HAZARD RANKING SYSTEM (HRS) DOCUMENTATION RECORD
REVIEW COVER SHEET

Name of Site: EXIDE TECHNOLOGIES - VERNON

Contact Person: Matt Mitguard, EPA Region 9 (415) 972-3096

Leslie Ramirez, EPA Region 9 (415) 972-3978

Documentation Record: Alex Grubb, Weston Solutions, Inc.
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Pathways, Components, or Threats Not Scored

HRS Scoring for the former Exide Technologies – Vernon facility was limited to the groundwater migration pathway and was sufficient to qualify for the NPL solely based on the groundwater migration pathway score.

The soil exposure and subsurface intrusion, surface water, and air pathways were evaluated as part of the Site Inspection (SI), there was not sufficient data or documentation to significantly impact the HRS Score based on the following factors:

Soil Exposure Component of the Soil Exposure and Subsurface Intrusion Pathway: Historical operations at the former Exide-Vernon facility may have resulted in lead and other heavy metals being emitted and deposited to the ground and on other surfaces around the facility and in surrounding areas (Ref. 7, p.52). The facility is currently undergoing closure activities, is surrounded by a fence, and is entirely paved, preventing any residual on-site soil contamination from being released into the environment, and there is no public recreation use (Ref. 7, p.52). While there is an estimated population of 6,055 within one mile of the Exide-Vernon facility, there are no residents within 0.5 miles of the facility (Ref. 7, p.52). Based on the results of the background soil sampling conducted during the SI, only 15 residential properties were found to have lead concentrations greater than three times the background level, for a total resident population of 44.7 (Ref. 7, p.53). The facility is located within a large industrial area with numerous nearby potential sources, and there is no conclusive evidence that the facility is the sole source of lead contamination in the residential area (Ref. 7, p.76).

Surface Water Migration Pathway: The nearest major surface water body is the Los Angeles River, approximately 0.15-miles southwest of the former Exide Technologies – Vernon facility (Ref. 7, p. 53, 61). On-site surface water runoff is collected in a retention basin and directed to an on-site wastewater treatment plant (Ref. 7, p.97).

Subsurface Intrusion Component of the Soil Exposure and Subsurface Intrusion Pathway: Based on previous soil vapor monitoring conducted at the Exide-Vernon facility, volatized TCE was present in the subsurface soil, however, structures at the facility have not been occupied since 2014 and are currently being deconstructed (Ref. 7, p.53). Indoor air samples were collected from both the engineering building and employee facilities buildings showed that TCE was detected at concentrations below the commercial indoor air screening level (Ref. 7, p.23)

Air Migration Pathway: Historical operations at the former Exide-Vernon facility resulted in lead and other heavy metals being emitted and deposited to the ground and other surfaces at the facility and in the surrounding areas, however, based on air modeling conducted at the site there is no conclusive evidence that the facility is the sole source of lead contamination in the residential area (Ref. 7, p. 54). The facility has not been in operation since 2014 (Ref. 7, p.54).

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Figures

HRS DOCUMENTATION RECORD

Name of Site: EXIDE TECHNOLOGIES - VERNON

EPA ID#: CAD097854541

EPA Region: 9

Date Prepared: September 2024

Street Address of Site: 2700 S. Indiana Street

City, County and State: Vernon, Los Angeles County, California 90058

Topographic Map: Downey, CA USGS 7.5-Minute Quadrangle (Ref. 3)

Latitude: 34.005229° North Longitude: -118.193402° West (Ref. 3, p.1; Ref. 64, p. 2)

Latitude/Longitude Reference Point: The latitude and longitude correspond to geographic center point of the facility (Ref. 64, p. 2).

SCORES		
Air Pathway	=	Not scored
Ground Water[1] Pathway	=	95.56
Soil Exposure and Subsurface Intrusion Pathway	=	Not scored
Surface Water Pathway	=	Not Scored
HRS SITE SCORE	**=**	47.78

The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area where the site is located. They represent one or more locations the United States Environmental Protection Agency (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 the Comprehensive Environmental Response, Compensation & Liability Act (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.

[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.

HAZARD RANKING SYSTEM SUMMARY SCORESHEETS

SITE NAME: EXIDE TECHNOLOGIES - VERNON

CITY/COUNTY/STATE: Vernon, Los Angeles County, California 90058

EPA ID #: CAD097854541

EVALUATOR: Alex Grubb **DATE:** September 5, 2024

LATITUDE: 34.005229° N **LONGITUDE:** -118.193402° W

	S	S^2
Ground Water Migration Pathway Score (S_{gw})	95.56	9,131.71
Surface Water Migration Pathway Score (S_{sw})	Not scored	Not scored
Soil Exposure and Subsurface Intrusion Pathway Score (S_{sessi})	Not scored	Not scored
Air Migration Pathway Score (S_a)	Not scored	Not scored
$S_{gw}^2 + S_{sw}^2 + S_{sessi}^2 + S_a^2$	XXXXXXX	9,131.71
$(S_{gw}^2 + S_{sw}^2 + S_{sessi}^2 + S_a^2) / 4$	XXXXXXX	2,282.92
SQRT $((S_{gw}^2 + S_{sw}^2 + S_{sessi}^2 + S_a^2) / 4)$	XXXXXXX	47.78

HRS TABLE 3-1
Ground Water Migration Component Scoresheet

Factor Categories and Factors	Maximum Value	Value Assigned
Aquifer Evaluated: Exposition through Jefferson		
Likelihood of Release to an Aquifer:		
1. Observed Release	550	550
2. Potential to Release		
2a. Containment	10	Not Scored
2b. Net Precipitation	10	Not Scored
2c. Depth to Aquifer	5	Not Scored
2d. Travel Time	35	Not Scored
2e. Potential to Release [lines 2a(2b + 2c + 2d)]	500	Not Scored
3. Likelihood of Release (higher of lines 1 and 2e)	550	550
Waste Characteristics:		
4. Toxicity/Mobility	(a)	1,000
5. Hazardous Waste Quantity	(a)	10
6. Waste Characteristics	100	10
Targets:		
7. Nearest Well	(b)	5
8. Population:		
8a. Level I Concentrations	(b)	0
8b. Level II Concentrations	(b)	0
8c. Potential Contamination	(b)	1,423.40
8d. Population (lines 8a + 8b + 8c)	(b)	1,423.40
9. Resources	5	0
10. Wellhead Protection Area	20	5
11. Targets (lines 7 + 8d + 9 + 10)	(b)	1,433.40
Ground Water Migration Score for an Aquifer:		
12. Aquifer Score [(lines 3 x 6 x 11)/82,500][C]	100	95.56
Ground Water Migration Pathway Score:		
13. Pathway Score (S_{gw}), (highest value from line 12 for all aquifers evaluated)[C]	100	95.56

(a) Maximum value applies to waste characteristics category.
(b) Maximum value not applicable.
(c) Do not round to nearest integer.

REFERENCES

Reference Number	Description of the Reference
1	U.S. Environmental Protection Agency (EPA). Hazard Ranking System (HRS), Title 40 Code of Federal Regulations (CFR) Part 300, Appendix A (55 Federal Register [FR] 51583, December 14,1990, as amended at 82 FR 2779, Jan. 9, 2017; 83 FR 38037, Aug. 3, 2018), as published in the CFR on July 1, 2019, with two attachments—Attachment A: FR Vol. 55, No. 241. December 14, 1990.HRS Preamble. Attachment B: FR Vol. 82, No. 5, January 9, 2017. Addition of a Subsurface Intrusion Component to the Hazard Ranking System Preamble. 105 Pages. Available on-line at: https://semspub.epa.gov/work/HQ/174028.pdf and https://www.regulations.gov/document?D=EPA-HQ-SFUND-2010-1086-0104.
2	EPA, Superfund Chemical Data Matrix (SCDM) Query, Accessed March 2024, 13 pages. Available online at: http://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm.
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4	Weston Solutions, Inc. (WESTON), Preliminary Assessment Report, Exide Technologies, November 2022, 56 pages.
5	URS, Removal Action Plan (Cleanup Plan), Offsite Properties Within The Exide Preliminary Investigation Area, July 2017, 164 pages.
6	California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), Imminent and Substantial Endangerment Determination, Docket No. HAS-FY 20/21-003, October 12, 2020, 18 pages.
7	WESTON, Site Inspection Report, Exide Technologies - Vernon, June 2024, 111 pages.
8	GNB Incorporated (GNB), RCRA Facility Assessment. October 1990, 125 pages.
9	Advanced GeoServices (AGS), Phase 2 RCRA Facility Investigation, October 13, 2006, 155 pages.
10	AGS and Avocet Environmental, Inc., Comprehensive RCRA Facility Investigation Report – Part 1 (On-Site Soil and Soil Gas), Exide Technologies, February 2016, 360 pages.
11	AGS and Avocet Environmental, Inc., Comprehensive RCRA Facility Investigation Report – Part 2 (Groundwater), Exide Technologies, May 2016, 499 pages.
12	AGS and Avocet Environmental, Inc., Interim Corrective Measures Pilot Study Work Plan – SWMU-11, Exide Technologies, August 2016, 50 pages.
13	California Environmental Protection Agency (CalEPA), Request for US EPA to List Exide Facility and Surrounding Industrial and Residential Areas Contaminated by Past Facility Operations on Superfund's National Priorities List, July 2022, 2 pages.

Reference Number	Description of the Reference
14	WESTON, Draft Final Site Inspection Report, Exide Technologies - Vernon, July 2024, Attachment 6 Field Sampling Sheets, 8 pages.
15	Geotracker, https://geotracker.waterboards.ca.gov/, data extracted 2024, 1 page.
16	DTSC, Final Environmental Impact Report, Volume 1, July 2017, 56 pages.
17	Eurofins Calscience, Analytical Report, 440-257660-1, December 18, 2023, 2,062 pages.
18	WESTON-START, Data Validation Report, Exide Technologies – EPA Groundwater, 440-257660-1, January 13, 2024, 21 pages.
19	Geosyntec, Fourth Quarter and Annual 2019 Groundwater Monitoring Report and Geosyntec Responses to DTSC Review Comments on Exide's February 17, 2019 Fourth Quarter And Annual Groundwater Monitoring Report, Former Exide Vernon Facility, May 2020, 1,255 pages.
20	Eurofins Calscience, Analytical Report, 440-289484-1, December 2023, 1,726 pages.
21	WESTON-START, Data Validation Report, Exide Technologies – EPA Groundwater, 440-289484-1, January 19, 2024, 20 pages.
22	Dudek, 2021 Groundwater Monitoring Report, Exide Technologies Former Vernon Facility, November 2021, 411 pages
23	Eurofins Calscience, Analytical Report, 570-158339-1, 2023, 2,923 pages.
24	WESTON-START, Data Validation Report, Exide Technologies – EPA Groundwater, 570-158339-1, December 1, 2023, 35 pages.
25	Eurofins Calscience, Analytical Report, 440-289412-1, 2023, 1,722 pages.
26	WESTON-START, Data Validation Report, Exide Technologies – EPA Groundwater, 440-289412-1, January 17, 2024, 16 pages.
27	Department of Water Resources, State of California; Bulletin No. 104, Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County, Appendix A, Ground Water Geology; June 1961, 462 pages
28	State of California; California's Groundwater Bulletin 118, Coastal Plain of Los Angeles Groundwater Basin, Central Subbasin; February 27, 2004, 5 pages.
29	American Water Works Association Research Foundation, Contaminant Transport Through Aquitards: Technical Guidance for Aquitard Assessment, 2006, 18 pages.
30	Department of Water Resources, State of California; Watermaster Service in the Central Basin, Los Angeles County, July 1, 2012 – June 30, 2013; October 2013, 12 pages.
31	Johnson, R.L., Clark, B.R., Landon, M.K., Kauffman, L.J., Eberts, S.M., Journal of the American Water Resources Association, Modeling the Potential Impact of Seasonal and Inactive Multi-Aquifer Wells on Contaminant Movement to Public Water-Supply Wells, June 2011, 9 pages.
32	Water Replenishment District of Southern California (WRD) Engineering Survey and Report, June 6, 2023, 86 pages.

