 301 A	Ref. 4, pp. 1-3, 27
	ROS 301 B	Ref. 4, pp. 1-3, 27
Commercial (multi-subunit)	ROS 318 A	Ref. 4, pp. 1-3, 47
	ROS 318 B	Ref. 4, pp. 1-3, 47
Commercial (multi-subunit)	ROS 320 A	Ref. 4, pp. 1-3, 51
	ROS 320 B	Ref. 4, pp. 1-3, 51
Commercial	ROS 399	Ref. 4, pp. 1-3; Ref. 56, p. 1
Commercial	ROS 704	Ref. 4, pp. 1-3, 69
Commercial	ROS 705	Ref. 4, pp. 1-3, 71
Commercial	ROS 707	Ref. 4, pp. 1-3, 75

TABLE 1 – REGULARLY OCCUPIED STRUCTURES WITHIN AOE 1

Commercial	ROS 708	Ref. 4, pp. 1-3, 77; Ref. 57, p. 1
Commercial	ROS 799	Ref. 4, pp. 1-3; Ref. 57, p. 1
Commercial	ROS 806	Ref. 4, pp. 1-3, 97
Commercial	ROS 901	Ref. 4, pp. 1-3, 111
Commercial	ROS 927	Ref. 4, pp. 1-3, 131
Religious Institution	ROS 801	Ref. 4, pp. 1-3, 89
Religious Institution	ROS 803	Ref. 4, pp. 1-3, 93

The numeric identifier is assigned to each structure, and the A/B/C/etc. notation identifies subunits within that structure.
[1] For scoring purposes, only ground-floor units are included in AOE 1.

Observed Exposure by Chemical Analysis

Indoor air monitoring at the Site began in September 2022 (Ref. 40, p. 3). Together, EPA-led and NMED-led field investigations have resulted in the collection of indoor air samples at 11 single-family residential structures, 11 multi-family subunits, 12 commercial structures, and two religious institution structures. Residential samples were collected over a 24-hour period, while commercial samples were collected over an 8-hour period. The exception was ROS 305 which is a residential structure operating as a commercial business, so samples were collected as a residential structure. Samples were collected using individually certified evacuated canisters equipped with flow controllers. All samples were analyzed by EPA Method Toxic Organics-15 Low Level (Ref. 6, p. 12; Ref. 7, pp. 6-7, 21, 23; Ref. 8, p. 6; Ref. 9, p. 6; Ref. 12, p. 906; Ref. 13, p. 689; Ref. 14, p. 539; Ref. 15, p. 636; Ref. 16, p. 1,792; Ref. 17, p. 873; Ref. 47, p. 8; Ref. 48, pp. 6-7; Ref. 54, pp. 1-3; Ref. 55, pp. 11-12).

All but one structure (ROS 305, background sample location) of the 36 sampled structures measured indoor air concentrations of PCE above the laboratory reporting limit. Twenty-four of the structures measured indoor air concentrations above the HRS cancer risk subsurface intrusion component benchmark of 1.08E-02 mg/m^3 (equivalent to 10.8 µg/m^3) (Ref. 2, p. 2).

Establishment of Background Levels

To document that indoor air contamination levels are significantly above background levels, an indoor air sample was collected that established a background concentration for affected structures. The background indoor air sample was collected from ROS 305 during the October 2023 Site Inspection sampling event (NMED) using an individually certified evacuated canister equipped with a 24-hour flow controller. The sample was analyzed by EPA Method Toxic Organics-15 Low Level (Ref. 9, p. 30). ROS 305 is located at the edge of the known boundary of the soil vapor contamination exhibited by passive soil gas sampling (Ref. 46, p. 4; Figure 3 of this HRS documentation record). Of the 37 sub-slab or crawlspace samples collected, the crawlspace sample from ROS 305 is the one sample result below detection limits for PCE (Ref. 9, p. 31; Ref. 11, pp. 2-3).

ROS 305 is similar in construction to other residential structures in the Site vicinity, with all sampled residential structures being constructed with wood-frame, cinder block, or stucco with a crawl space (Ref. 31, pp. 1-2, 7-8, 13-14, 19-20, 25-26, 31-32, 37-38, 43-44, 49-50, 55-56, 61-62, 67-68, 73-74, 79-80, 85-86, 91-92, 97-98, 103-104, 109-110). One commercial structure, 320A, was converted from a residential structure and is similar in construction to the residential structures in the Site vicinity with a crawlspace. All other commercial sampled structures were built with a slab-on-grade foundation (Ref. 65, pp. 1-2, 9, 18-19, 26-27, 34-35, 42-43, 50-51, 74-75, 82-83, 95-96). A specific commercial structure was not selected for background comparison because all commercial structures in the immediate Site vicinity are within the AOE and are situated above the area of soil vapor contamination, as exhibited by passive soil gas sampling (Figures 2 and 3 of this HRS documentation record and Ref. 46, p. 4).

TABLE 2 – AOE 1 BACKGROUND LOCATIONS

Field Sample ID	ROS ID, Sample Location	Start Date	Start Time	End Date	End Time	Basis for Sample as Background	References
ROS-305-41	ROS-305, Indoor, bathroom in NW corner of building	10/26/23	15:34	10/27/23	12:37	Outside AOE, Similar Structure	Figure 2; Ref. 6, p. 12; Ref. 7, pp. 21, 23

TABLE 3 – AOE 1 BACKGROUND SAMPLE CONCENTRATIONS

Field Sample ID	Eligible Hazardous Substances	Concentration (µg/m^3)	Reporting Limit (µg/m^3)	References
ROS-305-41	Tetrachloroethene	0.44 J	0.55	Ref. 9, pp. 7, 30, 174-179, 1,404; Ref. 11, pp. 1-9

µg/m^3 – Micrograms per cubic meter

J - Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value; no bias is associated with this result (Ref. 9, p. 5; Ref. 11, p. 5). Per the 2022 EPA fact sheet, *Using Qualified Data to Document an Observed Release and Observed Contamination*, results qualified J solely due to detection at or above the detection limit but below the quantitation limit are not considered to be biased, and are therefore do not require adjustment (Ref. 21, pp. 5, 6, 8).
Laboratory reporting limits are adjusted for sample size, dilution, and matrix interference (Ref. 9, p. 5, 6, 31; Ref. 11, p. 5) and are equivalent to sample quantitation limits (SQL) as defined in HRS Section 1.1, Definitions.

Background Levels

The background level for PCE for establishing observed exposure has been selected to be 0.44 µg/m^3. PCE is a man-made substance, and no other sources of PCE are known to be in the immediate Site vicinity (Ref. 50). Prior to the October 2023 Site Inspection sampling event , NMED requested that property occupants remove anthropogenic sources of chlorinated solvents that could interfere with the air sample results (Ref. 39, p. 14).

The detection limit for the background sample is identified as the reporting limit, which is defined for this analysis as the lowest concentration at which an analyte can be reliably measured and reported without qualification. The reporting limit is adjusted for sample size, dilution, and matrix interference (Ref. 9, pp. 5, 6, 31; Ref. 11, p. 5). This definition is the same as the HRS definition for Sample Quantitation Limit (SQL), which is the quantity of a substance that can be reasonably quantified given the limits of detection for the methods of analysis and sample characteristics that may affect quantitation (for example: dilution, concentration) (Ref. 1, Section 1.1). The terms can be used interchangeably in this context.

The background sample and residential observed exposure samples were collected during the same sampling event, by the same sampling team, using the same sampling technique and over a similar, approximately 24-hour period (see Figure 2 of this HRS documentation record for background location). The commercial and religious structures observed exposure samples were collected approximately one month later using the same sampling technique over a similar, approximately 8-hour period.

TABLE 4 – AOE 1 BACKGROUND LEVELS

Eligible Hazardous Substance	Background Level (µg/m^3)	Concentrations used for Establishing an Observed Exposure (µg/m^3)
Tetrachloroethene	0.44 J	≥ 1.32

µg/m^3 – Micrograms per cubic meter
J - Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value (Ref. 9, p. 5).

Exposure Samples

Indoor air concentrations of PCE greater than or equal to three times the background level of 0.44 micrograms per cubic meter (µg/m^3), an observed release criterion of 1.32 µg/m^3, and attributable to Site subsurface contamination establish an observed exposure (Ref. 1, Table 2-3).

During the October 2023 Site Inspection sampling event (NMED), ambient, background, indoor, and sub-structure air samples were collected over a 24-hour period. During the November/December 2023 commercial vapor intrusion sampling event (EPA), ambient, indoor, and sub-structure air samples were collected over an 8-hour period. Both sampling events used individually certified evacuated canisters equipped with flow controllers. All samples were analyzed by EPA Method Toxic Organics-15 Low Level (Ref. 8, p. 6; Ref. 9, p. 6; Ref. 12, p. 906; Ref. 13, p. 689; Ref. 14, p. 539; Ref. 15, p. 636; Ref. 16, p. 1,792; Ref. 17, p. 873).

TABLE 5 – AOE 1 OBSERVED EXPOSURE SAMPLE LOCATIONS

ROS ID	Lab Sample ID	Field Sample ID	Sample Location	Start Date	Start Time	End Date	End Time	References
118B	140-34215-10	ROS-118B-41	Indoor residential – bedroom	10/24/23	13:48	10/25/23	11:11	Ref. 4, pp. 1-3, 5; Ref. 6, p. 3; Ref. 7, pp. 13, 15; Ref. 8, pp. 7, 2,409
203[1]	L2371221-05	DOS-AA-ID-1-20231201-1	Indoor commercial – main office	12/1/23	7:14	12/1/23	14:47	Ref. 4, pp. 1-3, 11; Ref. 15, pp. 110, 115; Ref. 47, pp. 8-9, 15, 18; Ref. 48, pp. 6, 10; Ref. 54, p. 3
221	140-34215-16	ROS-221-41	Indoor residential – living room	10/25/23	13:46	10/26/23	10:45	Ref. 4, pp. 1-3, 23; Ref. 6, p. 8; Ref. 7, pp. 17, 19; Ref. 8, pp. 7, 2,410
222	140-34216-18	ROS-222-41	Indoor residential – bedroom	10/25/23	14:49	10/26/23	11:33	Ref. 4, pp. 1-3, 25; Ref. 6, p. 10; Ref. 7, pp. 17, 19; Ref. 9, pp. 7, 1,404
314B	140-34216-15	ROS-314B-41	Indoor residential – kitchen	10/26/23	13:36	10/27/23	10:41	Ref. 4, pp. 1-3, 39; Ref. 6, p. 15; Ref. 7, pp. 20, 22; Ref. 9, pp. 7, 1,403
317A	140-34215-9	ROS-317A-41	Indoor residential – living room	10/24/23	15:37	10/25/23	13:05	Ref. 4, pp. 1-3, 45; Ref. 6, p. 18; Ref. 7, pp. 14, 16; Ref. 8, pp. 7, 2,409-2,412
320A	L2370880-05	D9S-AA-ID-1-20231130-1	Indoor commercial – front room	11/30/23	9:07	11/30/23	16:22	Ref. 4, pp. 1-3, 51; Ref. 12, pp. 8, 12; Ref. 47, pp. 13, 14; Ref. 48, p. 10; Ref. 54, p. 1
413A	140-34216-16	ROS-413-41	Indoor residential – living room	10/26/23	14:37	10/27/23	11:35	Ref. 4, pp. 1-3, 53; Ref. 6, p. 20; Ref. 7, pp. 31, 32; Ref. 9, pp. 7, 1,403
602[1]	140-34216-11	ROS-602-41	Indoor residential – bedroom hallway	10/26/23	13:42	10/27/23	10:35	Ref. 4, pp. 1-3, 63; Ref. 6, p. 22; Ref. 7, pp. 31, 32; Ref. 9, pp. 7, 1,403
620	140-34216-3	ROS-620-41	Indoor residential – back room	10/24/23	14:47	10/25/23	11:59	Ref. 4, pp. 1-3, 65; Ref. 6, p. 24; Ref. 7, pp. 14, 16; Ref. 9, pp. 7, 1,402
701A	140-34215-27	ROS-701A-41	Indoor residential – kitchen	10/23/23	14:01	10/24/23	11:48	Ref. 4, pp. 1-3, 67; Ref. 6, p. 27; Ref. 7, pp. 24, 26; Ref. 8, pp. 7, 2412
701D	140-34215-18	ROS-701D-41	Indoor residential – living room	10/23/23	13:06	10/24/23	10:21	Ref. 4, pp. 1-3, 67; Ref. 6, p. 28; Ref. 7, pp. 11, 13; Ref. 8, pp. 7, 2,411
701H	140-34215-28	ROS-701H-41	Indoor residential – kitchen	10/23/23	14:00	10/24/23	11:29	Ref. 4, pp. 1-3, 67; Ref. 6, p. 29; Ref. 7, pp. 11, 13; Ref. 8, pp. 7, 2,412
702A	140-34215-24	ROS-702A-41	Indoor residential – living room	10/23/23	13:54	10/24/23	10:37	Ref. 4, pp. 1-3, 67; Ref. 6, p. 31; Ref. 7, pp. 24, 25; Ref. 8, pp. 7, 2,412
702F[1]	140-34215-25	ROS-702F-41	Indoor residential – TV room	10/23/23	13:41	10/24/23	10:30	Ref. 4, pp. 1-3, 67; Ref. 6, p. 32; Ref. 7, pp. 24, 25; Ref. 8, pp. 7, 2,412
703A	140-34215-29	ROS-703A-41	Indoor residential – kitchen	10/23/23	13:33	10/24/23	11:02	Ref. 4, pp. 1-3, 67; Ref. 6, p. 34; Ref. 7, pp. 11, 13; Ref. 8, pp. 7, 2,412
703F	140-34216-17	ROS-703F-41	Indoor residential – kitchen	10/25/23	16:19	10/26/23	13:05	Ref. 4, pp. 1-3, 67; Ref. 6, p. 35; Ref. 7, pp. 18, 20; Ref. 9, pp. 7, 1,404
704[1]	L2371418-05	AS-AA-ID-2-20231201-1	Indoor commercial – main room	12/1/23	8:34	12/1/23	15:18	Ref. 4, pp. 1-3, 69; Ref. 17, pp. 98, 102; Ref. 47, pp. 16, 18; Ref. 48, p. 10; Ref. 54, p. 2
705[1]	L2371223-04	CCC-AA-ID-3-20231201-1	Indoor commercial – conference room	12/1/23	9:08	12/1/23	15:36	Ref. 4, pp. 1-3, 71; Ref. 16, pp. 98, 102; Ref. 47, pp. 16, 18; Ref. 48, p. 10; Ref. 54, p. 2