Reference Number	Description of the Reference
33	WRD Well Construction Reports, Well 10-03, Well 22-01, Well 39-02, Well 62-01, Well 62-02, Well 04, Gage Well 02, Watson Well 01, Converse Well 01, Well G0004, Well NA003, Well 07, Well 28, Well 14, Well 10, Well 11, Well 12; https://gis.wrd.org/; data extracted May 2024, 17 pages.
34	California Drinking Water Watch Water System Details, California Water Service – ELA; Commerce-City Water Department; GSWC – Bell, Bell Gardens; GSWC – Florence/Graham; Maywood Mutual Water Company #3; South Gate-City Water Department; Vernon-City Water Department; Walnut Park Mutual Water Company; City of Bell Gardens; Huntington Park-City Water Department; Maywood Mutual Water Company #1; Maywood Mutual Water Company #2; Tract 180 Mutual Water Company; Tract 349 Mutual Water Company; https://sdwis.waterboards.ca.gov/PDWW; data extracted May 2024, 18 pages.
35	Well Reports, California Water Service – ELA Well 10-03, Well 22-01, Well 39-02, Well 62-01, Well 62-02; Commerce-City Water Department Well 04L; GSWC – Bell, Bell Gardens Gage Well 02, Watson Well 01; GSWC – Florence/Graham Converse Well 01, Goodyear Well 04, Nadeau Well 03; Maywood Mutual Water Company #3 Well 07; South Gate-City Water Department Well 28; Vernon-City Water Department Well 14; Walnut Park Mutual Water Company Well 10, Well 11, Well 12; https://geotracker.waterboards.ca.gov; data extracted May 2024, 47 pages.
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37	E2 Environmental Inc., Quarterly Ground Water Monitoring Report, Third Quarter 2015, December 4, 2015, 156 pages.
38	E2 Environmental Inc., Quarterly Ground Water Monitoring Report, Fourth Quarter and Annual 2015, February 29, 2016, 1,387 pages.
39	E2 Environmental Inc., Ground Water Monitoring Report, First Quarter 2016, May 31, 2016, 101 pages.
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50	Dudek, Fourth Quarter and Annual 2018 Groundwater Monitoring Report, August 30, 2019, 631 pages.
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52	Dudek, Second Quarter 2019 Groundwater Monitoring Report, August 12, 2019, 486 pages.
53	Geosyntec, Third Quarter 2019 Groundwater Monitoring Report with Responses to DTSC Comments, January 6, 2020, 572 pages.
54	Northgate Environmental Management Inc., Draft 2021 Annual Groundwater Monitoring Report, Former Honeywell International Inc., April 14, 2022, 168 pages.
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58	Golden State Water Company, 2020 Urban Water Management Plan, Bell-Bell Gardens Service Area, June 2021, 90 pages.
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60	Maywood Mutual Water Company Number 3, 2021 Consumer Confidence Report; March 4, 2022, 8 pages.
61	City of South Gate, 2020 Urban Water Management Plan, June 2021, 689 pages.
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65	Woodward-Clyde Consultants, Phase I Site Assessment, June 9, 1986, 29 Pages.
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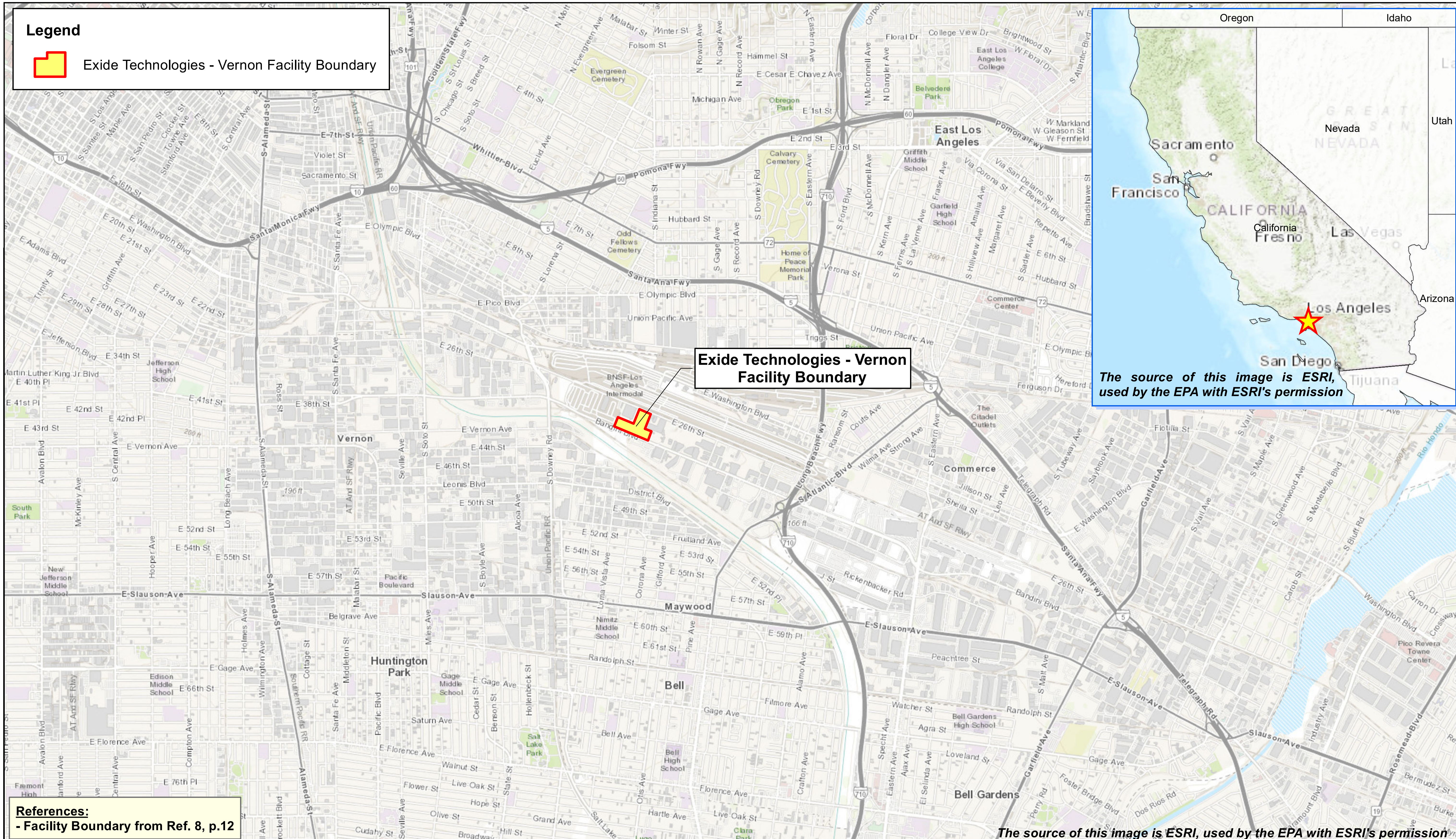
68	WRD Water Production Reports, Well 10-03, Well 22-01, Well 39-02, Well 62-01, Well 62-02, Well 04, Gage Well 02, Watson Well 01, Converse Well 01, Well G0004, Well NA0003, Well 07, Well 28, Well 14, Well 10, Well 11, Well 12; https://gis.wrd.org/; data extracted June 26, 2024, 34 pages.
69	WRD Water Rights Calculator, California Water Service – ELA; Commerce-City Water Department; GSWC – Bell, Bell Gardens; GSWC – Florence/Graham; Maywood Mutual Water Company #3; South Gate-City Water Department; Vernon-City Water Department; Walnut Park Mutual Water Company, https://rights.wrd.orhg; data extracted June 27, 2024, 38 pages.
70	Los Angeles County, Groundwater Protection Areas, January 2020, 1 page.
71	AGS, Comprehensive On-Site RCRA Facility Investigation Report – Part 1 (On-Site Soil and Soil Gas) Excerpt, Appendix F-1A Data Validation Reports, 2016, 1073 pages.
72	AGS, Comprehensive On-Site RCRA Facility Investigation Report – Part 1 (On-Site Soil and Soil Gas) Excerpt, Appendix F-3 Data Validation Reports, 2016, 2432 pages.
73	AGS, Comprehensive On-Site RCRA Facility Investigation Report – Part 1 (On-Site Soil and Soil Gas) Excerpt, Appendix F-6 Data Validation Reports, February 2016, 2454 pages.
74	WESTON, Figure B-1, 2021 Groundwater TCE Concentrations, Exide Technologies – Vernon, August 2024, 1 page.

ACRONYM LIST

µg/l	micrograms per liter
µg/kg	micrograms per kilogram
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
CWD	City Water Department
CWSC	The California Water Services Company
DTSC	Department of Toxic Substances Control
ELA	East Los Angeles
EPA	United States Environmental Protection Agency
Exide	Exide Technologies, Inc.
Exide-Vernon	Exide Technologies – Vernon Facility
ft^2	square feet
ft amsl	feet above mean sea level
ft bgs	feet below ground surface
GSWC	Golden State Water Company
HRS	Hazard Ranking System
MCL	Maximum Contaminant Limit
MWC	Mutual Water Company
MWD	Metropolitan Water District
mg/kg	milligrams per kilogram
ND	Not Detected
NE	Not Evaluated
NPL	National Priorities List
NS	Not Scored
PRP	Potentially Responsible Party
QL	Quantitation Limit
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
SAP	Sampling and Analysis Plan
SCDM	Superfund Chemical Data Matrix
SCWC	Southern California Water Company
SI	Site Inspection
Site	Exide Technologies - Vernon
SQL	Sample Quantitation Limit
SWMU	Solid Waste Management Unit
TCE	Trichloroethylene
TDL	Target Distance Limit
USGS	United States Geological Survey
VOC	Volatile Organic Compounds
WESTON	Weston Solutions, Inc.
WPMWC	Walnut Park Mutual Water Company

NOTES TO THE READER

Page numbers have been added to the references in the lower right corner. For reference citations, please refer to the page numbers in this location.



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Pacific Southwest

FIGURE A-1
SITE LOCATION MAP
EXIDE TECHNOLOGIES - VERNON HRS DOCUMENTATION RECORD
VERNON, LOS ANGELES COUNTY, CA

0 — 500
Feet

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FIGURE A-2
SITE LAYOUT
EXIDE TECHNOLOGIES HRS - VERNON DOCUMENTATION RECORD
VERNON, LOS ANGELES COUNTY, CA