707	L2371223-01	R-AA-ID-1-20231201-1	Indoor commercial – office	12/1/23	8:24	12/1/23	15:30	Ref. 4, pp. 1-3, 75; Ref. 16, pp. 98, 102; Ref. 47, pp. 15, 18; Ref. 48, p. 10; Ref. 54, p. 3
708	L2371418-02	CWH-AA-ID-1-20231201-1	Indoor commercial – middle/back of building	12/1/23	8:52	12/1/23	16:00	Ref. 4, pp. 1-3, 77; Ref. 17, pp. 98, 102; Ref. 47, pp. 16, 18; Ref. 48, p. 10; Ref. 54, p. 2; Ref. 57, p. 1
709[1]	140-34215-23	ROS-709-42	Indoor residential – living room	10/24/23	13:34	10/25/23	10:31	Ref. 4, pp. 1-3, 79; Ref. 6, p. 37; Ref. 7, pp. 26, 27; Ref. 8, pp. 7, 2,411
712	140-34215-21	ROS-712-41	Indoor residential – living room	10/24/23	14:28	10/25/23	11:32	Ref. 4, pp. 1-3, 83; Ref. 6, p. 39; Ref. 7, pp. 26, 28; Ref. 8, pp. 7, 2,411
713	140-34215-20	ROS-713-41	Indoor residential – living room	10/24/23	15:40	10/25/23	12:30	Ref. 4, pp. 1-3, 85; Ref. 6, p. 41; Ref. 7, pp. 26, 28; Ref. 8, pp. 7, 2,411
799	L2371418-03	COS-AA-ID-1-20231201-1	Indoor commercial – middle of building	12/1/23	8:56	12/1/23	16:21	Ref. 4, pp. 1-3; Ref. 17, pp. 98, 102; Ref. 47, pp. 16, 19; Ref. 48, p. 10; Ref. 54, p. 2; Ref. 57, p. 1
801[1]	L2370885-04	LTC-AA-ID-3-20231130-1	Indoor religious structure – nursery	11/30/23	8:44	11/30/23	16:03	Ref. 4, pp. 1-3, 89; Ref. 13, pp. 106, 111; Ref. 47, pp. 13, 14; Ref. 48, p. 10; Ref. 54, p. 1
803[1]	L2371221-04	CBC-AA-ID-3-20231201-1	Indoor religious structure – south room	12/1/23	8:12	12/1/23	13:22	Ref. 4, pp. 1-3, 93; Ref. 15, pp. 110, 115; Ref. 47, pp. 15, 18; Ref. 48, p. 10; Ref. 54, p. 3
806[1]	L2371216-05	USB-AA-ID-2-20231201-1	Indoor commercial – main room	12/1/23	8:42	12/1/23	15:54	Ref. 4, pp. 1-3, 97; Ref. 14, pp. 7, 11; Ref. 47, pp. 16, 19; Ref. 48, p. 10; Ref. 54, p. 3
812[1]	140-34215-14	ROS-812-41	Indoor residential – kitchen	10/25/23	14:34	10/26/23	11:36	Ref. 4, pp. 1-3, 109; Ref. 6, p. 43; Ref. 7, pp. 28, 30; Ref. 8, pp. 7, 2,410
901	L2370885-05	RZA-AA-ID-1-20231130-1	Indoor commercial – front office	11/30/23	8:15	11/30/23	15:32	Ref. 4, pp. 1-3, 111; Ref. 13, pp. 106, 111; Ref. 47, pp. 12, 14; Ref. 48, p. 10; Ref. 54, p. 1
908	140-34215-13	ROS-908-41	Indoor residential – bedrooms hallway	10/25/23	15:47	10/26/23	12:33	Ref. 4, pp. 1-3, 123; Ref. 6, p. 45; Ref. 7, pp. 29, 31; Ref. 8, pp. 7, 2,410
914	140-34215-12	ROS-914-41	Indoor residential – living room	10/25/23	13:43	10/26/23	10:30	Ref. 4, pp. 1-3, 129; Ref. 6, p. 47; Ref. 7, pp. 28, 30; Ref. 8, pp. 7, 2,410
927[1]	L2370880-02	IPN-AA-ID-1-20231130-1	Indoor commercial – front office	11/30/23	8:22	11/30/23	15:43	Ref. 4, pp. 1-3, 131; Ref. 12, pp. 8, 12; Ref. 47, pp. 12, 14; Ref. 48, p. 10; Ref. 54, p. 1

[1]In structures where multiple or duplicate samples were collected, the sample with the highest result is displayed.

TABLE 6 – AOE 1 OBSERVED EXPOSURE SAMPLE CONCENTRATIONS

ROS ID	Lab Sample ID	Field Sample ID	Eligible Hazardous Substance	Concentration (µg/m^3)	Reporting Limit (µg/m^3)	References
118B	140-34215-10	ROS-118B-41	Tetrachloroethene	6.6	0.55	Ref. 4, pp. 1-3, 5; Ref. 8, pp. 7, 17, 118-122, 2,409; Ref. 10, pp. 1-10
203[1]	L2371221-05	DOS-AA-ID-1-20231201-1	Tetrachloroethene	189	1.36	Ref. 4, pp. 1-3, 11; Ref. 15, pp. 105, 110, 115, 516, 559; Ref. 22, p. 19; Ref. 55, pp. 19-20
221	140-34215-16	ROS-221-41	Tetrachloroethene	75	0.98	Ref. 4, pp. 1-3, 23; Ref. 8, pp. 7, 23, 148-152, 2,410; Ref. 10, pp. 1-10

TABLE 6 – AOE 1 OBSERVED EXPOSURE SAMPLE CONCENTRATIONS

222	140-34216-18	ROS-222-41	Tetrachloroethene	13	0.55	Ref. 4, pp. 1-3, 25; Ref. 9, pp. 7, 25, 149-153, 1,404; Ref. 11, pp. 1-9
314B	140-34216-15	ROS-314B-41	Tetrachloroethene	7.1	0.58	Ref. 4, pp. 1-3, 39; Ref. 9, pp. 7, 22, 134-138, 1,403; Ref. 11, pp. 1-9
317A	140-34215-9	ROS-317A-41	Tetrachloroethene	24	0.59	Ref. 4, pp. 1-3, 45; Ref. 8, pp. 7, 16, 113-117, 2,409; Ref. 10, pp. 1-10
320A	L2370880-05	D9S-AA-ID-1-20231130-1	Tetrachloroethene	90.2	1.36	Ref. 4, pp. 1-3, 51; Ref. 12, pp. 3, 8, 12, 780, 844; Ref. 19, p. 19; Ref. 55, pp. 19-20
413A	140-34216-16	ROS-413-41	Tetrachloroethene	5	0.54	Ref. 4, pp. 1-3, 53; Ref. 9, pp. 7, 23, 139-143, 1,403; Ref. 11, pp. 1-9
602[1]	140-34216-11	ROS-602-41	Tetrachloroethene	26	0.55	Ref. 4, pp. 1-3, 63; Ref. 9, pp. 7, 18, 113-117, 1,403; Ref. 11, pp. 1-9
620	140-34216-3	ROS-620-41	Tetrachloroethene	9.4	0.59	Ref. 4, pp. 1-3, 65; Ref. 9, pp. 7, 10, 69-75, 1,402; Ref. 11, pp. 1-9
701A	140-34215-27	ROS-701A-41	Tetrachloroethene	14	0.63	Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 34, 214-218, 2,412; Ref. 10, pp. 1-10
701D	140-34215-18	ROS-701D-41	Tetrachloroethene	37	0.55	Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 25, 158-162, 2,411; Ref. 10, pp. 1-10
701H	140-34215-28	ROS-701H-41	Tetrachloroethene	8.2	0.61	Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 35, 219-223, 2,412; Ref. 10, pp. 1-10
702A	140-34215-24	ROS-702A-41	Tetrachloroethene	51	0.58	Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 31, 199-203, 2,412; Ref. 10, pp. 1-10
702F[1]	140-34215-25	ROS-702F-41	Tetrachloroethene	10	0.56	Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 32, 204-208, 2,412; Ref. 10, pp. 1-10
703A	140-34215-29	ROS-703A-41	Tetrachloroethene	110	0.60	Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 36, 224-228, 2,412; Ref. 10, pp. 1-10
703F	140-34216-17	ROS-703F-41	Tetrachloroethene	13	0.59	Ref. 4, pp. 1-3, 67; Ref. 9, pp. 7, 24, 144-148, 1,404; Ref. 11, pp. 1-9
704[1]	L2371418-05	AS-AA-ID-2-20231201-1	Tetrachloroethene	1090	3.39	Ref. 4, pp. 1-3, 69; Ref. 17, pp. 93, 98, 102, 746, 811; Ref. 24, pp. 4, 21; Ref. 55, pp. 19-20
705[1]	L2371223-04	CCC-AA-ID-3-20231201-1	Tetrachloroethene	319	1.36	Ref. 4, pp. 1-3, 71; Ref. 16, pp. 93, 98, 102, 1,658, 1,733; Ref. 25, p. 19; Ref. 55, pp. 19-20
707	L2371223-01	R-AA-ID-1-20231201-1	Tetrachloroethene	3170 JK (317)*	1.36	Ref. 4, pp. 1-3, 75; Ref. 16, pp. 93, 98, 102, 1,648, 1,722; Ref. 25, pp. 3, 4, 8; Ref. 21, pp. 1, 8, 9; Ref. 55, pp. 19-20
708	L2371418-02	CWH-AA-ID-1-20231201-1	Tetrachloroethene	274	1.36	Ref. 4, pp. 1-3, 77; Ref. 17, pp. 93, 98, 102, 734, 800; Ref. 24, p. 10; Ref. 55, pp. 19-20
709[1]	140-34215-23	ROS-709-42	Tetrachloroethene	210	2.5	Ref. 4, pp. 1-3, 79; Ref. 8, pp. 7, 30, 194-198, 2,411; Ref. 10, pp. 1-10
712	140-34215-21	ROS-712-41	Tetrachloroethene	49	0.54	Ref. 4, pp. 1-3, 83; Ref. 8, pp. 7, 28, 173-178, 2,411; Ref. 10, pp. 1-10

TABLE 6 – AOE 1 OBSERVED EXPOSURE SAMPLE CONCENTRATIONS

713	140-34215-20	ROS-713-41	Tetrachloroethene	12	0.64	Ref. 4, pp. 1-3, 85; Ref. 8, pp. 7, 27, 168-172, 2,411; Ref. 10, pp. 1-10
799	L2371418-03	COS-AA-ID-1-20231201-1	Tetrachloroethene	113	1.36	Ref. 4, pp. 1-3; Ref. 17, pp. 93, 98, 102, 737, 803; Ref. 24, p. 13; Ref. 55, pp. 19-20
801[1]	L2370885-04D	LTC-AA-ID-3-20231130-1	Tetrachloroethene	1760	13.6	Ref. 4, pp. 1-3, 89; Ref. 13, pp. 101, 106, 111, 571, 618; Ref. 20, pp. 4, 20; Ref. 55, pp. 19-20
803[1]	L2371221-04	CBC-AA-ID-3-20231201-1	Tetrachloroethene	144	1.36	Ref. 4, pp. 1-3, 93; Ref. 15, pp. 105, 110, 115, 513, 556; Ref. 22, p. 16; Ref. 55, pp. 19-20
806[1]	L2371216-05	USB-AA-ID-2-20231201-1	Tetrachloroethene	82.7	1.36	Ref. 4, pp. 1-3, 97; Ref. 14, pp. 2, 7, 11, 434, 483; Ref. 23, p. 19; Ref. 55, pp. 19-20
812[1]	140-34215-14	ROS-812-41	Tetrachloroethene	2.4	0.62	Ref. 4, pp. 1-3, 109; Ref. 8, pp. 7, 21, 138-142, 2,410; Ref. 10, pp. 1-10
901	L2370885-05	RZA-AA-ID-1-20231130-1	Tetrachloroethene	36.1	1.36	Ref. 4, pp. 1-3, 111; Ref. 13, pp. 101, 106, 111, 573, 621; Ref. 20, p. 23; Ref. 55, pp. 19-20
908	140-34215-13	ROS-908-41	Tetrachloroethene	17	0.61	Ref. 4, pp. 1-3, 123; Ref. 8, pp. 7, 20, 133-137, 2,410; Ref. 10, pp. 1-10
914	140-34215-12	ROS-914-41	Tetrachloroethene	2.2	0.54	Ref. 4, pp. 1-3, 129; Ref. 8, pp. 7, 19, 128-132, 2,410; Ref. 10, pp. 1-10
927[1]	L2370880-02	IPN-AA-ID-1-20231130-1	Tetrachloroethene	108	1.36	Ref. 4, pp. 1-3, 131; Ref. 12, pp. 3, 8, 12, 771, 835; Ref. 19, p. 10; Ref. 55, pp. 19-20

$\mu g/m^3$ - Micrograms per cubic meter
*JK - Result was qualified as estimated with an unknown bias; result was re-analyzed on dilution and is an approximate value; result was associated with a high laboratory control sample recovery (Ref. 25, pp. 3, 4). The concentration shown in parentheses is adjusted in accordance with the 2022 EPA fact sheet *Using Qualified Data to Document an Observed Release and Observed Contamination* (Ref. 21, pp. 1, 8, 9).
Laboratory reporting limits are adjusted for sample size, dilution, and matrix interference (Ref. 10, p. 6; Ref. 11, p. 5; Ref. 19, p. 4; Ref. 20, p. 4; Ref. 22, p. 4; Ref. 23, p. 4; Ref. 24, p. 4; Ref. 25, pp. 3, 4) and are equivalent to SQL as defined in HRS Section 1.1, Definitions.

[1]In structures where multiple or duplicate samples were collected, the sample with the highest result is displayed.

Attribution to Subsurface and Facilities

Association of Releases of PCE with Historical Dry Cleaner Operations

Historical dry-cleaning operations are often the source of environmental releases of chlorinated solvents due to the absence of pollution prevention controls on historical dry-cleaning machines or improper storage and waste disposal practices at historical facilities (Ref. 26, p. 2; Ref. 27, pp. 8, 20-21). Two historical dry cleaners operated at the South Carlisle Shopping Village strip mall. According to Albuquerque city directory records, Carlisle Village Cleaners operated as a dry cleaner at 3611 Simms Avenue SE from 1953 to 1975 (Ref. 30, pp. 1-3, 10-11). L&M Laundry and Cleaners operated as a dry cleaner at 3607 Simms Avenue SE from 1969 to 2017 (Ref. 30, pp. 8-9, 15-17).

Before the Resource Conservation and Recovery Act was promulgated in November 1980, there was little regulation or oversight over hazardous wastes generated at dry cleaning operations (Ref. 27, p. 16). During the operational period of the two historical dry cleaners (Carlisle Village Cleaners from 1953 to 1975 and L&M Laundry and Cleaners from 1969 to 2017), dry-cleaning machine technology was still evolving (Ref. 26, p. 2). Between the 1920s and 1960s, “first-generation machines”, also known as transfer machines, were the most common dry-cleaning machine in use (Ref. 27, pp. 6, 7). Because first-generation machines required the operator to manually transfer garments between the washer and tumbler, solvent vapor release was common (Ref. 27, p. 6). “Second-generation machines”, also known as vented dry-to-dry machines, allowed for garments to be cleaned in a single machine (Ref. 27, p. 7). By the time third-generation, or closed-loop machines, were introduced in the late 1970s, more dry-cleaning machines were equipped with early pollution prevention controls, including carbon adsorption units and refrigerated condensers to recover solvent from vapors (Ref. 27, p. 7-8). In addition, first- and second-generation dry-cleaning machines had low “solvent mileage” and required much higher quantities of PCE to clean a unit of clothing than machines introduced later (Ref. 26, p. 2; Ref. 27, p. 8).

Besides machine limitations and poor housekeeping practices, the relatively high vapor pressure and vapor density of PCE can cause PCE vapors to emanate from storage containers in indoor, confined spaces and, with restricted air flow, the dense PCE vapors can penetrate concrete flooring and enter the upper vadose zone to form a “vapor cloud” (Ref. 66, p. 1). Continued density-derived pressure can move PCE vapors further into the subsurface to where gaseous diffusion begins to control the movement of subsurface vapors (Ref. 66, p. 1). “Vapor clouds” reaching tens of feet into the upper vadose zone have been documented without corresponding soil contamination (Ref. 66, p. 1). Dry cleaners are a known commercial operation susceptible to this contaminant transport mechanism (Ref. 66, p. 1).

It is estimated that in 1962, when PCE became the preferred solvent in dry-cleaning operations in the United States, approximately 90% of PCE consumed was by the dry-cleaning industry (Ref. 28, p. 3). In 1990, approximately 50% of the PCE consumed in the United States was by the dry-cleaning and textile processing industry (Ref. 28, p. 5).

Evidence of PCE Migration from the South Carlisle Shopping Village Strip Mall to Below Contaminated Structures

During the January/May/June 2023 passive soil gas sampling events (EPA), 122 passive soil gas samplers were deployed within a 1,000-foot radius of the strip mall to provide an initial evaluation of the horizontal extent of the soil vapor contamination (Figure 3 of this HRS documentation record; Ref. 40, pp. 21-26; Ref. 41, pp. 7-9; Ref. 43, pp. 1,332-1,335; Ref. 44, pp. 733-734; Ref. 45, pp. 1,040-1,042; Ref. 46, p. 4). The results indicated that the highest concentrations of PCE in soil vapor were located between the bounds of Carlisle Boulevard SE to the west, Thaxton Avenue SE to the south, Hermosa Dr SE to the east, and the alleyway just north of the strip mall to the north, correlating with a historical release or releases at the South Carlisle Shopping Village strip mall. The results further indicated that the soil vapor contamination has migrated radially in all directions, with detectable PCE concentrations found at the 1,000-foot boundary in most samples (Ref. 39, pp. 39-40; Ref. 46, p. 4). The November/December 2023 subsurface characterization event (NMED) confirmed that the first 105 feet of the Site subsurface consists mostly of sand units, with thin and intermittent fine-grained units present in two hydrostratigraphic units (Ref. 33, pp. 13, 17-19). The coarse-grained geologic materials allow subsurface vapor to migrate radially in all directions via gaseous diffusion (Ref. 29, p. 46; Ref. 33, pp. 17-19).

Additionally, there are 37 sub-slab or crawlspace samples corresponding to 27 sampled structures. Of these, 36 sample results exhibited PCE detections for 26 corresponding structures, with the highest detections occurring in sub-slab samples. For both sub-slab samples and crawlspace samples, structures closer to the strip mall generally exhibited higher detections of PCE. The one sample result below detection limits for PCE was collected from the crawlspace beneath ROS 305, the structure from which a background indoor air sample was collected, and located at the edge of the known boundary of the soil vapor contamination (Ref. 8, pp. 8-15, 18, 24; Ref. 9, pp. 8, 9, 12-17, 27-29, 31; Ref. 10; Ref. 11; Ref. 12, p. 777; Ref. 19, p. 16; Ref. 49, pp. 11, 15, 19, 22, 26, 30; Ref. 67, pp. 11, 16, 21, 26; Ref. 68, pp. 9, 13, 17, 21; Ref. 69, pp. 9, 14, 19, 24; Ref. 70, pp. 8, 12, 16, 20; Ref. 71, pp. 8, 12, 16, 19, 23, 27; Figure 3 of this HRS documentation record).

The pattern of subsurface contamination points to both former dry cleaners collectively as the origin of contamination. It is not possible to determine which facility the contamination originated at due to the proximity of the former facilities, the comingling of contamination over time, the lack of records concerning historic spills or releases, and the amount of time that has elapsed since the release, or releases, took place.

Lack of Structural Containment Permanently Preventing Vapor Intrusion

Hazardous vapors in the vadose zone can enter overlying structures as a component of gas by migrating through cracks, seams, interstices, utility conduits, or other gaps in foundations (Ref. 29, pp. 48-49). During the NMED October 2023 Site Inspection sampling event, it was noted that all sampled residential structures were wood-frame, cinder block, or stucco structures with crawl spaces (Ref. 31). None of the sampled residential structures had radon mitigation or vapor or moisture barriers in place (Ref. 31). During November/December 2023 commercial vapor intrusion sampling event (EPA), the sampled commercial structures were recorded as wood-frame, cinder block, stucco, or brick structures (Ref. 65). All but one commercial sampled structure (ROS-320A, built over a crawl space) was constructed with a slab-on-grade foundation (Ref. 65, p. 9). None of the commercial sampled structures were equipped with a radon mitigation or sub-slab vapor or moisture barrier. The five commercial sampled structures that comprise the South Carlisle Shopping Village strip mall (ROS 705 – Child Counseling Center, ROS 708 – Coffee Warehouse, ROS 799 – Coffee Office Space, ROS 707 – Realtor, and ROS 704 – Art Studio) have been provided with indoor air purifying units; however, although such units reduce contaminant concentrations in indoor air, they do not prevent initial intrusion of vapors into structures (Ref. 40, pp. 7-10; Ref. 65). Based on tax assessor records, the residential neighborhood within AOE 1 was primarily built between 1946 and 1951 while the sampled commercial structures were built between 1949 and 1975 (Ref. 4, pp. 1-3).

Consideration of Anthropogenic Sources

One week prior to the October 2023 Site Inspection sampling event (NMED), NMED field personnel visited with each property owner or occupant to discuss preparing the structure for the sampling event (Ref. 7, pp. 2-10; Ref. 31). NMED requested that potential anthropogenic sources of the Site contaminants of concern be temporarily relocated to an outdoor shed, sealed-off garage, or other location prior to the indoor air sampling event to minimize the influence of anthropogenic sources on indoor air quality (Ref. 7, pp. 2-10; Ref. 39, p. 14).

In November 2023, the EPA Removal Program conducted building surveys for commercial structures to be sampled and visited with property owners prior to collecting indoor air samples. EPA identified and assisted with relocating potential anthropogenic sources prior to indoor air sampling (Ref. 48, pp. 6, 8-9; Ref. 55 pp. 14-15; Ref. 65, pp. 1, 6, 10, 15, 18, 23, 26, 31, 34, 39, 42, 47, 50, 55, 58, 63, 66, 71, 74, 79, 82, 87, 95, 100).

Four structures or subunits, ROS 221, 702F, 801, and 901, still had chemicals that potentially contained VOCs present within the structure during indoor air sampling. The cleaning chemicals present within ROS 801 were kept in a closet that remained closed during sampling (Ref. 31, pp. 49, 109, 114; Ref. 47, p. 13; Ref. 48, p. 9; Ref. 65, pp. 58, 63, 82, 87). Four indoor air samples (L2370885-01 through L2370885-04) were collected from various locations in ROS 801 and exhibited similar concentrations of PCE (Ref. 13, pp. 2, 10, 14, 18, 22; Ref. 20, pp. 8, 12, 16, 20; Ref. 65, p. 58, 65). Samples collected from subunits nearby to ROS 702F in the same apartment complex exhibited similar concentrations of PCE (Ref. 8, pp. 25, 31, 34, 35, 36; Ref. 9, p. 24). All four structures or subunits have corresponding sub-slab or crawlspace samples that exhibited detections of PCE, with significantly higher concentrations detected beneath ROS 801 and 901 (which have slab-on-grade foundations) compared to indoor air samples (Ref. 8, pp. 8, 18; Ref. 49, pp. 15, 19, 22, 26).

Additionally, passive soil gas sampling indicates that all four structures or subunits are located above the area of PCE-contaminated soil vapor (Ref. 46, p. 4). This indicates the primary pathway of PCE contamination appears to be from soil vapor contamination below the structures or subunits, and it is unlikely that potentially-VOC-containing chemicals significantly contributed to the indoor air PCE concentrations in these sampled structures or subunits.

Consideration of Ambient Air Contamination

Outdoor, ambient air sampling was conducted during each day of indoor air sampling activities during the October 2023 Site Inspection sampling event (NMED) and November/December 2023 Integrated Assessment sampling event (EPA) to characterize background, ambient air quality in the Site vicinity and to assess the influence of potential ambient air contamination on indoor air quality. Four ambient air samples were collected during the October 2023 Site Inspection sampling event (NMED). The analytical results identified trace concentrations of PCE in three samples (ROS-221-11 [0.28 $\mu g/m^3$], ROS-314-11 [0.33 $\mu g/m^3$], and ROS-317-11 [0.37 $\mu g/m^3$], all J-flagged) and one PCE concentration of 1.7 $\mu g/m^3$ in ROS-701-11 (Ref. 8, p. 26; Ref. 9, pp. 11, 21, 26). Two ambient air samples (Lab ID: L2371216-02 and L2371216-03) were collected during the November/December Integrated Assessment sampling event (EPA). The analytical results identified ambient air PCE concentrations of 1.34 $\mu g/m^3$ (J-flagged) and 2.10 $\mu g/m^3$ (Ref. 14, p. 474, 477).