0 200
Feet

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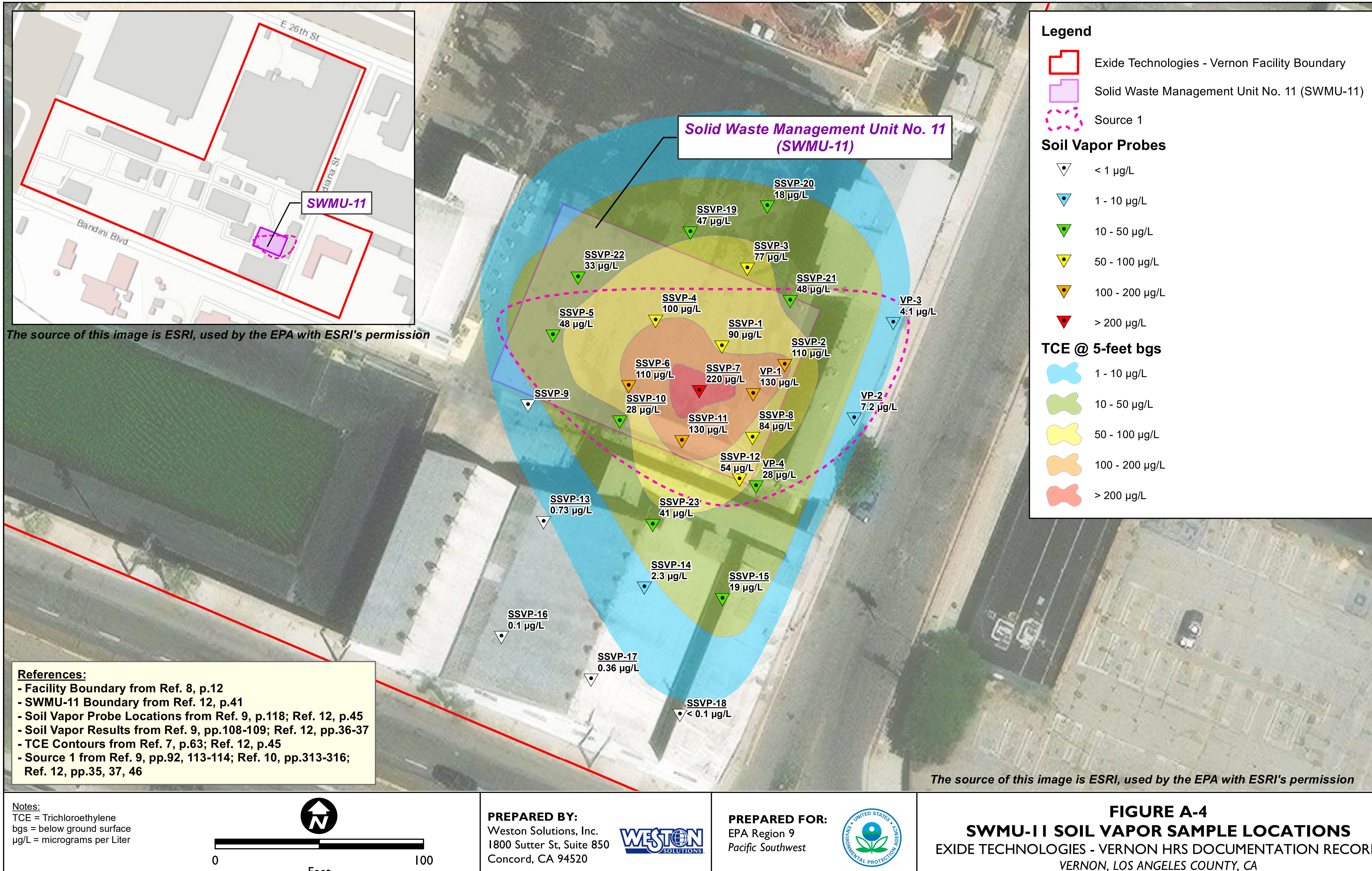
FIGURE A-3
SWMU-11 SOIL SAMPLE LOCATIONS
EXIDE TECHNOLOGIES - VERNON HRS DOCUMENTATION RECORD
VERNON, LOS ANGELES COUNTY, CA



Notes:
TCE = Trichloroethylene
bgs = below ground surface
µg/L = micrograms per Liter

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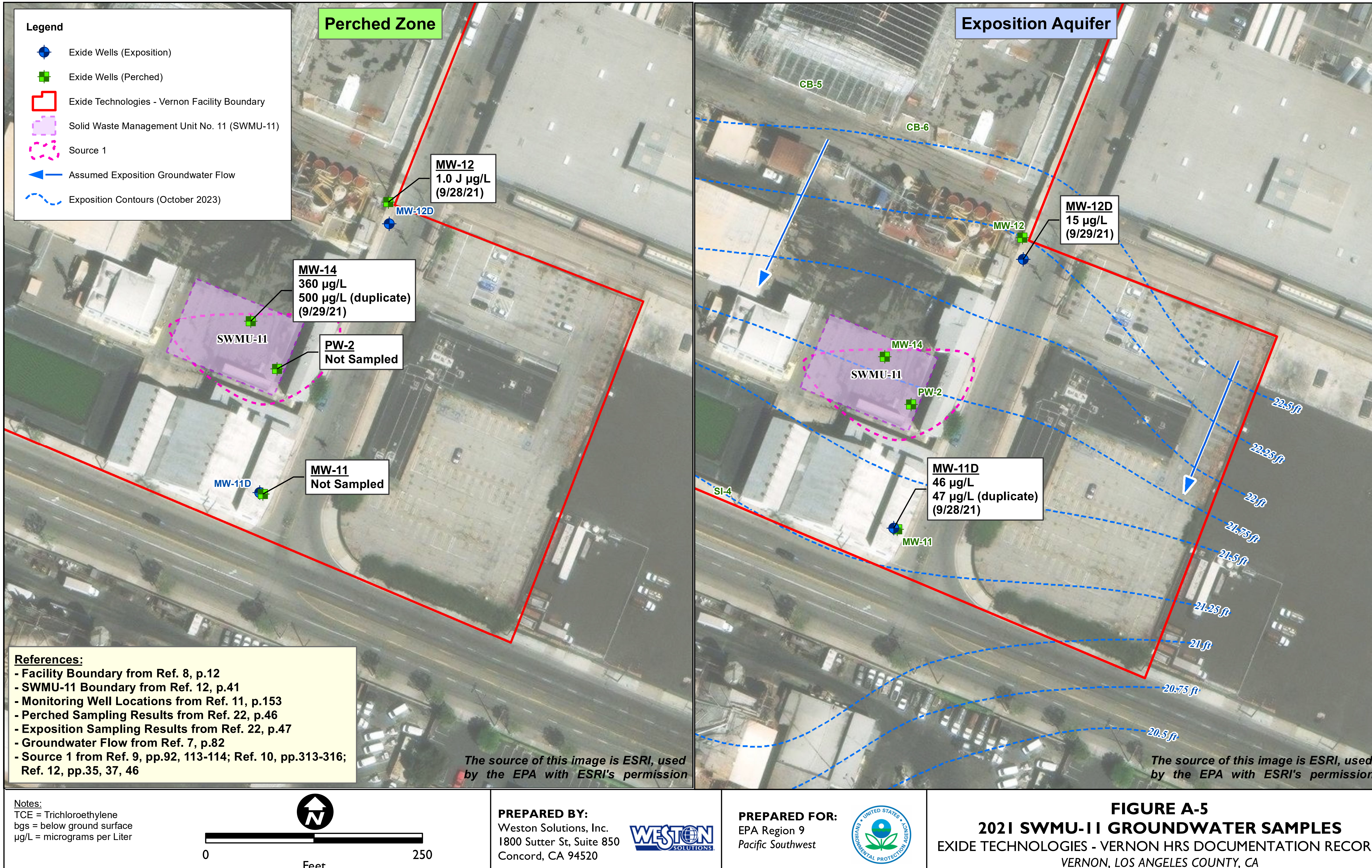
FIGURE A-4
SWMU-11 SOIL VAPOR SAMPLE LOCATIONS
EXIDE TECHNOLOGIES - VERNON HRS DOCUMENTATION RECORD
VERNON, LOS ANGELES COUNTY, CA



Notes:
TCE = Trichloroethylene
bgs = below ground surface
µg/L = micrograms per Liter

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FIGURE A-5
2021 SWMU-11 GROUNDWATER SAMPLES
EXIDE TECHNOLOGIES - VERNON HRS DOCUMENTATION RECORD
VERNON, LOS ANGELES COUNTY, CA

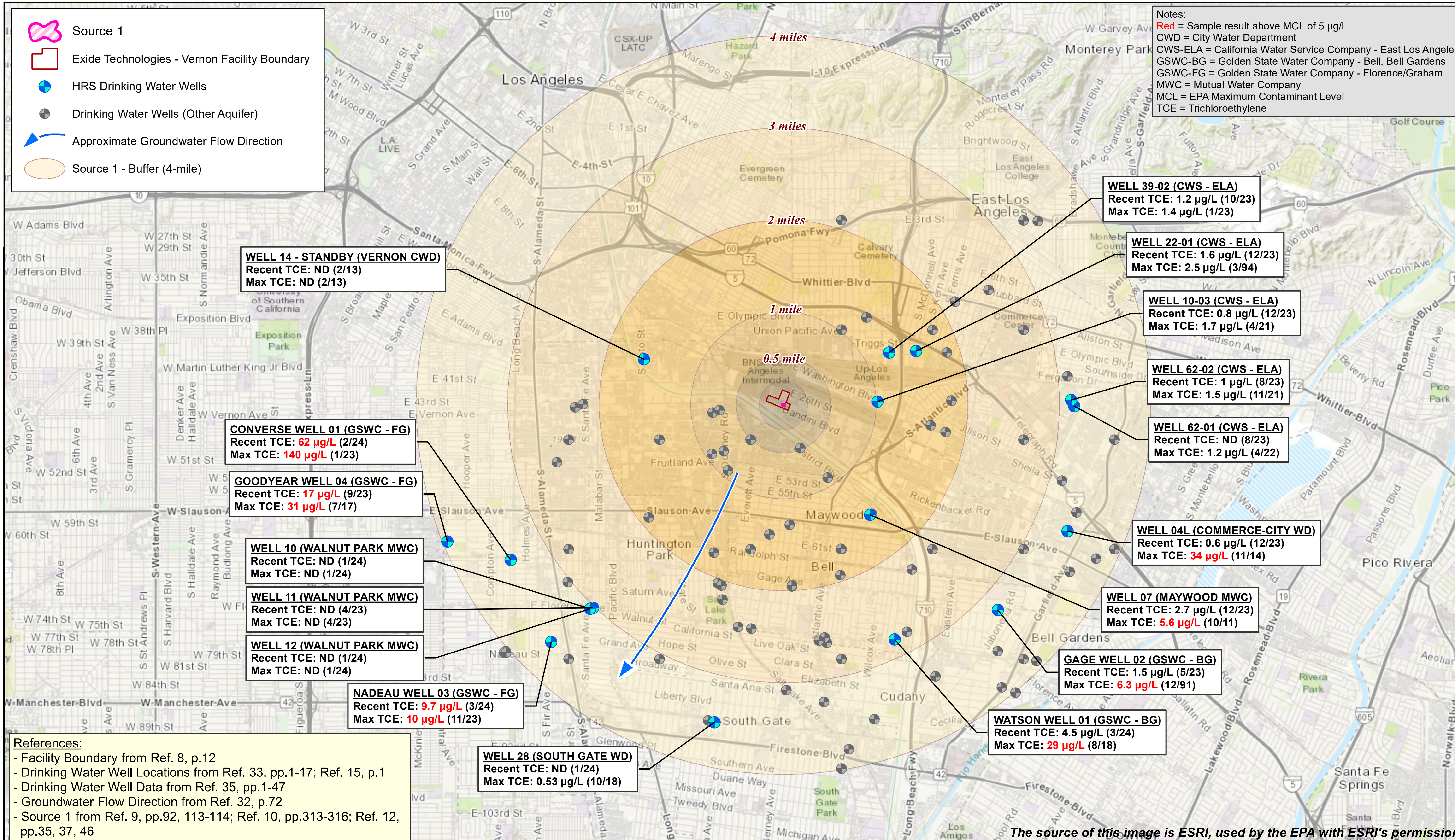

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FIGURE A-6
DRINKING WATER WELLS WITHIN 4 MILES
EXIDE TECHNOLOGIES - VERNON HRS DOCUMENTATION RECORD
VERNON, LOS ANGELES COUNTY, CA