There are 37 sub-slab or crawlspace samples corresponding to 27 sampled structures. Of these, 36 sample results exhibited PCE detections for 26 corresponding structures, with the highest detections occurring in sub-slab samples. For both sub-slab samples and crawlspace samples, structures closer to the strip mall generally exhibited higher detections of PCE. The one sample result below detection limits for PCE was collected from the crawlspace beneath ROS 305, the structure from which a background indoor air sample was collected, and located at the edge of the known boundary of the soil vapor contamination (Ref. 8, pp. 8-15, 18, 24; Ref. 9, pp. 8, 9, 12-17, 27-29, 31; Ref. 10; Ref. 11; Ref. 12, p. 777; Ref. 19, p. 16; Ref. 49, pp. 11, 15, 19, 22, 26, 30; Ref. 67, pp. 11, 16, 21, 26; Ref. 68, pp. 9, 13, 17, 21; Ref. 69, pp. 9, 14, 19, 24; Ref. 70, pp. 8, 12, 16, 20; Ref. 71, pp. 8, 12, 16, 19, 23, 27; Figure 3 of this HRS documentation record). This matches the pattern of PCE contamination exhibited by the passive soil gas sampling (Ref. 46, p. 4). Additionally, as shown in Figure 3 of this HRS documentation record, many of the soil gas and sub-slab samples exhibited very elevated concentrations in the subsurface throughout the AOE (points showing levels at or above 1,000 $\mu g/m^3$ are found throughout the AOE). This indicates the primary pathway of PCE contamination appears to be from soil vapor contamination below the structures or subunits, and it is unlikely that outdoor air is significantly contributing to the elevated levels of indoor air PCE concentrations seen at the Site.

TABLE 7 – AOE 1 AMBIENT AIR ATTRIBUTION SAMPLE LOCATIONS

Lab Sample ID	Field Sample ID	Sample Location	Start Date	Start Time	End Date	End Time	References
140-34215-19	ROS-701-11	Ambient air, outside of ROS	10/23/23	12:53	10/24/23	09:40	Ref. 6, p. 25; Ref. 7, pp. 11, 13; Ref. 8, p. 7
140-34216-4	ROS-317-11	Ambient air, outside of ROS	10/24/23	12:54	10/25/23	09:39	Ref. 6, p. 16; Ref. 7, pp. 13, 15; Ref. 9, p. 7
140-34216-19	ROS-221-11	Ambient air, outside of ROS	10/25/23	12:53	10/26/23	09:43	Ref. 6, p. 6; Ref. 7, pp. 16, 19; Ref. 9, p. 7
140-34216-14	ROS-314-11	Ambient air, outside of ROS	10/26/23	12:39	10/27/23	09:41	Ref. 6, p. 13; Ref. 7, pp. 20, 22; Ref. 9, p. 7
L2371216-02	CVC-AA-OD-1-20231130-1	Outdoors, east of ROS 801	11/30/23	8:56	11/30/23	16:08	Ref. 14, pp. 7, 11; Ref. 47, pp. 13, 14; Ref. 48, p. 10; Ref. 54, p. 1; Ref. 55, pp. 19-20
L2371216-03	CVC-AA-OD-1-20231201-1	Outdoors, east of ROS 801	12/1/23	7:40	12/1/23	14:09	Ref. 14, pp. 7, 11; Ref. 47, pp. 15, 18; Ref. 48, p. 10; Ref. 54, p. 2; Ref. 55, pp. 19-20

TABLE 8 – AOE 1 AMBIENT AIR ATTRIBUTION SAMPLE CONCENTRATIONS

Lab Sample ID	Field Sample ID	Hazardous Substance	Concentration (μg/m^3)	Reporting Limit (μg/m^3)	References
140-34215-19	ROS-701-11	Tetrachloroethene	1.7	0.56	Ref. 8, pp. 7, 26, 163-167, 2,411; Ref. 10, pp. 1-10
140-34216-4	ROS-317-11	Tetrachloroethene	0.37 J	0.54	Ref. 9, pp. 7, 11, 76-80, 1,402; Ref. 11, pp. 1-9
140-34216-19	ROS-221-11	Tetrachloroethene	0.28 J	0.58	Ref. 9, pp. 7, 26, 154-158, 1,404; Ref. 11, pp. 1-9
140-34216-14	ROS-314-11	Tetrachloroethene	0.33 J	0.55	Ref. 9, pp. 7, 21, 129-133, 1,403; Ref. 11, pp. 1-9
L2371216-02	CVC-AA-OD-1-20231130-1	Tetrachloroethene	2.1	1.36	Ref. 14, pp. 7, 11, 425, 474; Ref. 23, p. 10
L2371216-03	CVC-AA-OD-1-20231201-1	Tetrachloroethene	1.34 JQK*	1.36	Ref. 14, pp. 7, 11, 428, 477; Ref. 21, pp. 1, 8, 9; Ref. 23, pp. 2, 4, 13

μg/m^3 – Micrograms per cubic meter
J and JQK – Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value (Ref. 9, p. 5; Ref. 23, pp. 2, 4).
Laboratory reporting limits are adjusted for sample size, dilution, and matrix interference (Ref. 10, p. 6; Ref. 11, p. 5; Ref. 14, p. 540) and are equivalent to SQL as defined in HRS Section 1.1, Definitions.

Consideration of Other Possible Sources of PCE

In 2021, NMED catalogued all historical dry cleaning, laundry, and laundry supply business in the Albuquerque metropolitan area by examining City directory records (Ref. 36). The listed businesses were plotted on Google Earth and the locations of the listed businesses were compared to the extent of known subsurface PCE contamination (Ref. 51). Five inventoried dry cleaners or laundries, including Carlisle Village Cleaners and L&M Laundry and Cleaners, are located above the extent of subsurface PCE contamination identified in the January/May/June 2023 passive soil gas sampling events (EPA) (Ref. 46, p. 4; Ref. 51). The three additional businesses include Village Laundry, which was listed as a laundry at 3607 Simms Avenue SE from approximately 1962 to 1968 (Ref. 30, pp. 4-7), Day and Night Laundry/Twentieth Century Laundry, which was listed as a self-serve laundry at 1116 Carlisle Boulevard SE from approximately 1962 to 1982, and Rockefeller's Cleaners Company, which was listed as a cleaner or dyer at 1104 Hermosa Drive SE from 1986 through 1990 and is also a known satellite location of the present day Rockefeller's Cleaning Company (Ref. 34, p. 9; Ref. 52; Ref. 53). It is unlikely that any of the three listed businesses operated as dry cleaners based on the City directory records, and therefore unlikely that any of the three businesses used PCE in large enough quantities to substantially contribute to the identified contamination.

A search for other possible sources of PCE contamination located within a half-mile of the Site did not identify any facilities within EPA's Envirofacts Database (Ref. 50). In addition, the contaminants being scored in this HRS documentation record are man-made substances not found naturally in the environment.

Structure Containment

As presented above in the AOE, there are 21 residential, 10 commercial, and 2 religious regularly occupied structures or subunits that have observed exposure documented through chemical analysis and are therefore assigned a containment value of 10 (Ref. 1, Table 5-12). Consistent with HRS Section 5.2.1.1.2.1, for all the regularly occupied structures with unknown containment features, a structure containment value of greater than zero is assigned.

TABLE 9 – AOE STRUCTURE CONTAINMENT

ROS ID	Structure Containment Factor Value (Ref. 1, Table 5 12)	Rationale	References
ROS 118B, 203, 221, 222, 314B, 317A, 320A, 413, 602, 620, 701A, 701D, 701H, 702A, 702F, 703A, 703F, 704, 705, 707, 708, 709, 712, 713, 799, 801, 803, 806, 812, 901, 908, 914, 927	10	Evidence of subsurface intrusion with documented observed exposure	See AOE description above
All other structures in AOE	Greater than 0	Unknown containment features	Ref. 1, Section 5.2.1.1.2.1

AOE Hazardous Waste Quantity

Tier A – Hazardous Constituent Quantity:

The total hazardous constituent quantity for AOE 1 could not be adequately determined according to the HRS requirements; that is, the total mass of all Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) hazardous substances to have entered the structures is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1 and 5.2.1.2.2). Insufficient historical and current data (air concentration data, air flow data, etc.) are available to adequately calculate the total mass, or a partial estimate, of all CERCLA hazardous substances to have entered the structures. Therefore, there is insufficient information to calculate a total or partial hazardous constituent quantity estimate for AOE 1 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, Hazardous Wastestream Quantity (Ref. 1, Sections 2.4.2.1.1 and 5.2.1.2.2).

Hazardous Constituent Quantity Assigned Value: Not Scored
(Ref. 1, Table 5-19)

Tier B – Hazardous Wastestream Quantity:

The total hazardous wastestream quantity for AOE 1 could not be adequately determined according to the HRS requirements; that is, the total mass, or a partial estimate, of all hazardous wastestreams and CERCLA pollutants and contaminants to have entered the structures is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2 and 5.2.1.2.2). Insufficient historical and current data (air concentration data, air flow data, etc.) are available to adequately calculate the total mass, or a partial estimate, of all hazardous wastestreams and CERCLA pollutants and contaminants to have entered the structures. Therefore, there is insufficient information to adequately calculate or extrapolate a total or partial Hazardous Wastestream Quantity for AOE 1 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, Volume (Ref. 1, Sections 2.4.2.1.2 and 5.2.1.2.2).

Hazardous Wastestream Quantity Assigned Value: Not Scored
(Ref. 1, Table 5-19)

Tier C – Volume:

There are 102 residential and/or commercial structures or subunits within AOE-1 (Ref. 4, pp. 1-3; Figure 2 of this HRS documentation record). There are five multi-family residential subunits located above the ground floor (subunits of ROS 118, 202, and 808), which were not included in HRS calculations (for HRS purposes, in multi-story, multi-subunit, regularly occupied structures, only subunits on a level with observed exposure samples and levels below are considered to be within an AOE; also, for multi-subunit structures inferred to be in an AOE, only regularly occupied subunits on the lowest level of the structure are counted as part of the AOE. [Ref. 1, Section 5.2.0]). The area of each occupied residential and commercial structure, as a whole, is shown in square feet (ft^2) in the tax database (Ref. 4) and in records of conversations with property owners (Ref. 5; Ref. 56; Ref. 57). Since the height of each structure is unknown and not readily available, according to Section 5.2.1.2.2 of the HRS, a ceiling height of 8 feet was used to calculate volume. The product was divided by 27 to convert the volume to cubic yards (yd^3). Calculations for AOE 1 are as follows:

TABLE 10 – AOE 1, VOLUME

ROS ID	Area (ft^2)	Vol (ft^3)	Vol (yd^3)	References
118[1]	2766.3	22130.4	819.6444	Ref. 4, pp. 1-3, 5; Ref. 58, p. 2
201	2156	17248	638.8148	Ref. 4, pp. 1-3, 7
202[1]	1764.3	14114.4	522.7555	Ref. 4, pp. 1-3, 9; Ref. 58, p. 2
203	5578	44624	1652.7407	Ref. 4, pp. 1-3, 11
221	1500	12000	444.4444	Ref. 4, pp. 1-3, 23
222	1147	9176	339.8518	Ref. 4, pp. 1-3, 25
301	1740	13920	515.5555	Ref. 4, pp. 1-3, 27
314	1747	13976	517.6296	Ref. 4, pp. 1-3, 39
315	1853	14824	549.0370	Ref. 4, pp. 1-3, 41
316	1756	14048	520.2962	Ref. 4, pp. 1-3, 43
317	1715	13720	508.1481	Ref. 4, pp. 1-3, 45
318	1521	12168	450.6666	Ref. 4, pp. 1-3, 47
319	1602	12816	474.6666	Ref. 4, pp. 1-3, 49
320	1740	13920	515.5555	Ref. 4, pp. 1-3, 51
399	568	4544	168.2962	Ref. 4, pp. 1-3; Ref. 56, p. 1
413	1536	12288	455.1111	Ref. 4, pp. 1-3, 53
416	1740	13920	515.5555	Ref. 4, pp. 1-3, 55
417	1680	13440	497.7777	Ref. 4, pp. 1-3, 57
419	1646	13168	487.7037	Ref. 4, pp. 1-3, 59
501	4304	34432	1275.2592	Ref. 4, pp. 1-3, 61
602	2675	21400	792.5925	Ref. 4, pp. 1-3, 63
620	1444	11552	427.8518	Ref. 4, pp. 1-3, 65
701	9000	72000	2666.6666	Ref. 4, pp. 1-3, 67; Ref. 5, pp.1-3
702	7000	56000	2074.0740	Ref. 4, pp. 1-3, 67; Ref. 5, pp.1-3
703	6000	48000	1777.7777	Ref. 4, pp. 1-3, 67; Ref. 5, pp.1-3
704	2176	17408	644.7407	Ref. 4, pp. 1-3, 69
705	4977	39816	1474.6666	Ref. 4, pp. 1-3, 71
706	1704	13632	504.8888	Ref. 4, pp. 1-3, 73
707	2268	18144	672.0000	Ref. 4, pp. 1-3, 75
708	1500	12000	444.4444	Ref. 4, pp. 1-3, 77; Ref. 57, p. 1
709	2469	19752	731.5555	Ref. 4, pp. 1-3, 79
712	1324	10592	392.2962	Ref. 4, pp. 1-3, 83
713	976	7808	289.1851	Ref. 4, pp. 1-3, 85
715	1780	14240	527.4074	Ref. 4, pp. 1-3, 87
799	500	4000	148.1481	Ref. 4, pp. 1-3; Ref. 57, p. 1