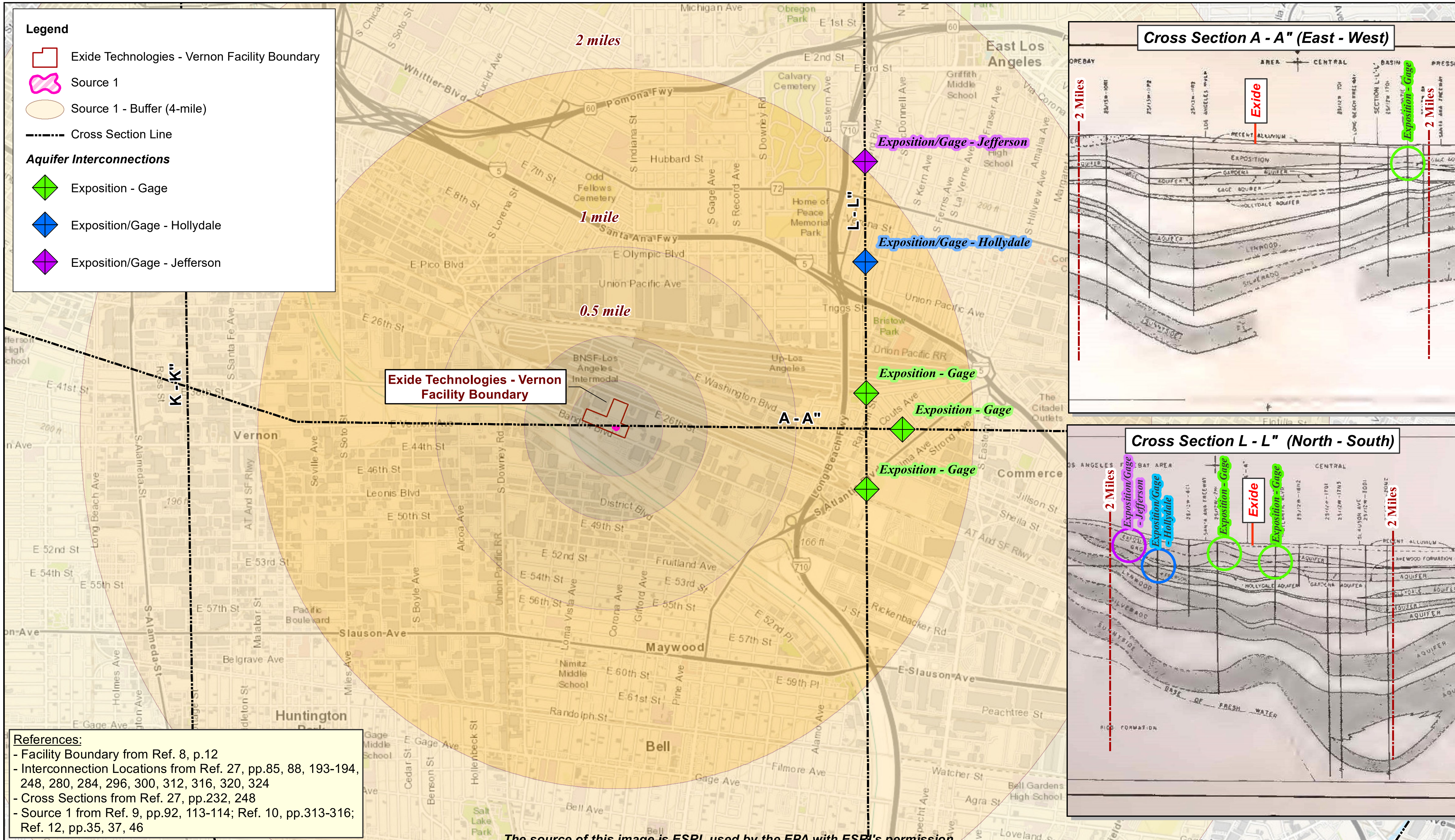

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FIGURE A-7
AQUIFER INTERCONNECTIONS WITHIN 2 MILES
EXIDE TECHNOLOGIES - VERNON HRS DOCUMENTATION RECORD
VERNON, LOS ANGELES COUNTY, CA

SITE DESCRIPTION

The former Exide Technologies – Vernon (Exide-Vernon) facility is located at 2700 South Indiana Street in the City of Vernon, Los Angeles County, California, 90058 (Figure A-1 of this HRS documentation record; Ref. 4, p. 9). For Hazard Ranking System (HRS) scoring purposes, the “Site” consists of the release of hazardous substances from former operations associated with the Exide facility. Hazardous substances associated with the HRS source includes trichloroethylene (TCE) (see Section 2.2 and subsections of this HRS documentation record).

The Exide facility began lead recycling operations in 1922. By 1982, the facility was conducting battery recycling and lead-refining operations in which lead-acid batteries were crushed and recycled in a secondary lead smelter system at the former Vernon plant (Ref. 5, p.42).

Previous owners of the facility included Morris P. Kirk & Sons, NL Industries, Gould Inc., and GNB Inc. Exide Technologies, Inc. acquired the property in 2000, and continued operations until closure in 2014, following a 2013 Stipulation and Order issued by the California Department of Toxic Substances Control (DTSC) that ordered Exide to temporarily suspend facility operations (Ref. 4, p.4; Ref. 5, p.42). Since 2013, DTSC has overseen numerous on-site and off-site investigations, as well as the implantation of a 2016 Final Closure Plan (Ref. 64, p.5-6).

In October 2020, a U.S. Bankruptcy Court issued an order that allowed Exide Technologies, Inc. to transfer it to an environmental response trust. The Vernon Environmental Response Trust (VERT) was created to facilitate the continuation of the cleanup activities (Ref. 64, p.6). Since October 2021, EPA and DTSC have overseen the actions of the VERT at the Exide-Vernon facility (Ref. 64, p.5-6).

Historical activities conducted at the Exide-Vernon facility included battery breaking; secondary smelting; lead refining; storage, handling, and transportation of batteries and other materials associated with recycling operations; and chemical processing (Ref. 5, p.42). Air emissions from stacks; inadequate maintenance and repair of the containment building; spills at the Exide-Vernon facility and spills from trucks transporting material to and from the facility; releases from a stormwater containment and other liquid containments; and insufficient dust controls contributed to the release and dispersion of lead-impacted airborne particulates (Ref. 5, p.42; Ref 6, p.5)

TCE contamination within the footprint of the old mixed-metals extrusion building, identified as Solid Waste Management Unit No. 11 (SWMU-11) in the southern portion of the facility (referred to as the “South Yard”), is elevated based on the HRS criteria (three times background) and exceeds the Maximum Contaminant Level (MCL) allowed for public drinking water sources (Figure A-2 of this HRS documentation record; Ref. 7, p.30-32).

TCE was used as a cooling medium during the extrusion of metal bars and stock into various shapes (Ref. 9, p.34). As documented in a 1986 Phase I Site Assessment and a 1990 RCRA Facility Assessment (RFA), the TCE was stored in 20-pound containers immediately south of SWMU-11 and was taken from the storage area and poured into an open storage vat that fed the extrusion process (Ref. 8, p.44; Ref. 65, p.16). It is unknown what happened to the excess TCE after the extrusion process, however ongoing releases reportedly occurred throughout the lifespan of operations (Ref. 8, p. 44; Ref. 9, p.34). It is unknown exactly when operations were started in this location; however, the mixed-metal operations ceased in approximately 1978 (Ref. 8, p. 44; Ref. 9, p. 34). Based on facility conditions and environmental investigations conducted, it is believed that the contamination found beneath SWMU-11 likely originated from surface releases of TCE (Ref. 8, p.6, 44; Ref. 9, p.34; Ref. 10, p.313-316; Ref. 12, p.12).

A dissolved phase fraction entered the groundwater and began to slowly migrate south-southeast with the hydraulic gradient. Based on the geology underlying SWMU-11, it appears that upon release, the TCE migrated vertically through approximately 75 feet of unsaturated sediments over time (Ref. 12, p.12).

Soil and soil vapor samples collected in the vicinity of SWMU-11 in 2005 and 2015 indicated significantly elevated concentrations of TCE in soil to a depth of 70 feet bgs, and in soil vapor to a depth of 68 feet bgs (Ref. 9, p.92, 113-114; Ref. 12, p.35, 37, 46).

On July 1, 2022, the California Environmental Protection Agency (CalEPA) requested that the U.S. Environmental Protection Agency (EPA) evaluate the former Exide facility and surrounding areas potentially impacted by the former facility's operations, as a candidate for the National Priorities List (NPL) (Ref. 13, p.1-2).

In November 2022, EPA completed a Preliminary Assessment (PA) at the former Exide-Vernon facility. The primary objective of the PA was to evaluate existing information to be used in the HRS characterization process, including source areas and levels of contamination in surface soil. The PA, which relied primarily on soil data collected by DTSC, concluded that the Exide – Vernon facility is a documented source of lead contamination and that historical operations at the facility likely contributed to the emission and deposition of lead along with other heavy metals onto the soil and other surfaces around the facility and surrounding areas. (Ref. 4, p.4-6, 19-20).

A Site Inspection (SI) was initiated in January 2023 with the initial objective to augment DTSC collected soils and groundwater data, however, EPA determined that DTSC's existing background data and residential sampling protocols needed to be amended to comport with HRS requirements (Ref. 7, pp. 10, 18). This resulted in an extensive background soil collection effort, modifications to DTSC-executed residential sampling beginning May 1, 2023, and supplemental groundwater sampling in the south yard (Ref. 7, p.10). The data and documentation identified during the SI was determined to be insufficient to meet the criteria for consideration under the HRS for the soil exposure pathway (Ref. 7, p.52). However, based on the results of the SI, as well as historical on-site sampling results, an observed release of TCE to groundwater within the Exposition through Jefferson hydrologic unit was established (Ref. 7, p.47). TCE was detected in the groundwater release sample collected from Exposition aquifer in 2021 at a concentration of 47 µg/L, which is considered significantly above background based on the result of 15 µg/L collected from the background well (Ref. 7, p. 47). This release is attributable, at least in part, to the Exide-Vernon facility as a sample was collected immediately downgradient of an area of documented TCE soil contamination, which was a result of historical operations (Ref. 7, p.47).

There are 52 known active drinking water wells within the 4-mile Target Distance Limit (TDL) of the source. These wells, which are operated by 14 distinct water purveyors, serve an estimated apportioned population of 306,890.50 (Ref. 34, p.1-18; Figure A-6 of this HRS documentation record). Of these 52 wells, 17 were identified as having at least some portion of their screening interval consistent with the depths of the Exposition through Jefferson hydrologic unit, which serves an estimated population of 133,746.29 (Ref. 33, p.1-17).

SITE SOURCES

One source was evaluated for scoring the Exide Technologies – Vernon facility (see Figure A-2 of this HRS documentation record). The source originated as part of historic operations at the facility. Detailed information about the source, with reference citations, is available in the following sections.

Hazardous substances associated with this source includes TCE.

Exide Technologies – Vernon Source		
Source Number	**Source Name**	**Source Type**
1	Solid Waste Management Unit No. 11 (SWMU-11)	Contaminated Soil

2.2 SOURCE 1 SOURCE CHARACTERIZATION

2.2.1 SOURCE IDENTIFICATION

Name of Source: SWMU-11 **Number of Source:** 1

Source Type: Contaminated Soil

Description and Location of Source (see Figure A-2 of this HRS documentation record):

On-site soils are contaminated with TCE, which is likely a result of historical on-site operations within the South Yard of the Exide-Vernon facility, identified as SWMU-11. SWMU-11 is located within the footprint of the old mixed-metals extrusion building. As shown on historical Sanborn Maps (Ref. 66, p.7), the old mixed-metals extrusion building was located immediately west of the current engineering building and had a size of approximately 10,000 ft^2 (Ref.8, p.44).

TCE was used as a cooling medium during the extrusion of metal bars and stock into various shapes (Ref. 9, p.34). As documented in a 1986 Phase I Site Assessment and a 1990 RCRA Facility Assessment (RFA), the TCE was stored in 20-pound containers immediately south of SWMU-11 and was taken from the storage area and poured into an open storage vat that fed the extrusion process (Ref. 8, p.44; Ref. 65, p.16). It is unknown what happened to the excess TCE after the extrusion process, however ongoing releases reportedly occurred throughout the lifespan of operations (Ref. 8, p. 44; Ref. 9, p.34). It is unknown exactly when operations were started in this location; however, the mixed-metal operations ceased in approximately 1978 (Ref. 8, p.44; Ref. 9, p. 34).

Based on facility conditions and environmental investigations conducted, it is believed that the contamination found beneath SWMU-11 likely originated from surface releases of TCE (Ref. 8, p.6, 44; Ref. 9, p.34; Ref. 10, p.313-316; Ref. 11, p.85). Based on previous on-site soil vapor monitoring, the TCE likely volatilized into the soil gas. Soil and soil vapor samples collected in the vicinity of SWMU-11 in 2005 and 2015 indicated significantly elevated concentrations of TCE (Ref. 10, p.313-316). As part of the 2005 Phase 2 RFI conducted by Exide's contractor, the TCE-impacted subsurface soil in the South Yard was assessed to determine the extent of subsurface contamination and potential vapor intrusion impacts (Ref. 9, p. 60, 80-83). A subsequent investigation of TCE impacted soil beneath SWMU-11 was conducted in 2015 under the supervision of DTSC (Ref. 10, p.313-316).

Based on the geology underlying SWMU-11, the TCE appears to have migrated vertically through approximately 75 feet of unsaturated sediments, where a dissolved phase fraction entered the groundwater and began slowly migrating south-southeast consistent with hydraulic gradient (Ref 12, p.12). In addition, groundwater monitoring wells were installed in 1986 and 1987 at the location of the former storage vats where levels of TCE have been observed at an order of magnitude higher than the maximum concentrations measured in nearby monitoring wells (Ref. 7, p.31-32, Ref. 11, p.85).

The full extent of contaminated soil at SWMU-11 (Source 1) could not be adequately determined, however based on soil and soil vapor sampling conducted from 2005 through 2015, it is estimated to cover a surface area of at least 14,950 ft^2, with an approximate depth of at least 75 feet below the ground surface (ft bgs). (Ref. 9, p.92, 113-114; Ref. 10, p.313-316; Ref. 12, p.35, 37, 46; see Figure A-4 of this HRS documentation record).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

On-site soils at SWMU-11 (Source 1) are contaminated with TCE, which is likely a result of historical on-site operations within the South Yard. As part of the 2005 Phase 2 RFI conducted by Exide's contractor, the TCE-impacted subsurface soil beneath SWMU-11 was assessed to determine the extent of subsurface contamination and potential vapor intrusion impacts. A subsequent investigation of TCE impacted soil beneath SWMU-11 was conducted in 2015 under the supervision of DTSC (Ref. 9, p.80-83).

As shown in the table below and Figure A-3 of this HRS documentation record, soil samples from SWMU-11 were collected from 8 soil borings (two in 2005, one in 2014, and five in 2015) at depths ranging from 1 ft to 76 ft bgs (Ref.10, p.313-316). The highest TCE soil result observed in shallow soil was 990 micrograms per kilogram (µg/kg) at a depth of 1.5 feet (Ref. 10, p. 149; Ref. 12, p.35). The highest TCE soil result observed in deeper soil was 150 µg/kg at a depth of 70 feet (Ref.9, p.92).

Based on the geology underlying SWMU-11, it appears that upon release, the TCE migrated vertically through approximately 75 feet of unsaturated sediments over time (Ref. 12, p.42-43).

As shown in the table below and Figure A-4 of this HRS documentation record, a total of 68 soil vapor samples (including 4 duplicate samples) were collected from 27 temporary vapor probes (23 probes in 2005, four probes in 2015) at depths ranging from 0.5 ft to 68 ft bgs. The maximum documented TCE soil vapor concentration observed in shallow soil was 220 µg/L at a depth of 5 feet (Ref. 9, p.108; Ref. 12, p.36). The maximum documented TCE soil vapor result observed in deeper subsurface soil was 730 µg/L at a depth of 68 feet (Ref. 12, p.37). The vapor data indicate that the concentration of vapor-phase TCE decreases with depth suggesting that the source was surficial in nature (Ref. 12, p.11).

The TCE contamination appears to have migrated to the groundwater beneath Source 1, as discussed in Section 3.1.1 of this HRS Documentation Record.

SWMU-11 Soil Sampling Results					
Sample Location	**Depth (ft bgs)**	**Date**	**TCE[1] (µg/kg)**	**DL (µg/kg)**	**Reference**
HSA-24	8.5	12/5/2005	2.5	1.6	Ref. 9, p.92; Ref. 10, p.160; Ref. 12, p.35
	70	12/5/2005	130	1	Ref. 9, p.92; Ref. 10, p.160; Ref. 12, p.35
	70[d]	12/5/2005	150	1	Ref. 9, p.92
HSA-25	5	12/6/2005	13	2	Ref. 9, p.92; Ref. 10, p.160; Ref. 12, p.35
	70	12/6/2005	21	2	Ref. 9, p.92; Ref. 10, p.160; Ref. 12, p.35
TB-67D	1.5	2/20/2015	6.1	2	Ref. 10, p.149
	7.5	3/12/2015	63	1.7	Ref. 10, p.149; Ref. 72, pp. 1580-1581
	11.5	3/12/2015	2.8	2	Ref. 10, p.160; Ref. 72, pp. 1583-1584
	75	3/13/2015	16 J	1.5	Ref. 10, p.160-161; Ref. 72, pp. 1688-1689
VP-01	1.5	2/23/2015	990	96	Ref. 10, p.149; Ref. 12, p.35
	6	2/26/2015	93	1.2	Ref. 10, p.149; Ref. 12, p.35; Ref. 72, pp. 39-40
	8	2/26/2015	40	1.8	Ref. 10, p.160; Ref. 12, p.35; Ref. 72, pp. 42-43
	13	2/26/2015	6.5	2	Ref. 10, p.160; Ref. 12, p.35; Ref. 72, pp. 36-37
	15	2/26/2015	U	1.9	Ref. 10, p.160-161; Ref. 12, p.35; Ref. 72, pp. 45-46
	68	2/27/2015	42	1.7	Ref. 10, p.160; Ref. 12, p.35; Ref. 72, p.152
	76	2/27/2015	33	1.3	Ref. 10, p.160; Ref. 12, p.35; Ref. 72, p.155
VP-02	1	8/24/2015	3.5	2	Ref. 10, p.149; Ref. 12, p.35; Ref. 73, pp. 1207-1208
	3	8/24/2015	U	2.1	Ref. 10, p.149; Ref. 12, p.35; Ref. 73, pp. 1210-1211
	5	8/24/2015	U	2.2	Ref. 10, p.149; Ref. 12, p.35; Ref. 73, pp. 1213-1214
	18	8/25/2015	2.1	1.9	Ref. 10, p.161; Ref. 12, p.35; Ref. 73, pp. 1369-1370
VP-03	1	8/24/2015	4.3	1.9	Ref. 10, p.149; Ref. 12, p.35; Ref. 73, pp. 1216-1217
	3	8/24/2015	3.2	2.3	Ref. 10, p.149; Ref. 12, p.35; Ref. 73, pp. 1219-1220
	5	8/24/2015	U	2.2	Ref. 10, p.149; Ref. 12, p.35; Ref. 73, pp. 1222-1223
	18	8/25/2015	U	2	Ref. 10, p.161; Ref. 12, p.35; Ref. 73, pp. 1366-1367
VP-04	5	2/23/2015	4.2	2	Ref. 10, p.149; Ref. 12, p.35
	10	2/25/2015	U	1.9	Ref. 10, p.161; Ref. 12, p.35
	16	2/25/2015	3.6	1.9	Ref. 10, p.161; Ref. 12, p.35
	20	2/25/2015	U	1.7	Ref. 10, p.161; Ref. 12, p.35
Background Sample – Upgradient of Source					
TB-58I	4.5	1/22/2014	U	4.2	Ref. 10, p.146; Ref. 71, pp. 379-380
	8	1/22/2014	U	5.3	Ref. 10, p.155; Ref. 71, pp. 382-383
	35	1/22/2014	U	3.8	Ref. 10, p.155; Ref. 71, pp. 385-386

TCE = Trichloroethylene
U = Analyte not detected above DL
J = Result is less than Reporting Limit but greater than DL and is approximated
d = duplicate sample
ft bgs = feet below ground surface
µg/kg = microgram per kilogram
DL = Detection Limit (for HRS purposes, the DL is defined as the lowest amount that can be distinguished from the normal random ‘‘noise’’ of an analytical instrument or method)
1 = Samples analyzed via EPA Method 8260B

SWMU-11 Soil Vapor Sampling Results					
Sample Location	**Depth (ft bgs)**	**Date**	**TCE[1] (µg/L)**	**MDL (µg/L)**	**References**
SSVP-1	5	12/5/2005	90	0.1	Ref. 9, pp. 108-109; Ref. 12, p. 36
	15	12/5/2005	170	0.1	
	15[d]	12/5/2005	170	0.1	
	30	12/8/2005	32	0.1	
	30[d]	12/8/2005	14	0.1	
SSVP-2	5	12/6/2005	110	0.1	
	20	12/6/2005	79	0.1	
SSVP-3	5	12/7/2005	77	0.1	
	20	12/7/2005	27	0.1	
SSVP-4	5	12/6/2005	100	0.1	
	18	12/6/2005	5.1	0.1	
SSVP-5	5	12/7/2005	48	0.1	
	20	12/6/2005	1.2	0.1	
SSVP-6	5	12/6/2005	110	0.1	
	20	12/6/2005	1.1	0.1	
SSVP-7	5	12/7/2005	220	0.1	
	20	12/7/2005	4.9	0.1	
SSVP-8	5	12/6/2005	84	0.1	
	20	12/6/2005	1	0.1	
SSVP-9	20	12/7/2005	0.35	0.1	
SSVP-10	5	12/7/2005	28	0.1	
	20	12/7/2005	0.36	0.1	
SSVP-11	5	12/7/2005	120	0.1	
	5 [d]	12/7/2005	130	0.1	
	20	12/7/2005	0.7	0.1	
SSVP-12	5	12/6/2005	54	0.1	
	5 [d]	12/6/2005	53	0.1	
	20	12/6/2005	26	0.1	
SSVP-13	5	12/7/2005	0.73	0.1	
	20	12/6/2005	1.7	0.1	
	20[d]	12/6/2005	1.5	0.1	
SSVP-14	5	12/7/2005	2.3	0.1	
	20	12/7/2005	11	0.1	
SSVP-15	5	12/6/2005	19	0.1	
	20	12/6/2005	31	0.1	
SSVP-16	20	12/5/2005	0.2	0.1	
SSVP-17	5	12/5/2005	0.36	0.1	
	20	12/5/2005	1.1	0.1	
SSVP-18	5	12/5/2005	U	0.1	Ref. 9, p.109; Ref. 12, p. 36
	20	12/5/2005	1.8	0.1	
SSVP-19	5	12/7/2005	47	0.1	
	20	12/7/2005	0.43	0.1	
SSVP-20	5	12/8/2005	18	0.1	
	20	12/8/2005	4	0.1	
SSVP-21	5	12/8/2005	48	0.1	
	20	12/8/2005	21	0.1	

SWMU-11 Soil Vapor Sampling Results					
Sample Location	**Depth (ft bgs)**	**Date**	**TCE[1] (µg/L)**	**MDL (µg/L)**	**References**
	20	12/8/2005	21	0.1	
SSVP-22	5	12/8/2005	33	0.1	
	20	12/8/2005	0.12	0.1	
SSVP-23	5	12/8/2005	41	0.1	
	20	12/8/2005	35	0.1	
VP-1	5	10/1/2015	130	0.069	Ref. 12, p.37; Ref. 67, p.88
	5	12/16/2015	98	0.069	
	5[d]	12/16/2015	88	0.069	
	15	10/1/2015	85	0.069	
	15	12/16/2015	87	0.069	
	68	10/1/2015	730	0.069	
VP-2	5	10/1/2015	7.2	0.069	
	5	12/16/2015	6.8	0.069	
	18	10/1/2015	12	0.069	
	18	12/16/2015	15	0.069	
VP-3	5	10/1/2015	4.1	0.069	
	5	12/16/2015	3.4	0.069	
	18	10/1/2015	9.3	0.069	
	18	12/16/2015	10	0.069	
VP-4	5	9/30/2015	U	0.069	
	5	12/15/2015	28	0.069	
	20	10/1/2015	55	0.069	
	20	12/16/2015	75	0.069	

TCE = Trichloroethylene
U = Analyte not detected above MDL
MDL = Method Detection Limit (For HRS purposes, the MDL is the equivalent of a Detection Limit, defined as the lowest amount that can be distinguished from the normal random ‘‘noise’’ of an analytical instrument or method)
d = duplicate samples
µg/L = micrograms per Liter
1 = 2005 samples analyzed via EPA Method 8260B; 2015 samples analyzed via EPA Method TO-15

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

All hazardous substances associated with Source 1 are available to the groundwater pathway based on a containment factor value of greater than zero (Ref. 1, Section 2.2.3).