TABLE 10 – AOE 1, VOLUME

805	2010	16080	595.5555	Ref. 4, pp. 1-3, 95
806	1513	12104	448.2962	Ref. 4, pp. 1-3, 97
807	1760	14080	521.4814	Ref. 4, pp. 1-3, 99
808[1]	1618.5	12948	479.5555	Ref. 4, pp. 1-3, 101; Ref. 58, p. 2
809	1760	14080	521.4814	Ref. 4, pp. 1-3, 103
810	2099	16792	621.9259	Ref. 4, pp. 1-3, 105
811	1680	13440	497.7777	Ref. 4, pp. 1-3, 107
812	2745	21960	813.3333	Ref. 4, pp. 1-3, 109
901	1716	13728	508.4444	Ref. 4, pp. 1-3, 111
902	2493	19944	738.6666	Ref. 4, pp. 1-3, 113
903	2312	18496	685.0370	Ref. 4, pp. 1-3, 115
904	2312	18496	685.0370	Ref. 4, pp. 1-3, 117
905	2312	18496	685.0370	Ref. 4, pp. 1-3, 119
906	1656	13248	490.6666	Ref. 4, pp. 1-3, 121
908	1019	8152	301.9259	Ref. 4, pp. 1-3, 123
909	1021	8168	302.5185	Ref. 4, pp. 1-3, 125
912	1669	13352	494.5185	Ref. 4, pp. 1-3, 127
914	751	6008	222.5185	Ref. 4, pp. 1-3, 129
927	3828	30624	1134.2222	Ref. 4, pp. 1-3, 131
TOTAL			**36,185.8046**	

[1] For scoring purposes, only ground-floor units are included in AOE 1 and given an ROS number.

Sum of values: 36,185.8046
Sum of values/2.5 (36,185.8046/2.5)
Equation for Assigning Value (Ref. 1, Table 5-19)
Volume Assigned Value: 14,474.3218

Tier D – Area:

Tier D Area was not calculated for AOE 1 since the volume was estimated. Therefore, according to HRS, the area is not calculated (Ref. 1, Section 2.4.2.1.3 and 2.4.2.1.4).

Area Assigned Value: 0

AOE Hazardous Waste Quantity Value:

Per the HRS, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), volume (Tier C), or area (Tier D) should be assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

TABLE 11 – AOE 1 HAZARDOUS WASTE QUANTITY

Tier Evaluated	Source 1 Values
A	Not Scored
B	Not Scored
C	14,474.3218
D	0

AOE 1 Hazardous Waste Quantity Value: 14,474.3218

5.2.1 SUBSURFACE INTRUSION COMPONENT

5.2.1.1 LIKELIHOOD OF EXPOSURE

5.2.1.1.1 Observed Exposure

Observed exposure to PCE was documented in Section 5.2.0 and the AOE 1 discussion of this HRS documentation record. AOE 1 was identified based on 33 structures or subunits which had observed exposure concentrations of PCE obtained through indoor air sampling (Figure 2 of this HRS documentation record).

Chemical Analysis

Of the 33 structures or subunits that had observed exposure concentrations of PCE, 23 regularly occupied residential or commercial structures or subunits had indoor air concentrations of PCE above the PCE cancer-risk benchmark. These structures are tabulated below.

TABLE 12 – OBSERVED EXPOSURE SAMPLES WITH LEVEL I CONCENTRATIONS

AOE Number	ROS ID	Lab Sample ID	Field Sample ID	Eligible Hazardous Substances	References
AOE 1	203[1]	L2371221-05	DOS-AA-ID-1-20231201-1	Tetrachloroethene	Ref. 4, pp. 1-3, 11; Ref. 15, pp. 110, 115, 516, 559; Ref. 22, p. 19; Ref. 47, pp. 8-9; Ref. 48, p. 6; Ref. 55, pp. 19-20
AOE 1	221	140-34215-16	ROS-221-41	Tetrachloroethene	Ref. 4, pp. 1-3, 23; Ref. 8, pp. 7, 23, 148-152, 2,410; Ref. 10, pp. 1-10
AOE 1	222	140-34216-18	ROS-222-41	Tetrachloroethene	Ref. 4, pp. 1-3, 25; Ref. 9, pp. 7, 25, 149-153, 1,404; Ref. 11, pp. 1-9
AOE 1	317A	140-34215-9	ROS-317A-41	Tetrachloroethene	Ref. 4, pp. 1-3, 45; Ref. 8, pp. 7, 16, 113-117, 2,409; Ref. 10, pp. 1-10
AOE 1	320A	L2370880-05	D9S-AA-ID-1-20231130-1	Tetrachloroethene	Ref. 4, pp. 1-3, 51; Ref. 12, pp. 8, 12, 780, 844; Ref. 19, p. 19; Ref. 55, pp. 19-20
AOE 1	602[1]	140-34216-11	ROS-602-41	Tetrachloroethene	Ref. 4, pp. 1-3, 63; Ref. 9, pp. 7, 18, 113-117, 1,403; Ref. 11, pp. 1-9
AOE 1	701A	140-34215-27	ROS-701A-41	Tetrachloroethene	Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 34, 214-218, 2,412; Ref. 10, pp. 1-10
AOE 1	701D	140-34215-18	ROS-701D-41	Tetrachloroethene	Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 25, 158-162, 2,411; Ref. 10, pp. 1-10
AOE 1	702A	140-34215-24	ROS-702A-41	Tetrachloroethene	Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 31, 199-203, 2,412; Ref. 10, pp. 1-10
AOE 1	703A	140-34215-29	ROS-703A-41	Tetrachloroethene	Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 36, 224-228, 2,412; Ref. 10, pp. 1-10
AOE 1	703F	140-34216-17	ROS-703F-41	Tetrachloroethene	Ref. 4, pp. 1-3, 67; Ref. 9, pp. 7, 24, 144-148, 1,404; Ref. 11, pp. 1-9
AOE 1	704[1]	L2371418-05	AS-AA-ID-2-20231201-1	Tetrachloroethene	Ref. 4, pp. 1-3, 69; Ref. 17, pp. 98, 102, 746, 811; Ref. 24, pp. 4, 21; Ref. 55, pp. 19-20
AOE 1	705[1]	L2371223-04	CCC-AA-ID-3-20231201-1	Tetrachloroethene	Ref. 4, pp. 1-3, 71; Ref. 16, pp. 98, 102, 1,658, 1,733; Ref. 25, p. 19; Ref. 55, pp. 19-20
AOE 1	707	L2371223-01	R-AA-ID-1-20231201-1	Tetrachloroethene	Ref. 4, pp. 1-3, 75; Ref. 16, pp. 98, 102, 1,648, 1,722; Ref. 21, pp. 1, 8, 9; Ref. 25, pp. 3, 8; Ref. 21, pp. 1, 8, 9; Ref. 55, pp. 19-20
AOE 1	708	L2371418-02	CWH-AA-ID-1-20231201-1	Tetrachloroethene	Ref. 4, pp. 1-3, 77; Ref. 17, pp. 98, 102, 734, 800; Ref. 24, p. 10; Ref. 55, pp. 19-20
AOE 1	709[1]	140-34215-23	ROS-709-42	Tetrachloroethene	Ref. 4, pp. 1-3, 79; Ref. 8, pp. 7, 30, 194-198, 2,411; Ref. 10, pp. 1-10
AOE 1	712	140-34215-21	ROS-712-41	Tetrachloroethene	Ref. 4, pp. 1-3, 83; Ref. 8, pp. 7, 28, 173-178, 2,411; Ref. 10, pp. 1-10
AOE 1	713	140-34215-20	ROS-713-41	Tetrachloroethene	Ref. 4, pp. 1-3, 85; Ref. 8, pp. 7, 27, 168-172, 2,411; Ref. 10, pp. 1-10
AOE 1	799	L2371418-03	COS-AA-ID-1-20231201-1	Tetrachloroethene	Ref. 4, pp. 1-3; Ref. 17, pp. 98, 102, 737, 803; Ref. 24, p. 13; Ref. 55, pp. 19-20
AOE 1	806[1]	L2371216-05	USB-AA-ID-2-20231201-1	Tetrachloroethene	Ref. 4, pp. 1-3, 97; Ref. 14, pp. 7, 11, 434, 483; Ref. 23, p. 19; Ref. 55, pp. 19-20
AOE 1	901	L2370885-05	RZA-AA-ID-1-20231130-1	Tetrachloroethene	Ref. 4, pp. 1-3, 111; Ref. 13, pp. 106, 111, 573, 621; Ref. 20, p. 23; Ref. 55, pp. 19-20
AOE 1	908	140-34215-13	ROS-908-41	Tetrachloroethene	Ref. 4, pp. 1-3, 123; Ref. 8, pp. 7, 20, 133-137, 2,410; Ref. 10, pp. 1-10
AOE 1	927[1]	L2370880-02	IPN-AA-ID-1-20231130-1	Tetrachloroethene	Ref. 4, pp. 1-3, 131; Ref. 12, pp. 8, 12, 771, 835; Ref. 19, p. 10; Ref. 55, pp. 19-20

[1]In structures where multiple or duplicate samples were collected, the sample with the highest result is displayed.

5.2.1.1.2 Potential for Exposure

Observed exposure was documented as stated above. Therefore, potential for exposure was not evaluated Ref. 1, Section 5.2.1.1.2).

5.2.1.1.3 Calculation of Likelihood of Exposure Factor Category Value

Potential for Exposure Factor Value (Ref. 1, Section 5.2.1.1.2.5): Not Evaluated
Likelihood of Exposure Factor Category Value: 550
(Ref. 1, Section 5.2.1.1.3)

5.2.1.2 WASTE CHARACTERISTICS

5.2.1.2.1 Toxicity/Degradation

The COC associated with the Site includes PCE, identified in AOE 1 and shown below.

Toxicity Factor Value

TABLE 13 – TOXICITY FACTOR VALUE

Eligible Hazardous Substance	AOE Number	Toxicity Factor Value	References
Tetrachloroethene	AOE 1	100	Ref. 2, p. 2

Degradation Factor Value

TABLE 14 – DEGRADATION FACTOR VALUE

Eligible Hazardous Substance	AOE Number	Substance Present in AOE or NAPL? (Y/N)	Depth to Contamination (Ref. 1, Section 5.2.1.1.2.2)	Half Life (Days)	Degradation Factor Value* (Ref. 1, Table 5 18)	References
Tetrachloroethene	AOE 1	Y	NA	154	1	Ref. 2, p. 2

*Any hazardous substance that meets the criteria for an observed exposure (those substances present in the AOE) have an assigned degradation factor value of 1 (Ref. 1, Section 5.2.1.2.1.2).

Toxicity/Degradation Factor Value

TABLE 15 – TOXICITY/DEGRADATION FACTOR VALUE

Eligible Hazardous Substance	AOE Number	Toxicity	Degradation Factor Value (Ref. 1, Table 5 18)	Toxicity/Degradation Factor Value
Tetrachloroethene	AOE 1	100	1	100

The substance with the highest combined toxicity/degradation factor value: Tetrachloroethene
Toxicity/Degradation Factor Value: 100

5.2.1.2.2 Hazardous Waste Quantity

TABLE 16 – HAZARDOUS WASTE QUANTITY

AOE Number/ASC Letter	AOE/ASC Hazardous Waste Quantity
AOE 1	14,474.3218
ASC	NS

Sum of AOE/ASC Values (rounded to the nearest integer) (Ref. 1, Section 2.4.2.2): 14,474
Hazardous Waste Quantity Factor Value based on estimates (Ref. 1, Table 2-6): 10,000
Hazardous Waste Quantity Factor Value: 10,000

5.2.1.2.3 Calculation of Waste Characteristics Factor Category Value

Toxicity/Degradation Factor Value: 100
Hazardous Waste Quantity Factor Value: 10,000
Toxicity Factor Value x Hazardous Waste Quantity Factor Value: 1,000,000 (1×10^6)
Waste Characteristics Factor Category Value: 32
(Ref. 1, Table 2-7)

5.2.1.3 TARGETS

There are 104 regularly occupied structures or subunits within AOE 1, including 16 occupied single-family residential structures, 70 occupied multi-family residential ground-floor subunits, 16 occupied commercial structures, and two occupied religious institutions (Figure 2 of this HRS documentation record). There are five multi-family residential subunits located above the ground-floor (subunits of ROS 118, 202, and 808), which were not included in HRS calculations.

TABLE 17 – TYPES OF STRUCTURES WITHIN AOE 1

AOE Number	Type of Structure	Number(s) of Specific Type of Structure	Type of Population	References
1	Single-Family Residential	16	Residents	Figure 2; Ref. 4
1	Multi-Family Residential	70[1,2]	Residents	Figure 2; Ref. 4; Ref. 5
1	Commercial	16[1]	Full-Time and Part-Time Workers	Figure 2; Ref. 4; Ref. 56; Ref. 57
1	Religious Institutions	2	NA	Figure 2; Ref. 4

[1] The number of regularly occupied subunits is included in place of the number of regularly occupied structures for multi-family residential and commercial structures.
[2] For scoring purposes, only ground-floor units are included in AOE 1 and given an ROS number.

TABLE 18 – HAZARDOUS SUBSTANCES THAT EXCEED HEALTH-BASED BENCHMARKS

AOE Number	ROS ID	Lab Sample ID	Field Sample ID	Eligible Hazardous Substance	Hazardous Substance Concentration (ug/m3)	Benchmark Concentration (ug/m3)	Benchmark (Ref. 1, Table 5 20)	References
AOE 1	203[1]	L2371221-05	DOS-AA-ID-1-20231201-1	Tetrachloroethene	189	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 11; Ref. 15, pp. 110, 115, 516, 559; Ref. 22, p. 19; Ref. 55, pp. 19-20
AOE 1	221	140-34215-16	ROS-221-41	Tetrachloroethene	75	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 23; Ref. 8, pp. 7, 23, 148-152, 2,410; Ref. 10, pp. 1-10
AOE 1	222	140-34216-18	ROS-222-41	Tetrachloroethene	13	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 25; Ref. 9, pp. 7, 25, 149-153, 1,404; Ref. 11, pp. 1-9
AOE 1	317A	140-34215-9	ROS-317A-41	Tetrachloroethene	24	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 45; Ref. 8, pp. 7, 16, 113-117, 2,409; Ref. 10, pp. 1-10
AOE 1	320A	L2370880-05	D9S-AA-ID-1-20231130-1	Tetrachloroethene	90.2	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 51; Ref. 12, pp. 8, 12, 780, 844; Ref. 19, p. 19; Ref. 55, pp. 19-20
AOE 1	602[1]	140-34216-11	ROS-602-41	Tetrachloroethene	26	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 63; Ref. 9, pp. 7, 18, 113-117, 1,403; Ref. 11, pp. 1-9
AOE 1	701A	140-34215-27	ROS-701A-41	Tetrachloroethene	14	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 34, 214-218, 2,412; Ref. 10, pp. 1-10
AOE 1	701D	140-34215-18	ROS-701D-41	Tetrachloroethene	37	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 25, 158-162, 2,411; Ref. 10, pp. 1-10
AOE 1	702A	140-34215-24	ROS-702A-41	Tetrachloroethene	51	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 31, 199-203, 2,412; Ref. 10, pp. 1-10
AOE 1	703A	140-34215-29	ROS-703A-41	Tetrachloroethene	110	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 67; Ref. 8, pp. 7, 36, 224-228, 2,412; Ref. 10, pp. 1-10
AOE 1	703F	140-34216-17	ROS-703F-41	Tetrachloroethene	13	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 67; Ref. 9, pp. 7, 24, 144-148, 1,404; Ref. 11, pp. 1-9
AOE 1	704[1]	L2371418-05	AS-AA-ID-2-20231201-1	Tetrachloroethene	1090	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 69; Ref. 17, pp. 98, 102, 746, 811; Ref. 24, pp. 4, 21; Ref. 55, pp. 19-20

TABLE 18 – HAZARDOUS SUBSTANCES THAT EXCEED HEALTH-BASED BENCHMARKS

AOE 1	705[1]	L2371223-04	CCC-AA-ID-3-20231201-1	Tetrachloroethene	319	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 71; Ref. 16, pp. 98, 102, 1,658, 1,733; Ref. 25, p. 19; Ref. 55, pp. 19-20
AOE 1	707	L2371223-01	R-AA-ID-1-20231201-1	Tetrachloroethene	3170 JK (317)*	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 75; Ref. 16, pp. 98, 102, 1,648, 1,722; Ref. 21, pp. 1, 8, 9; Ref. 25, pp. 3, 8; Ref. 55, pp. 19-20
AOE 1	708	L2371418-02	CWH-AA-ID-1-20231201-1	Tetrachloroethene	274	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 77; Ref. 17, pp. 98, 102, 734, 800; Ref. 24, p. 10; Ref. 55, pp. 19-20
AOE 1	709[1]	140-34215-23	ROS-709-42	Tetrachloroethene	210	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 79; Ref. 8, pp. 7, 30, 194-198, 2,411; Ref. 10, pp. 1-10
AOE 1	712	140-34215-21	ROS-712-41	Tetrachloroethene	49	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 83; Ref. 8, pp. 7, 28, 173-178, 2,411; Ref. 10, pp. 1-10
AOE 1	713	140-34215-20	ROS-713-41	Tetrachloroethene	12	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 85; Ref. 8, pp. 7, 27, 168-172, 2,411; Ref. 10, pp. 1-10
AOE 1	799	L2371418-03	COS-AA-ID-1-20231201-1	Tetrachloroethene	113	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3; Ref. 17, pp. 98, 102, 737, 803; Ref. 24, p. 13; Ref. 55, pp. 19-20
AOE 1	806[1]	L2371216-05	USB-AA-ID-2-20231201-1	Tetrachloroethene	82.7	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 97; Ref. 14, pp. 7, 11, 434, 483; Ref. 23, p. 19; Ref. 55, pp. 19-20
AOE 1	901	L2370885-05	RZA-AA-ID-1-20231130-1	Tetrachloroethene	36.1	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 111; Ref. 13, pp. 106, 111, 573, 621; Ref. 20, p. 23; Ref. 55, pp. 19-20
AOE 1	908	140-34215-13	ROS-908-41	Tetrachloroethene	17	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 123; Ref. 8, pp. 7, 20, 133-137, 2,410; Ref. 10, pp. 1-10
AOE 1	927[1]	L2370880-02	IPN-AA-ID-1-20231130-1	Tetrachloroethene	108	10.8	Cancer Risk	Ref. 2, p. 2; Ref. 4, pp. 1-3, 131; Ref. 12, pp. 8, 12, 771, 835; Ref. 19, p. 10; Ref. 55, pp. 19-20

µg/m^3 – Microgram per cubic meter
*JK – Result was qualified as estimated with an unknown bias; result was re-analyzed on dilution and is an approximate value; result was associated with a high laboratory control sample recovery (Ref. 25, pp. 3, 4). The concentration shown in parentheses is adjusted in accordance with the 2022 EPA fact sheet *Using Qualified Data to Document an Observed Release and Observed Contamination* (Ref. 21, pp. 1, 8, 9).

[1]In structures where multiple or duplicate samples were collected, the highest sample result is displayed.

5.2.1.3.1 Exposed Individual

There are 23 regularly occupied residential or commercial structures or subunits within AOE 1 that have concentrations of PCE above health-based benchmarks as shown on Table 18 above and displayed on Figure 2 of this HRS documentation record.

Exposed Individual Factor Value: 50
Ref. 1, Section 5.2.1.3.1

5.2.1.3.2 Population

For residential structures or subunits, the number of tenants is recorded where available from building surveys (Ref. 31). For the remaining residential structures or subunits, the actual population count was not readily available, therefore the persons per residence for the county in which the residence is located was used (Ref. 1, Section 5.2.1.3.2). Based on the United States Census Bureau, there are 2.37 persons per household in Bernalillo County, in which the city of Albuquerque is located (Ref. 18, p. 2). Population within an area of subsurface contamination is not considered for this scoring evaluation.

5.2.1.3.2.1 Level I Concentrations

Structures, and subunits within structures, with samples that meet observed exposure criteria by chemical analysis and meet or exceed a media-specific benchmark are assigned Level I concentrations (Ref. 1, Section 5.2.1.3.1). There are 23 residential or commercial structures or subunits in AOE 1 that are assigned Level I concentrations (Figure 2 of this HRS documentation record), as shown in Table 18 above. The Level I population is tabulated below.

Level I Population

TABLE 19 – LEVEL I POPULATION

AOE Number	ROS ID	Lab Sample ID	Field Sample ID	No. of Exposed Individuals (non workers)	Actual No. of Full time Workers (#)	Adjusted No. of Full Time Workers (#/3)	Actual No. of Part time Workers (#)	Adjusted No. of Part time Workers (#/6)	ROS's Total Population Value	References
AOE 1	203[1]	L2371221-05	DOS-AA-ID-1-20231201-1	NA	3	1.0000	8	1.3333	2.3333	Ref. 4, pp. 1-3, 11; Ref. 15, p. 110; Ref. 34, pp. 1-2; Ref. 55, pp. 19-20
AOE 1	221	140-34215-16	ROS-221-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 23; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 49
AOE 1	222	140-34216-18	ROS-222-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 25; Ref. 9, p. 7; Ref. 18, p. 2; Ref. 31, p. 55
AOE 1	317A	140-34215-9	ROS-317A-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 25; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 43
AOE 1	320A	L2370880-05	D9S-AA-ID-1-20231130-1	NA	2	0.6666	3	0.5000	1.1666	Ref. 4, pp. 1-3, 51; Ref. 12, p. 8; Ref. 34, pp. 1, 3; Ref. 55, pp. 19-20
AOE 1	602[1]	140-34216-11	ROS-602-41	3	NA	NA	NA	NA	3.0000	Ref. 4, pp. 1-3, 63; Ref. 9, p. 7; Ref. 18, p. 2; Ref. 31, p. 73
AOE 1	701A[3]	140-34215-27	ROS-701A-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 103
AOE 1	701D[3]	140-34215-18	ROS-701D-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 103
AOE 1	702A[4]	140-34215-24	ROS-702A-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 109

TABLE 19 – LEVEL I POPULATION

AOE 1	703A[5]	140-34215-29	ROS-703A-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 97
AOE 1	703F[5]	140-34216-17	ROS-703F-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 9, p. 7; Ref. 18, p. 2; Ref. 31, p. 97
AOE 1	704[1]	L23714 18-05	AS-AA-ID-2-20231201-1	NA	1	0.3333	3	0.5000	0.8333	Ref. 4, pp. 1-3, 69; Ref. 17, p. 98; Ref. 34, pp. 1, 4; Ref. 55, pp. 19-20
AOE 1	705[1]	L23712 23-04	CCC-AA-ID-3-20231201-1	NA	5	1.6666	20	3.3333	4.9999	Ref. 4, pp. 1-3, 71; Ref. 16, p. 98; Ref. 34, pp. 1, 5; Ref. 55, pp. 19-20
AOE 1	707	L23712 23-01	R-AA-ID-1-20231201-1	NA	6	2.0000	2	0.3333	2.3333	Ref. 4, pp. 1-3, 75; Ref. 16, p. 98; Ref. 34, pp. 1, 6; Ref. 55, pp. 19-20
AOE 1	708[2]	L23714 18-02	CWH-AA-ID-1-20231201-1	NA	0	0.0000	3	0.5	0.5000	Ref. 4, pp. 1-3, 77; Ref. 17, p. 98; Ref. 55, pp. 19-20; Ref. 57, p. 1
AOE 1	709[1]	140-34215-23	ROS-709-42	4	NA	NA	NA	NA	4.0000	Ref. 4, pp. 1-3, 79; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 67
AOE 1	712	140-34215-21	ROS-712-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 83; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 79
AOE 1	713	140-34215-20	ROS-713-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 85; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 85
AOE 1	799[2]	L23714 18-03	COS-AA-ID-1-20231201-1	NA	0	0.0000	0	0	0.0000	Ref. 4, pp. 1-3; Ref. 17, p. 98; Ref. 55, pp. 19-20; Ref. 57, p. 1
AOE 1	806[1]	L23712 16-05	USB-AA-ID-2-20231201-1	NA	0	0.0000	1	0.1666	0.1666	Ref. 4, pp. 1-3, 97; Ref. 14, p. 7; Ref. 34, pp. 1, 11; Ref. 55, pp. 19-20

TABLE 19 – LEVEL I POPULATION

AOE 1	901	L2370885-05	RZA-AA-ID-1-20231130-1	NA	3	1.0000	0	0	1.0000	Ref. 4, pp. 1-3, 111; Ref. 13, p. 106; Ref. 34, pp. 1, 12; Ref. 55, pp. 19-20
AOE 1	908	140-34215-13	ROS-908-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 123; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 7
AOE 1	927[1]	L2370880-02	IPN-AA-ID-1-20231130-1	NA	2	0.6666	0	0	0.6666	Ref. 4, pp. 1-3, 131; Ref. 12, p. 8; Ref. 34, pp. 1, 13; Ref. 55, pp. 19-20
TOTAL									**42.9996**	

[1]In structures where multiple or duplicate samples were collected, the sample with the highest result is displayed.
[2]Three part-time workers operate out of both ROS 708 and ROS 799. These workers are listed only once under ROS 708 for HRS calculations (Ref. 57, p. 1).
[3]For the ROS 701 structure, there are 18 total people. (Ref. 31, p. 103) Two people per subunit are apportioned to each of the nine subunits [A-I].
[4]For the ROS 702 structure, there are 14 total people. (Ref. 31, p. 109) Two people per subunit are apportioned to each of the seven subunits [A-G].
[5]For the ROS 703 structure, there are 12 total people. (Ref. 31, p. 97) Two people per subunit are apportioned to each of the six subunits [A-F].