Containment Description	Containment Factor Value	References
Release to groundwater: Based on evidence of hazardous substance migration (contamination detected in groundwater samples), a containment factor of 10 is assigned.	10	Ref. 1, Section 3.1.2.1, Table 3-2; Ref. 25, p.14, 46; Ref. 26, p.15; Ref. 22, p.47

2.4.2. HAZARDOUS WASTE QUANTITY

2.4.2.1.1 Hazardous Constituent Quantity (Tier A)

The hazardous constituent quantity for the contaminated soil at SWMU-11 (Source 1) could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1). There are insufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 1 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1).

Hazardous Constituent Quantity Value: Not Evaluated

2.4.2.1.2 Hazardous Wastestream Quantity (Tier B)

The hazardous wastestream quantity for the contaminated soil at SWMU-11 (Source 1) could not be adequately determined according to the HRS requirements; that is, the mass of the wastestreams containing hazardous substances, and eligible pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of the wastestream plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 1 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, volume (Ref. 1, Section 2.4.2.1.2).

Hazardous Wastestream Quantity Value: Not Evaluated

2.4.2.1.3 Volume (Tier C)

The exact volume for the contaminated soil at SWMU-11 (Source 1) could not be adequately determined according to the HRS requirements (Ref. 1, Section 2.4.2.1.3). Monitoring wells, subsurface soil vapor samples, and subsurface soil samples located within SWMU-11 contained TCE at concentrations significantly above background to depths of at least 70 ft bgs (Ref.9, p.92; Ref. 12, p. 35; see Tables in section 2.2.2 of this HRS documentation record). However, the boundaries and total depths of the plume are not sufficiently defined to get an exact volume. As the volume cannot be determined with reasonable confidence, the volume measure value of 0 is assigned as per HRS Section 2.4.2.1.3. Scoring proceeds to the evaluation of Tier D, area (Ref. 1, Section 2.4.2.1.3).

Volume Assigned Value: 0

2.4.2.1.4 Area (Tier D)

The area of contaminated soil at SWMU-11 (Source 1) could not be adequately determined, however based on soil and soil vapor sampling conducted in 2005 and 2015, it is estimated to cover an area of at least 14,950 ft^2 (Ref.9, p.92; Ref. 12, p. 35; see Figure A-3 of this HRS documentation record). As the area cannot be determined with reasonable confidence, the area measure value of >0 is assigned as per HRS Sections 2.4.2.1.4.

Area Assigned Value: >0

Source Hazardous Waste Quantity Value

According to the Hazard Ranking System (HRS) final rule, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) is assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

Tier Evaluated	Source 1 Values
A	Not Evaluated
B	Not Evaluated
C	0
D	>0

Source 1 Hazardous Waste Quantity Value: >0

SITE SUMMARY OF SOURCE DESCRIPTIONS

Source No.	Source Hazardous Waste Quantity Value (see Section 2.4.2)	Containment			
		Groundwater	Surface Water	Gas	Air Particulate
1	>0	10	NE	NE	NE
TOTAL	>0				

Notes:
NE = Not Evaluated.

3.0 GROUND WATER MIGRATION PATHWAY

3.0.1 GENERAL CONSIDERATIONS

Ground Water Migration Pathway Description

Based on historical on-site sampling results, an observed release from the facility to groundwater within the Exposition aquifer has been documented (see Section 3.1.1 of this document for documentation of the observed release). For this HRS consideration, hazardous substances associated with the observed release includes TCE, which has been detected at concentrations significantly above background in monitoring wells immediately downgradient of SWMU-11 (Source 1) where TCE was used as a cooling medium during the metals extrusion process (Ref. 9, p.34).

TCE has consistently been detected above the MCLs in the perched zone beneath SWMU-11 since the 1980s and detected above the MCL in the Exposition aquifer since 2015, when monitoring wells screened within the Exposition aquifer were installed (see Sections 2.2 and 3.1.1 of this HRS documentation record).

Regional Geology/Aquifer Description

The Exide-Vernon facility lies within the Central Subbasin in the Coastal Plain of the Los Angeles Groundwater Basin. The Central Subbasin is generally bound to the north by the folded, uplifted, and eroded Tertiary basement rocks of the La Brea High surface divide; to the northeast and east by the less permeable Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills; to the southeast by the Coyote Creek (approximate Los Angeles County/Orange County boundary); and to the southwest by the Newport Inglewood Uplift, a regional anticline associated with the Newport Inglewood fault system. (Ref. 27, p.118-119, 168-169; Ref. 28, p.1-2).

The Central Subbasin has historically been divided into the Los Angeles Forebay at the northwest, the Montebello Forebay at the north, the Whittier Area at the northeast, and the Central Basin Pressure Area at the center and southwest. However, these areal distinctions are appropriate for geographical purposes only and do not accurately represent hydrogeologic conditions within the areas. In actuality, the hydrogeologic forebays, which are generally characterized by unconfined and relatively interconnected aquifer systems, are limited to only small regions within the greater Forebay areas (Ref. 27, p.168-169, 193-198).

The Montebello Forebay, as well as the Los Angeles Forebay to a lesser degree, serves as the primary groundwater recharge areas for both shallow and deep aquifers across the entirety of the subbasin. The Central Basin Pressure Area is generally characterized by confined aquifer systems separated by relatively impermeable clay layers, although semipermeable zones within these layers allow aquifers to be interconnected in some areas. These semipermeable zones gradually decrease in frequency and magnitude with increasing distance from the forebays (Ref. 27, p.168-169, 186-187, 193-198; Ref. 28, p.1-2).

Throughout much of the subbasin, the Pleistocene-age aquifers are under confined conditions due to the presence of fine-grained, low-permeability interbedded sediments. Although these fine grained sediments, or aquicludes, generally restrict the downward migration of groundwater from overlying aquifers, semipermeable zones within the aquicludes allow aquifers to be interconnected in some areas (Ref. 27, p.168-169). In addition, hydrogeologic modeling of multi-aquifer systems similar to that found in the Central Basin Pressure Area, has shown that groundwater wells screened across multiple aquifers (or wells with improperly constructed annular seals that cross multiple aquifers) can act as a direct pathway for the migration of significant volumes of shallow groundwater into deep confined aquifers when vertical hydraulic head variations create a downward hydraulic gradient. The process of this downward migration has increased in areas where the deeper aquifers have periods of high-volume pumping such as seasonal demand. Furthermore, additional studies have shown that liquids that are denser than water (i.e., dense non-aqueous phase liquids [DNAPLs] such as PCE and TCE) can migrate downward through a multi-aquifer well even when vertical hydraulic head variations create an upward hydraulic gradient (Ref. 27, p.168-169; Ref. 29, p.13-17; Ref. 31, p.1-4).

The regional groundwater flow direction within the subbasin, which was calculated using data from wells screened within the Upper San Pedro Formation (Lynwood through Silverado aquifers), is generally to the southwest. Based upon data collected between 2007 and 2022, flow within these deeper aquifers in the vicinity of the Exide-Vernon facility trended towards the southwest with temporal variations from west to south-southwest (Ref. 32, p.21-22, 69, 72-86).

Geologic units typically found beneath the subbasin include:

- *Holocene-age Alluvium*: Recent alluvium is primarily stream deposited gravel, sand, silt and clay with some interbedded littoral and estuary or bay deposits near the ocean. Geologic members found within the alluvial deposits include the Semiperched aquifer, Bellflower aquiclude, Gaspur aquifer, and Ballona aquifer (Ref. 27, pp. 63-64).

    - *Semiperched Aquifer*: Includes coarse sands and gravels found on or near the surface of much of the Coastal Plain of Los Angeles County, varying in thickness from 0 to 60 feet and may contain significant amounts of unconfined water (Ref. 27, p.64, 172).

    - *Bellflower Aquiclude*: Directly beneath the Semiperched aquifer, with sediments of lesser permeability that restrict some vertical movement of ground water, varying in thickness from 0 to 200 feet, and has a maximum depth of 100 feet (Ref. 27, p.65-66, 172).

    - *Gaspur Aquifer*: Water-bearing zone directly beneath the Bellflower aquiclude, where the upper part is medium to coarse-textured sand while the lower part consists of sand, gravel, and cobbles as large as five inches in diameter, with a thickness ranging up to about 120 feet, and a maximum depth of 160 feet (Ref. 27, p.66-67, 173).

    - *Ballona Aquifer*: Water-bearing zone found in a relatively small area in the northwest section of the basin, composed of coarse sand, rounded to subrounded gravel, and cobbles up to five inches in diameter that are of both granitic and metamorphic origin, varying in thickness from 10 to 40 feet (Ref. 27, p.69-70).

- *Upper Pleistocene Lakewood Formation:* Underlying the recent alluvium is the Lakewood Formation, where the upper part includes rapid lithologic changes, with discontinuous permeable zones and considerable variation in particle size, typical of stream alluviation with fine-grained sediments, and the lower part includes gravels and coarse sands, confined to a narrow extension reaching the Newport-Inglewood uplift. The Lakewood formation is divided into the contemporaneous Artesia and Exposition aquifers, the hydraulic continuous Gage and Gardena aquifers, and the unnamed aquicludes between the aquifers (Ref. 27, p.74-75).

    - *Artesia Aquifer*: Water-bearing zone of varying thickness, composed of coarse gravel, coarse to fine sand and interbedded silts and clays, generally below the southern end of the Gaspur aquifer, and appears to be related to the San Gabriel River, Coyote Creek, and Santa Ana River system (Ref. 27, p.75-76, 280, 284). Stratigraphically, the Artesia aquifer is generally deeper than the Gaspur aquifer, however some upper reaches abut directly with the Gaspur, and there are multiple uplift locations where the Artesia aquifer is higher in elevation (Ref. 27, p.77).

    - *Exposition Aquifer:* Water-bearing zone with a maximum thickness of 100 feet, and a maximum depth of 160 feet, consisting of sand and gravel members separated by discontinuous lenses of silt and clay, generally below the northern end of the Gaspur aquifer, and appears to be related to the Los Angeles River drainage system (Ref. 27, p.75, 77, 173, 280, 284). Stratigraphically, as with the Artesia aquifer, the Exposition aquifer is generally deeper than the Gaspur aquifer, while some upper reaches abut directly with the Gaspur, with multiple uplift locations where the Exposition aquifer is higher in elevation (Ref. 27, p.77). Lower members of the Exposition extend beneath the Gaspur aquifer and merge laterally with the Artesia aquifer, and horizontally with the underlying Gage aquifer (Ref. 27, p.77).

    - *Gage Aquifer*: Water-bearing zone as deep as 350 feet, with a maximum thickness of 10 to 160 feet, comprised of fine to coarse sand with variable amounts of gravel, sandy silt, and clay (Ref. 27, p.78). The Gage aquifer is hydraulically connected with contemporaneous Gardena aquifer, overlapping throughout the basin (Ref. 27, p.79). The combined Gage-Gardena aquifer merges with the shallower Exposition aquifer near the Montebello plain, and merges with the deeper Lynwood and Sunnyside aquifers in the western part of the basin (Ref. 27, p.77, 80, 300, 304).

    - *Gardena Aquifer:* Similar in thickness, elevation to maximum depth of 290 feet, and composition to those of the Gage aquifer, and hydraulically continuous with the Gage throughout much of its extent (Ref. 27, p.80, 82, 174). The combined Gage-Gardena aquifer merges with the shallower Exposition aquifer near the Montebello plain, and merges with the deeper Lynwood and Sunnyside aquifers in the western part of the basin (Ref. 27, p.77, 80. 300, 304).

- *Lower Pleistocene San Pedro Formation:* Underlying the unnamed upper Pleistocene deposits of the Lakewood Formation, the San Pedro Formation includes all lower Pleistocene strata and deposits which underlying the West Basin (Ref. 27, p.82). The San Pedro Formation and is comprised of sand deposits with some fine gravel, silty sand, and clay, containing the Hollydale, Jefferson, Lynwood, Silverado, and Sunnyside aquifers (Ref. 27, pp. 83, 84).

    - *Hollydale Aquifer:* Uppermost aquifer within the San Pedro formation, consisting of sands and gravels in the northeastern portion of the area, and sands with muds, clays, and marine shells toward the Newport- Inglewood uplift, with a thickness of 10 to 100 feet and a maximum depth of 475 feet (Ref. 27, p.85, 174). The Hollydale aquifer is discontinuous in extent, with an irregular, sinuous course, and does not yield large quantities of water, recharging only where it merges with the overlying Gage-Gardena aquifer (Ref. 27, p.85, 86, 312).

    - *Jefferson Aquifer*: Water-bearing zone comprised of fine-grained sediments, and sand with gravelly and clayey lenses, with a thickness up to 140 feet and a maximum depth of 640 feet, and is considerably folded (Ref. 27, p.87, 174). Although it does not crop out on the surface, the Jefferson aquifer does merge with the overlying Hollydale aquifer and with the Gage-Gardena aquifer at multiple locations (Ref. 27, p.88, 320).

    - *Lynwood Aquifer*: Water-bearing zone comprised continental deposits of coarse gravels, sands, silts, and clays, and marine deposits of sand, gravel, silts, and clays, with a thickness between 50 and 200 feet and a maximum depth of 720 feet (Ref. 27, p.89, 175). While there are known areas where the Lynwood aquifer merges with overlying aquifers, the lack of continuous permeable materials to conduct water vertically downward limits the recharging (Ref. 27, p.91, 328, 332).

    - *Silverado Aquifer*: Water-bearing zone comprised continental deposits of coarse to fine sands and gravels are interbedded with silts and clays, and marine deposits of sand, gravel, silt, and clay, with a maximum thickness of 500 feet and a maximum depth of 1,070 feet (Ref. 27, p.91-92, 175). The Silverado aquifer is in hydraulic continuity with the Gage-Garden and the Lynwood aquifers, and merges with the Lynwood, Jefferson, Hollydale and Gage-Gardena aquifers in the Montebello Forebay Area (Ref. 27, p.93, 344, 348).

    - *Sunnyside Aquifer*: Water-bearing zone comprised of coarse-grained sands and gravels separated by fine-grained interbeds of sandy clay and clay, with a maximum thickness of 300 feet and a maximum depth of 1,600 feet (Ref. 27, p.95). The Sunnyside merges with the Silverado and other overlying aquifers in multiple areas (Ref. 27, p.96, 360).

The Exide-Vernon facility is located within the eastern portion of the Los Angeles Forebay geographical area (Ref. 27, p.212); however, underlying hydrogeologic conditions are more accurately represented by those typically identified with the Central Basin Pressure Area (Ref.27, p.232, 248). Groundwater beneath the facility is typically found within the coarser-grained sediments of the upper Pleistocene Lakewood Formation (Exposition and Gage-Gardena aquifers), and the lower Pleistocene San Pedro Formation (Hollydale, Jefferson, Lynwood, Silverado, and Sunnyside aquifers) (Ref. 22, p.10; Ref. 28, p.1-2).

The elevations and depths of the aquifers underlying the Exide-Vernon facility, as estimated from published source material, are presented in the table below. Irregular patches of a perched or semi-perched aquifer are also present within the Holocene alluvium throughout much of the subbasin. Although significant amounts of water can be found within these perched water-bearing zones, they are often discontinuous over relatively short distances and have historically only had minimal economic benefit. Thus, these perched aquifers do not meet the criteria of an “aquifer” for HRS purposes (Ref. 22, p.10; Ref. 28, p.1-2).

Estimated Aquifer Elevations / Depths Beneath Exide-Vernon Facility

Aquifer	Estimated Elevation (ft amsl)		Estimated Depth (ft bgs)	
	Top	Base	Top	Base
Exposition (1)	80	0	95	175
Gage-Gardena (2)	-30	-85	205	260
Hollydale (2)	-155	-190	330	365
Jefferson (2)	-345	-375	520	550
Lynwood (2)	-430	-550	605	725
Silverado (2)	-635	-750	810	925
Sunnyside (2)	-875	-1,030	1,050	1,205

Notes:
1 = As described in 2021 Groundwater Monitoring Report (Ref. 22, p.10)
2 = As estimated from Cross-sections A-A’-A” and L-L’-L” (Ref. 27, p.232, 248)
ft amsl = feet above mean sea level
ft bgs = feet below ground surface
References: Ref. 22, p.10; Ref. 27, p.232, 248

For the purposes of this HRS Documentation Record, the Exposition aquifer beneath the Exide-Vernon facility is defined as being between 95 ft bgs and 175 ft bgs; which is based on the data reported in the 2021 Groundwater Monitoring Report (Ref. 22, p.10). Water-bearing units identified at shallower depths are defined as being associated with one or more perched (or semi-perched) aquifers. During historical on-site investigations, discontinuous zones of saturated soils were identified at depths between approximately 73 ft bgs and 90 ft bgs. These depths are consistent with the lower portion of the generally fine-grained unit that is commonly referred to as the Bellflower aquitard (or aquiclude) (Ref. 22, p.10).

Based on historical subsurface investigations at the Exide-Vernon facility, the soil underlying the property is composed primarily of sand and silt with lesser amounts of clay and humus (Ref. 5, p. 44). Non-native soil fill materials have been documented down to a depth of approximately 45 ft bgs in the vicinity of the facility (Ref. 10, p.12).

There are currently 24 on-property and four off-property wells that are regularly monitored within the "perched zone" and 10 on-site and five off-site wells that are regularly monitored within the Exposition aquifer. Declining water levels have been observed within both zones and, since 2019, ten of the "perched" wells and four of the "Exposition" wells have been documented as dry. Due to the discontinuous nature of the "perched" zones across the facility, it is not meaningful to calculate a generalized flow direction; however, the flow direction of the Exposition aquifer beneath the facility has been calculated as being towards the southwest during the October 2023 SI groundwater sampling event (Ref. 7, p.43; Ref. 22, p.10).

3.0.1.1 Ground Water Target Distance Limit

There are 52 known active drinking water wells within 4 miles of Source 1 (Ref. 15, p.1; Figure A-6 of this HRS documentation record). These wells, which are operated by 14 distinct water purveyors, serve an estimated apportioned population of 306,890.50. Of these 52 wells, 17 wells operated by eight purveyors were identified as having at least some portion of their screening interval consistent with the depths of the Exposition through Jefferson hydrologic unit, which serves an estimated population of 133,746.29, as shown in the table below (Ref. 33, p.1-17; Ref. 34, p.1-18; Ref. 15, p.1; Fig A-6 of this HRS Documentation Record).

Water Purveyors Operating Active Wells/Intakes Screened Within the Exposition to Jefferson Hydrologic Unit Within the Four-Mile Target Distance Limit

Water Company Name	No. of Wells / Intakes	Total Population Served (1)	Population per Well	No. of Wells Within TDL	No. of Wells Screened in Exposition - Jefferson	References
California Water Services Co. (CWSC) East Los Angeles (ELA)	12	152,217	12,684.75	9	5	Ref. 33, p.1-5; Ref. 34, p.1-2; Ref. 56, p.65; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
Golden State Water Company (GSWC) - Florence/Graham	8	62,970	7,871.25	4	3	Ref. 33, p.9-11; Ref. 34, p.6-7; Ref. 59, p.32-33; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
South Gate – City Water Department (CWD)	10	76,443	7,644.30	1	1	Ref. 33, p.13; Ref. 34, p.9-10; Ref. 61, p.65; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
Walnut Park Mutual Water Company (MWC)	3	16,180	5,393.33	3	3	Ref. 33, p.15-17; Ref. 34, p.12; Ref. 63, p.1; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
GSWC - Bell, Bell Gardens	7	54,309	7,758.42	6	2	Ref. 33, p.7-8; Ref. 34, p.4-5; Ref. 58, p.33-34, 36-37; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
Maywood MWC #3	3	9,500	3,166.66	3	1	Ref. 33, p.12; Ref. 34, p.8; Ref. 60, p.1; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
Vernon - CWD	10	28,000	2,800.00	9	1	Ref. 33, p.14 Ref. 34, p.11; Ref. 62, p.85; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
Commerce - CWD	3	4,203	1,401.00	2	1	Ref. 33, p.6; Ref. 34, p.3; Ref. 57, p.4; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record

1 = Includes population served by water sources other than groundwater (e.g., imported surface water)

The 17 known drinking water wells within 4 miles of Source 1 that have been identified as having at least some portion of their screening interval consistent with the depths of the Exposition through Jefferson hydrologic unit are shown in the table below (Ref. 33, p.1-17; Ref. 34, p.1-18; see Figures A-6 and A-7 of this HRS documentation record).

Drinking Water Wells Screened in Exposition Through Jefferson Aquifers Within Four Miles					
Well / Purveyor	**No. Screen Intervals**	**Screen Depth (ft bgs)**	**Screen Elevation (ft amsl)**	**Aquifers within Screen Elevation**	**References**
Well 10-03 (CWS-ELA)	1	300 to 480	-138.5 to -318.5	Hollydale	Ref. 27, p.85, 86, 312 ; Ref. 33, p.1
Well 22-01 (CWS-ELA)	5	195 to 978	-31.7 to -814.7	Gage-Gardena, Hollydale, Jefferson, Lynwood, Silverado	Ref. 27, p.77, 80, 85, 86, 87, 88, 89, 91-93, 296, 300, 312 ; Ref. 33, p.2
Well 39-02 (CWS-ELA)	4	310 to 678	Unknown	Hollydale*, Jefferson*, Lynwood*, Silverado*	Ref. 27, p.85, 86, 87, 88, 89, 91, 92, 93, 312, 320, 328, 332, 344, 348; Ref. 33, p.3
Well 62-01 (CWS-ELA)	2	250 to 800	Unknown	Hollydale*, Jefferson*, Lynwood*, Silverado*	Ref. 27, p.85, 86, 87, 88, 89, 91, 92-93, 312, 320, 328, 332; Ref. 33, p.4
Well 62-02 (CWS-ELA)	Unknown	Unknown to 770	Unknown	Jefferson*, Lynwood*	Ref. 27, p.88, 89, 91, 92-93, 320, 328; Ref. 33, p.5
Well 04L (Commerce CWD)	Unknown	Unknown to 412	Unknown	Gage-Gardena*, Hollydale*	Ref. 27, p.77, 80, 296, 300; Ref. 33, p.6
Gage Well 02 (GSWC - BG)	5	290 to 573	-158 to -441	Hollydale, Jefferson, Lynwood	Ref. 27, p.85, 86, 87, 88, 89, 91, 312, 320, 328, 332; Ref. 33, p.7
Watson Well 01 (GSWC - BG)	Unknown	243 to 456	-117.5 to -330.5	Hollydale	Ref. 27, p.85, 86, 312; Ref. 33, p.8
Converse Well 01 (GSWC - FG)	3	296 to 918	-131.96 to -753.96	Hollydale, Jefferson, Lynwood, Silverado	Ref. 27, p.85, 86, 87, 88, 89, 91, 92, 93, 312, 320, 328, 332, 344, 348; Ref. 33, p.9
Goodyear Well 04 (GSWC - FG)	3	502 to 643	-333.9 to -474.9	Jefferson, Lynwood	Ref. 27, p.88, 89, 91, 92, 93, 320, 328; Ref. 33, p.10
Nadeau Well 03 (GSWC - FG)	1	Unknown to 600	Unknown to -456.9	Hollydale*, Jefferson*, Lynwood*	Ref. 27, p.85, 86, 87, 88, 89, 91, 312, 320, 328, 332; Ref. 33, p.11
Well 07 (Maywood MWC #3)	1	340 to 810	Unknown	Hollydale*, Jefferson*, Lynwood*, Silverado*	Ref. 27, p.85, 86, 87, 88, 89, 91, 92, 93, 312, 320, 328, 332, 344, 348; Ref. 33, p.12
Well 28 (South Gate)	1	350 to 1095	Unknown	Jefferson*, Lynwood*, Silverado*, Sunnyside*	Ref. 27, p.88, 89, 91, 93, 95, 96, 320, 328, 332, 344, 348, 360; Ref. 33, p.13
Well 14 (Vernon CWD)	1	360 to 1252	-150 to -1042	Hollydale, Jefferson	Ref. 27, p.85, 86, 87, 88, 312, 320 ; Ref. 33, p.14
Well 10 (Walnut Park MWC)	1	400 to 1564	Unknown	Jefferson*, Lynwood*, Silverado*, Sunnyside*	Ref. 27, p.88, 89, 91, 93, 95, 96, 320, 328, 332, 344, 348, 360; Ref. 33, p.15
Well 11 (Walnut Park MWC)	1	400 to 1440	Unknown	Jefferson*, Lynwood*, Silverado*, Sunnyside*	Ref. 27, p.88, 89, 91, 93, 95, 96, 320, 328, 332, 344, 348, 360; Ref. 33, p.16
Well 12 (Walnut Park MWC)	9	500 to 1240	Unknown	Jefferson*, Lynwood*, Silverado*, Sunnyside*	Ref. 27, p.88, 89, 91, 93, 95, 96, 320, 328, 332, 344, 348, 360; Ref. 33, p.17