Sum of regularly occupied structures’ total population values subject to Level I concentrations: 42.9996
Sum of regularly occupied structures’ total population values subject to Level I concentrations x 10: 429.996
Level I Concentrations Factor Value: 429.996

5.2.1.3.2.2 Level II Concentrations

Structures, and subunits within structures, with samples that meet observed exposure criteria by chemical analysis but do not equal or exceed a media-specific benchmark and structures inferred to be in an area of observed exposure based on samples meeting observed exposure criteria are assigned Level II concentrations (Ref. 1, Section 5.2.1.3.1). There are 79 structures or subunits in AOE 1 that are assigned Level II concentrations (Figure 2 of this HRS documentation record). The Level II population is tabulated below.

Level II Population

TABLE 20 – LEVEL II POPULATION

AOE Number	ROS ID	Lab Sample ID	Field Sample ID	No. of Exposed Individuals (non workers)	Actual No. of Full time Workers (#)	Adjusted No. of Full Time Workers (#/3)	Actual No. of Part time Workers (#)	Adjusted No. of Part time Workers (#/6)	ROS's Total Population Value	References
AOE 1	118A[1]	Inferred	NA	3	NA	NA	NA	NA	3.0000	Ref. 4, pp. 1-3, 5; Ref. 18, p. 2; Ref. 31, p. 61; Ref. 58, p. 1
AOE 1	118B[1]	140-34215-10	ROS-118B-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 5; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 61; Ref. 58, p. 1
AOE 1	201A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 7; Ref. 18, p. 2
AOE 1	201B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 7; Ref. 18, p. 2
AOE 1	201C	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 7; Ref. 18, p. 2
AOE 1	202A[1]	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 9; Ref. 18, p. 2; Ref. 58, p. 1
AOE 1	202B[1]	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 9; Ref. 18, p. 2; Ref. 58, p. 1
AOE 1	301A	Inferred	NA	NA	0	0.0000	3	0.5	0.5000	Ref. 4, pp. 1-3, 27; Ref. 34, pp. 1, 3
AOE 1	301B	Inferred	NA	NA	1	0.3333	3	0.5000	0.8333	Ref. 4, pp. 1-3, 27; Ref. 34, pp. 1, 3
AOE 1	314A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 39; Ref. 18, p. 2
AOE 1	314B	140-34216-15	ROS-314B-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 39; Ref. 9, p. 7; Ref. 18, p. 2; Ref. 31, p. 31
AOE 1	315A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 41; Ref. 18, p. 2

TABLE 20 – LEVEL II POPULATION

AOE 1	315B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 41; Ref. 18, p. 2
AOE 1	316A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 43; Ref. 18, p. 2
AOE 1	316B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 43; Ref. 18, p. 2
AOE 1	317B	Inferred	NA	5	NA	NA	NA	NA	5.0000	Ref. 4, pp. 1-3, 45; Ref. 18, p. 2; Ref. 31, p. 43
AOE 1	318A	Inferred	NA	NA	1	0.3333	2	0.3333	0.6666	Ref. 4, pp. 1-3, 47; Ref. 34, pp. 1, 3
AOE 1	318B	Inferred	NA	NA	0	0.0000	8	1.3333	1.3333	Ref. 4, pp. 1-3, 47; Ref. 34, pp. 1, 3
AOE 1	319A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 49; Ref. 18, p. 2
AOE 1	319B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 49; Ref. 18, p. 2
AOE 1	320B	Inferred	NA	NA	1	0.3333	0	0.0000	0.3333	Ref. 4, pp. 1-3, 51; Ref. 34, pp. 1, 3
AOE 1	399	Inferred	NA	NA	1	0.3333	3	0.5	0.8333	Ref. 4, pp. 1-3; Ref. 34, pp. 1, 3
AOE 1	413A	140-34216-16	ROS-413-41	1	NA	NA	NA	NA	1.0000	Ref. 4, pp. 1-3, 53; Ref. 9, p. 7; Ref. 18, p. 2; Ref. 31, p. 37
AOE 1	413B	Inferred	NA	0	NA	NA	NA	NA	0.0000	Ref. 4, pp. 1-3, 53; Ref. 9, p. 7; Ref. 18, p. 2; Ref. 31, p. 37
AOE 1	416A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 55; Ref. 18, p. 2
AOE 1	416B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 55; Ref. 18, p. 2
AOE 1	417A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 57; Ref. 18, p. 2
AOE 1	417B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 57; Ref. 18, p. 2
AOE 1	419A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 59; Ref. 18, p. 2
AOE 1	419B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 59; Ref. 18, p. 2
AOE 1	501A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 61; Ref. 18, p. 2

TABLE 20 – LEVEL II POPULATION

AOE 1	501B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 61; Ref. 18, p. 2
AOE 1	501C	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 61; Ref. 18, p. 2
AOE 1	501D	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 61; Ref. 18, p. 2
AOE 1	620	140-34216-3	ROS-620-41	1	NA	NA	NA	NA	1.0000	Ref. 4, pp. 1-3, 65; Ref. 9, p. 7; Ref. 18, p. 2; Ref. 31, p. 1
AOE 1	701B[3]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 103
AOE 1	701C[3]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 103
AOE 1	701E[3]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 103
AOE 1	701F[3]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 103
AOE 1	701G[3]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 103
AOE 1	701H[3]	140-34215-28	ROS-701H-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 103
AOE 1	701I[3]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 103
AOE 1	702B[4]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 109
AOE 1	702C[4]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 109
AOE 1	702D[4]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 109
AOE 1	702E[4]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 109
AOE 1	702F[2/4]	140-34215-25	ROS-702F-41	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 109
AOE 1	702G[4]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 109
AOE 1	703B[5]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 97

TABLE 20 – LEVEL II POPULATION

AOE 1	703C[5]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 97
AOE 1	703D[5]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 97
AOE 1	703E[5]	Inferred	NA	2	NA	NA	NA	NA	2.0000	Ref. 4, pp. 1-3, 67; Ref. 18, p. 2; Ref. 31, p. 97
AOE 1	706A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 73; Ref. 18, p. 2
AOE 1	706B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 73; Ref. 18, p. 2
AOE 1	715A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 87; Ref. 18, p. 2
AOE 1	715B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 87; Ref. 18, p. 2
AOE 1	805A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 95; Ref. 18, p. 2
AOE 1	805B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 95; Ref. 18, p. 2
AOE 1	805C	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 95; Ref. 18, p. 2
AOE 1	807A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 99; Ref. 18, p. 2
AOE 1	807B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 99; Ref. 18, p. 2
AOE 1	808A[1]	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 101; Ref. 18, p. 2; Ref. 58, p. 1
AOE 1	808B[1]	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 101; Ref. 18, p. 2; Ref. 58, p. 1
AOE 1	809A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 103; Ref. 18, p. 2
AOE 1	809B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 103; Ref. 18, p. 2
AOE 1	810	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 105; Ref. 18, p. 2
AOE 1	811A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 107; Ref. 18, p. 2
AOE 1	811B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 107; Ref. 18, p. 2

TABLE 20 – LEVEL II POPULATION

AOE 1	812[2]	140-34215-14	ROS-812-41	4	NA	NA	NA	NA	4.0000	Ref. 4, pp. 1-3, 109; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 91
AOE 1	902	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 113; Ref. 18, p. 2
AOE 1	903	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 115; Ref. 18, p. 2
AOE 1	904	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 117; Ref. 18, p. 2
AOE 1	905	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 119; Ref. 18, p. 2
AOE 1	906A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 121; Ref. 18, p. 2
AOE 1	906B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 121; Ref. 18, p. 2
AOE 1	909	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 125; Ref. 18, p. 2
AOE 1	912A	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 127; Ref. 18, p. 2
AOE 1	912B	Inferred	NA	2.37	NA	NA	NA	NA	2.3700	Ref. 4, pp. 1-3, 127; Ref. 18, p. 2
AOE 1	914	140-34215-12	ROS-914-41	3	NA	NA	NA	NA	3.0000	Ref. 4, pp. 1-3, 129; Ref. 8, p. 7; Ref. 18, p. 2; Ref. 31, p. 13
TOTAL									**170.8898**	

[1]For scoring purposes, only ground-floor units are included in AOE 1.
[2]In structures where multiple or duplicate samples were collected, the sample with the highest result is displayed.
[3]For the ROS 701 structure, there are 18 total people. (Ref. 31, p. 103) Two people per subunit are apportioned to each of the nine subunits [A-I].
[4]For the ROS 702 structure, there are 14 total people. (Ref. 31, p. 109) Two people per subunit are apportioned to each of the seven subunits [A-G].
[5]For the ROS 703 structure, there are 12 total people. (Ref. 31, p. 97) Two people per subunit are apportioned to each of the six subunits [A-F].

Sum of regularly occupied structures' total population values subject to Level II concentrations: 170.8898
Level II Concentrations Factor Value: 170.8898

5.2.1.3.2.3 Population within Area(s) of Subsurface Contamination

Population within an area of subsurface contamination (ASC) is not evaluated for this Site.

Population within an Area of Subsurface Contamination Factor Value: Not Scored

5.2.1.3.2.4 Calculation of Population Factor Value

The population factor value is the sum of the factor values for Level I concentrations, Level II concentrations, and population within the ASCs (Ref. 1, Section 5.2.1.3.2.4).

Level I Concentrations Factor Value: 429.996
Level II Concentrations Factor Value: 170.8898
Population within an Area of Subsurface Contamination Factor Value: Not Scored
Level I Concentrations + Level II Concentrations + Population within an Area of Subsurface Contamination: 600.8858
Population Factor Value: 600.8858

5.2.1.3.3 Resources

Description of Resources:

There are two regularly occupied resource structures, including Life Tabernacle United Pentecostal Church (ROS 801) and Carlisle Community Baptist Church (ROS 803), located within AOE 1 (Ref. 4, pp. 1-3, 89, 93; Figure 2 of this HRS documentation record).

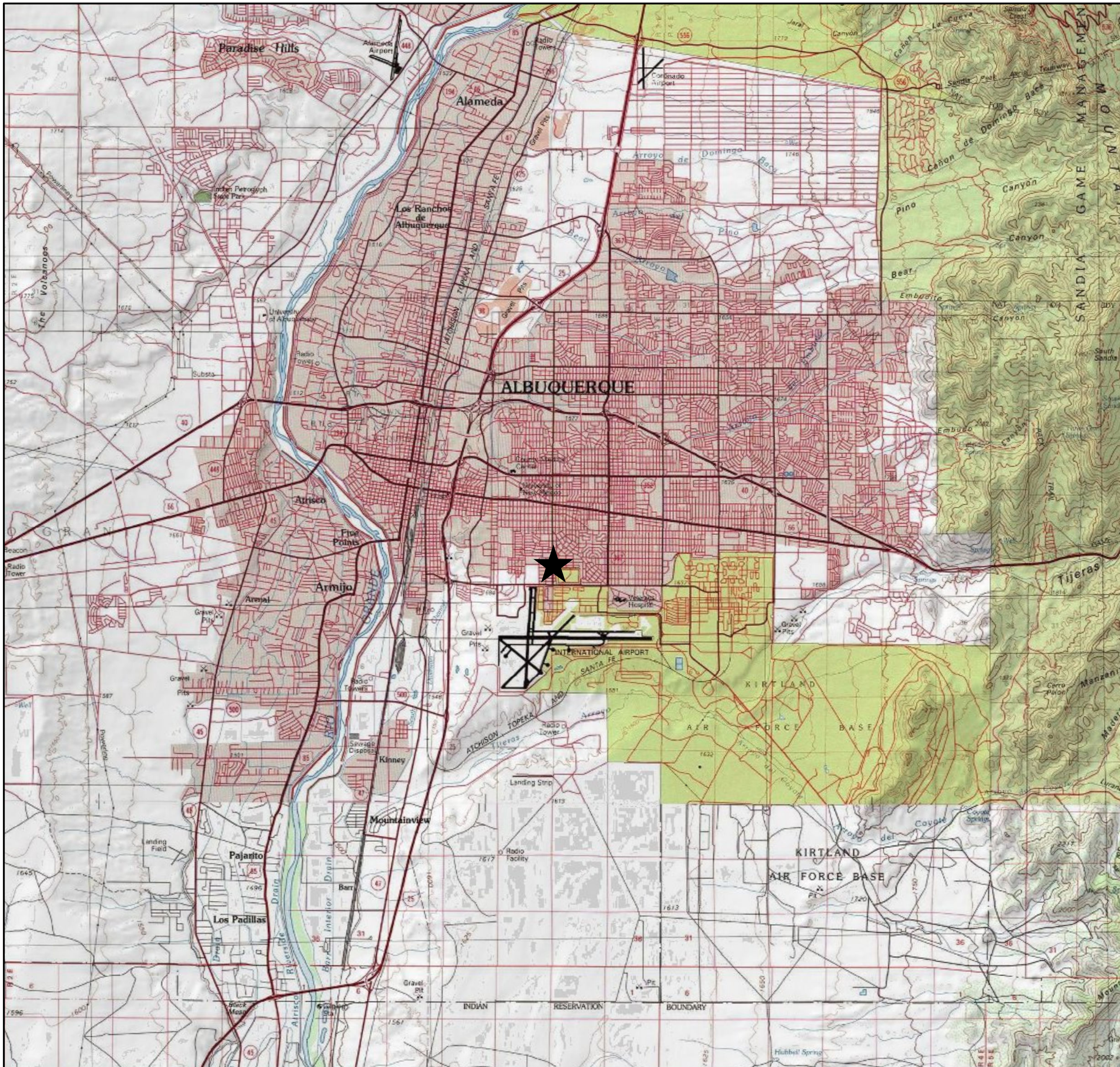
Resources Factor Value: 5

5.2.1.3.4 Calculation of Targets Factor Category Value

The sum of the values for the exposed individual, population, and resources factors is assigned as the targets factor category value for the subsurface intrusion component (Ref. 1, Section 5.2.1.3.4).

Exposed Individual Factor Value: 50
Population Factor Value: 600.8858
Resources Factor Value: 5
Exposed Individual + Population + Resources: 655.8858
Targets Factor Category Value: 655.8858

Attachment A – Figures



THE SOURCE OF THIS MAP IMAGE IS ESRI, USED BY THE EPA WITH ESRI'S PERMISSION.

LEGEND

★ Site Coordinates

0 1 2 4
Miles

N

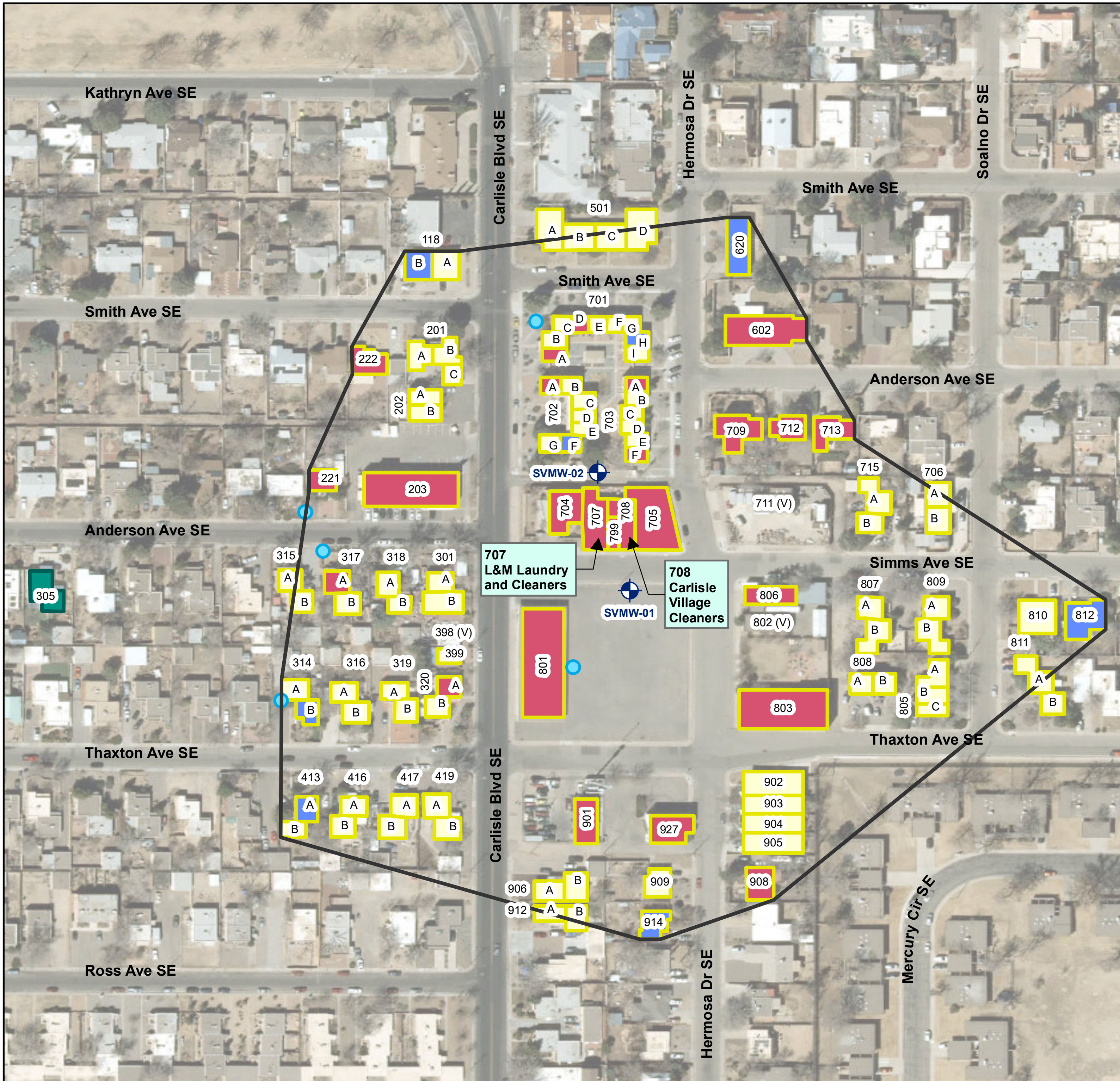
DISCLAIMER: THIS FIGURE HAS BEEN PREPARED FOR REFERENCE PURPOSES ONLY. THIS FIGURE SHOULD NOT BE USED FOR SURVEY OR ENGINEERING PURPOSES.

U.S. EPA REGION 6

FIGURE 1.
SITE LOCATION MAP

CARLISLE VILLAGE CLEANERS
ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO

DATE	EPA ID NO.	SCALE
JULY 2024	NMN000622185	AS SHOWN



THE SOURCE OF THIS MAP IMAGE IS ESRI, USED BY THE EPA WITH ESRI'S PERMISSION.

LEGEND

- AOE Boundary
- Approximate Footprint of Inferred AOE Structure
- Level I Sample Location
- Level II Sample Location
- Background Location
- Ambient Air Sample Location
- Soil Vapor Monitor Well
- 101 Regularly Occupied Structure ID
- (V) Vacant Structure

0 75 150 300
Feet
N

DISCLAIMER: THIS FIGURE HAS BEEN PREPARED FOR REFERENCE PURPOSES ONLY. THIS FIGURE SHOULD NOT BE USED FOR SURVEY OR ENGINEERING PURPOSES.

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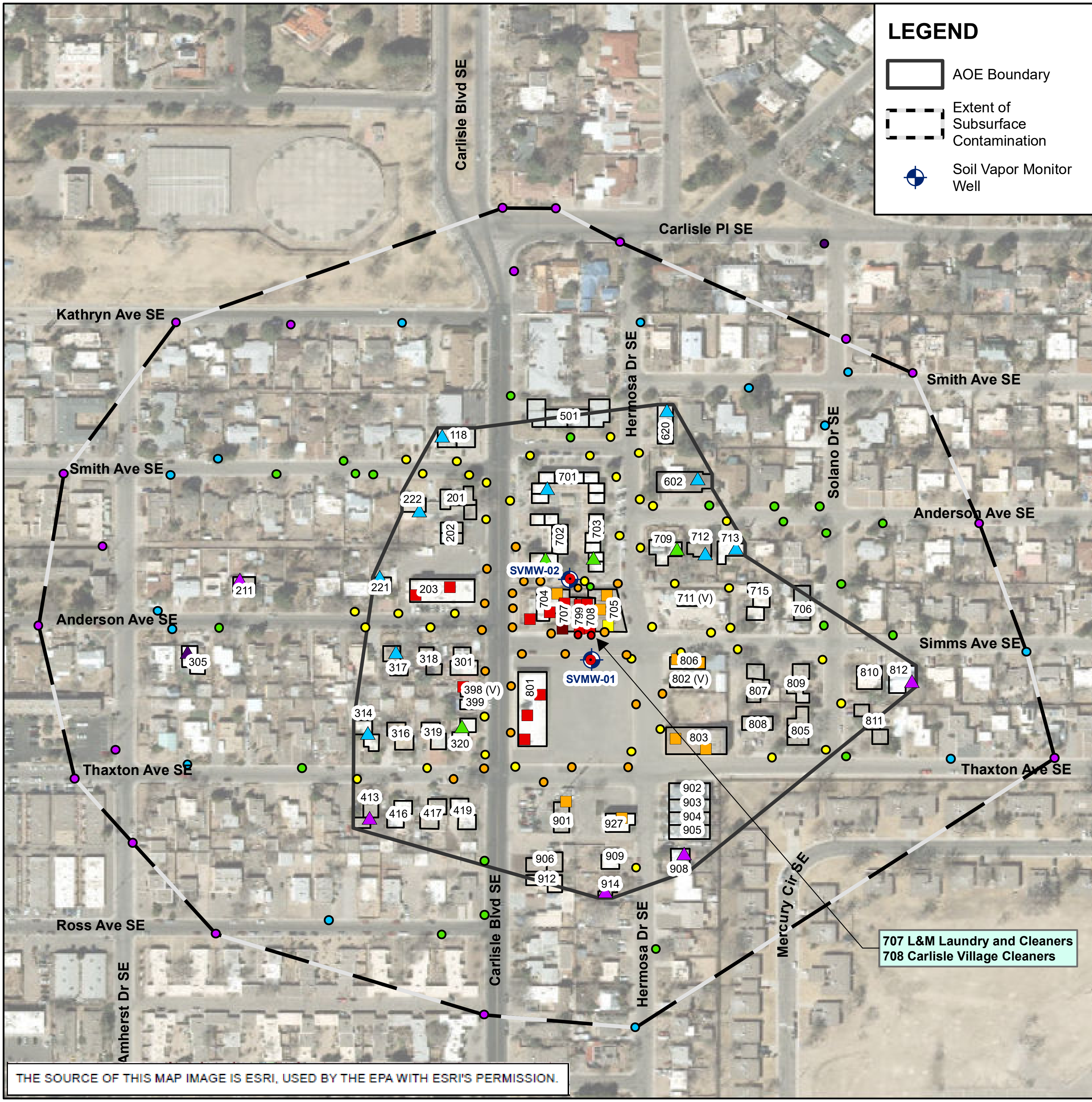
FIGURE 2. AREA OF OBSERVED EXPOSURE (AOE) LOCATION MAP

CARLISLE VILLAGE CLEANERS
ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO

DATE	EPA ID NO.	SCALE
JULY 2024	NMN000622185	AS SHOWN



Active Soil Gas Sample (Shallow), PCE Conc.

- ≥ 100,000 µg/m3

Crawl Space Sample, PCE Conc.

- Not Detected
- ≥ 10 µg/m3
- ≥ 1 µg/m3
- ≥ 100 µg/m3

Passive Soil Gas Sample, PCE Conc.

- Not Detected
- ≥ 1,000 µg/m3
- ≥ 1 µg/m3
- ≥ 10,000 µg/m3
- ≥ 10 µg/m3
- ≥ 100,000 µg/m3
- ≥ 100 µg/m3

Sub-Slab Sample, PCE Conc.

- ≥ 1,000 µg/m3
- ≥ 10,000 µg/m3
- ≥ 100,000 µg/m3
- ≥ 1,000,000 µg/m3

101 Regularly Occupied Structure ID

(V) Vacant Structure

0 100 200 400 Feet

N

DISCLAIMER: THIS FIGURE HAS BEEN PREPARED FOR REFERENCE PURPOSES ONLY. THIS FIGURE SHOULD NOT BE USED FOR SURVEY OR ENGINEERING PURPOSES.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

U.S. EPA REGION 6

FIGURE 3. EXTENT OF SUBSURFACE CONTAMINATION MAP

CARLISLE VILLAGE CLEANERS
ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO

DATE	EPA ID NO.	SCALE
JULY 2024	NMN000622185	AS SHOWN

Figure References

Figure 1:

Base Map Source* ESRI, ESRI contributors, and the GIS User Community

*Map annotated by EPA in March 2024 to depict Site location (Ref. 64).

Figure 2:

Base Map Source* ESRI, ESRI contributors, and the GIS User Community

*Map annotated by EPA in March 2024 to depict ROS locations, sample locations, and approximate AOE boundary (Ref. 4; Ref. 6, pp. 6, 13, 16, 25; Ref. 8, pp. 7-37; Ref. 9, pp. 7-31; Ref. 12, pp. 826-844; Ref. 13, pp. 2-25; Ref. 14, pp. 465-483; Ref. 15, pp. 2-20; Ref. 16, pp. 2-21; Ref. 17, pp. 2-22; Ref. 33, p. 35; Ref. 39, p. 40).

Figure 3:

Base Map Source* ESRI, ESRI contributors, and the GIS User Community

*Map annotated by EPA July 2024 to depict ROS locations, sample locations, and approximate extent of subsurface contamination (Ref. 4; Ref. 8; Ref. 9; Ref. 12, p. 841; Ref. 33, p. 40; Ref. 43, pp. 13-17, 30-73; Ref. 44, pp. 8-23; Ref. 45, pp. 10-13, 16-43; Ref. 47; Ref. 49, pp. 8-30; Ref. 67, pp. 2-26; Ref. 68, pp. 2-21).