* Assumed based on approximate well elevation and/or depth
ft amsl = feet above mean seal level
ft bgs = feet below ground surface
PWS = Public Water System

3.0.1.2 Aquifer Boundaries/Site Geology

Stratum 1: Interconnected Exposition through Jefferson Aquifers

Each stratum in the Central Subbasin is described above in Section 3.0.1. Groundwater flow across the aquifers within both the Los Angeles Forebay and Central Basin Pressure Area have been documented in various locations between the Exposition (and hydrological continuous Gaspur) and the Gage-Gardena aquifers, the Gage-Gardena and Hollydale aquifers, and the Hollydale and Jefferson aquifers (Ref. 27, p.192-195). The State of California, Department of Water Resources' Bulletin No. 104 (Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County) – Appendix A presents "idealized" geologic cross-sections transecting the Central Subbasin. These cross-sections indicate apparent areas of merged aquifers throughout much of the subbasin. Aquifer interconnection within 2 miles of Source 1 has been documented between the Exposition through Jefferson aquifers. As such, these two aquifers, as well as the intervening Gage- Gardena and Hollydale aquifers, are considered to be a single hydrologic unit for HRS purposes (Ref. 7, p.42, 43; Ref. 27, p.232, 248, 280, 284, 296, 300, 312, 316, 320, 324, 384, 388, 392, 396).

3.0.1.1.1 Aquifer Interconnections

Interconnections between the Exposition aquifer and contemporaneous Gage and Gardena aquifers have been documented approximately 1.4 miles east of Source 1 (Ref. 27, p. 75-77, 193, 232, 248, 280, 284, 296, 300). Interconnections between the merged Exposition/Gage-Gardena aquifer and Hollydale aquifer have been documented approximately 1.65 miles northwest of Source 1 (Ref. 27, p.85, 193-194, 248, 280, 284, 296, 300, 312, 316). Interconnections between the merged Exposition/Gage-Gardena/Hollydale aquifer and Jefferson aquifer have been documented approximately 1.95 miles northwest of Source 1 (Ref. 27, p.88, 193-194, 248, 280, 284, 296, 300, 312, 316, 320, 324).

Elevated concentrations of TCE have been documented in groundwater collected from wells screened in the aforementioned aquifers within 2 miles of Source 1, further indicating the interconnection. In addition to monitoring wells in the vicinity of Source 1 used to establish the observed release to the Exposition aquifer, TCE has been detected from the following drinking water wells within 2 miles:

Elevated TCE Concentrations in Drinking Water Wells within Two Miles of Source 1						
Well / Purveyor	**Distance to Source 1 (miles)**	**Screen Elevation (ft amsl)**	**Screened Aquifers[1]**	**Maximum TCE (µg/L)**	**Recent TCE (µg/L)**	**References**
Well 10-03 (CWSC-ELA)	1.05 East	-138.5 to -318.5	Hollydale	1.7 (4/2021)	0.8 (12/2023)	Ref. 33, p.1; Ref. 35, p.1-4; Figure A-6 of this HRS Documentation Record
Well 22-01 (CWSC-ELA)	1.48 East-Northeast	-31.7 to -814.7	Gage-Gardena, Hollydale, Jefferson	2.5 (3/1994)	1.6 (12/2023)	Ref. 33, p.2; Ref. 35, p.5-8 Figure A-6 of this HRS Documentation Record
Well 39-02 (CWSC-ELA)	1.29 East-Northeast	-160 to -528*	Hollydale, Jefferson	1.4 (1/2023)	1.2 (10/2023)	Ref. 33, p.3; Ref. 35, p.9-12 Figure A-6 of this HRS Documentation Record
Well 07 (Maywood MWC #3)	1.52 Southwest	-190 to -660*	Hollydale, Jefferson	5.6 (10/2011)	2.7 (12/2023)	Ref. 33, p.12; Ref. 35, p.41-42 Figure A-6 of this HRS Documentation Record

1 = At depths described in Section 3.0.1 of this HRS Documentation Record
TCE = Trichloroethylene
ft bgs = feet below ground surface
µg/L = micrograms per Liter
* Estimated based on known well depth and assumed well elevation

3.0.1.1.2 Aquifer Discontinuities

An aquifer discontinuity occurs for scoring purposes only when a geologic, topographic, or other structure or feature entirely transects an aquifer within the 4-mile target distance limit, thereby creating a continuous boundary to groundwater flow within this limit (Ref. 1, Section 3.0.1.2.2).

There are no known or suspected discontinuities within the Exposition, Gage-Gardena, or Jefferson aquifers within 4 miles of Source 1, based on historic aquifer elevation maps and cross-sections (Ref. 27, p.232, 248, 280, 284, 296, 300, 320, 324).

The Hollydale aquifer has been reported to be potentially discontinuous in extent, where historic aquifer elevation maps have shown sinuous irregular courses of the aquifer within the Central Basin, including an area from approximately 1.4 miles to 1.9 miles, and 2.8 miles to 4.0 miles southeast of Source 1, where the aquifer elevations have not been sufficiently documented (Ref. 27, p.85, 248, 312, 316; Figure A-7 of this HRS Documentation Record).

For the purposes of this HRS Documentation Record, the Exposition aquifer beneath the Exide-Vernon facility is defined as being between 95 ft bgs and 175 ft bgs; which is based on the data reported in the 2021 Groundwater Monitoring Report (Ref. 22, p.10). Water-bearing units identified at shallower depths are defined as being associated with one or more perched (or semi-perched) aquifers. During historical on-site investigations, discontinuous zones of saturated soils were identified at depths between approximately 73 ft bgs and 90 ft bgs. These depths are consistent with the lower portion of the generally fine-grained unit that is commonly referred to as the Bellflower aquitard (or aquiclude) (Ref. 22, p.10).

There are currently 24 on-property and four off-property wells that are regularly monitored within the “perched zone” and 10 on-site and five off-site wells that are regularly monitored within the Exposition aquifer. Declining water levels have been observed within both zones and, since 2019, ten of the “perched” wells and four of the “Exposition” wells have been documented as dry. Due to the discontinuous nature of the “perched” zones across the facility, it is not meaningful to calculate a generalized flow direction; however, the flow direction of the Exposition aquifer beneath the facility has been calculated as being towards the southwest during the October 2023 SI groundwater sampling event (Ref. 7, p.43; Ref. 22, p.10).

Summary of Aquifer Being Evaluated

Hydrologic Unit	Aquifer No.	Aquifer Name	Is Aquifer Interconnected with Upper Aquifer within 2 miles? (Y/N/NA)	Is Aquifer Continuous within 4-mile TDL? (Y/N)	Is Aquifer Karst? (Y/N)
Exposition thru Jefferson	1a	Exposition	Y	Y	N
	1b	Gage-Gardena	Y	Y	N
	1c	Hollydale	Y	N[1]	N
	1d	Jefferson	Y	Y	N

1 = The Hollydale aquifer has been reported to be potentially discontinuous in extent where the aquifer elevations have not been sufficiently documented

3.1 LIKELIHOOD OF RELEASE

3.1.1 OBSERVED RELEASE

Aquifer Being Evaluated: Exposition through Jefferson Hydrologic Unit

Observed Release by Chemical Analysis

The minimum standard to establish an observed release by chemical analysis is analytical evidence of a hazardous substance significantly above the background level and some portion of the significant increase above the background level is attributable to the site. In accordance with HRS Table 2-3, if the background concentration is not detected, a significant increase is established when the sample measurement equals or exceeds the sample quantitation limit (SQL). If the background concentration equals or exceeds the detection limit, a significant increase is established when the sample measurement is 3 times or more above the background concentration. If the sample analysis was performed under the EPA Contract Laboratory Program (CLP), the EPA contract-required quantitation limit (CRQL) can be used in place of the SQL if the SQL is not available (Ref. 1, Section 2.3).

As shown in the table below and Figure A-5 of this HRS documentation record, on-site monitoring wells screened in the perched zone have been regularly sampled since 1986, and monitoring wells screened in the Exposition aquifer have been regularly sampled since 2015. TCE has been detected above EPA Maximum Contaminant Levels (MCLs) in monitoring wells screened within the perched zone beneath SWMU-11 (Source 1), and the Exposition aquifer immediately downgradient of SWMU-11 (See Section 2.2.2 of this HRS Documentation Record and the SWMU-11 Perched Zone Groundwater Sampling Result Summary and Downgradient Release Well and Background Well Sampling Results Tables in this section).

SWMU-11 (Source 1) Perched Zone Monitoring Wells

As shown in the table below and Figure A-5 of this HRS Documentation Record, two monitoring wells (PW-2 and MW-14) installed beneath SWMU-11 and one well immediately downgradient of SWMU-11 (MW-11) have been sampled since 1987. The maximum documented TCE concentration of 5,500 microgram per Liter (µg/L) was observed at PW-2 in August 2000 (Ref. 9, p.143). The maximum documented TCE concentration of 2,500 µg/L was observed at MW-14 in May 1999 (Ref. 9, p.141, 144; Figure A-5 of this HRS Documentation Record). The maximum documented TCE concentration of 2,500 µg/L was observed at MW-11 in September 1999 (Ref. 9, p.138).

Due to the discontinuous nature of the perched zone across the Exide-Vernon facility, there are no suitable monitoring wells to represent background concentrations in the perched zone, however TCE results from the nearest “upgradient” well, MW-12, and “downgradient” well, MW-11, are discussed to provide supplemental and contextual information to confirm the presence and extent of Source 1.

Between 1996 and 2005, TCE concentrations in “upgradient” perched zone monitoring well MW-12 were regularly below the MCL and/or laboratory reporting limits, with a maximum concentration of 74 µg/L observed in 2001 (Ref. 9, p. 139). TCE concentrations up to 2,500 µg/L were observed in "downgradient" perched zone monitoring well MW-11 in 1999 prior to the well going dry (Ref. 11, p. 85; Ref. 9, p.138).

The table below shows the maximum historical maximum TCE concentrations, as well as concentrations from the three most recent sampling events at the Source 1 area perched zone wells.

SWMU-11 Perched Zone Groundwater Sampling Result Summary					
Well ID	**Sampling Occurrence**	**Sample Date**	**TCE Result[1] (µg/L)**	**MDL (µg/L)**	**References**
Source 1 Monitoring Wells (Perched Zone)					
PW-2	Historic Maximum	8/25/2000	5500	--	Ref. 9, p.144
	2019 4Q GW Monitoring	12/18/2019	190	0.5	Ref. 17, p.15, 21, 2056; Ref. 18, p.14; Ref. 19, p.52, 161
	2021 GW Monitoring	--	--	--	--
	2023 TCE Concentration	--	--	--	--
MW-14	Historic Maximum	5/25/1999	2500	--	Ref. 9, p.141
	2019 4Q GW Monitoring	--	--	--	--
	2021 GW Monitoring	9/29/2021	360 500[d]	2.9 / 5.8	Ref. 20, p.11, 19, 1721; Ref. 22, p.46, 125
	2023 SI Sampling	10/25/2023	200	1.5	Ref. 23, p.10, 21, 2922; Ref. 7, p.89; Ref. 14, p.6
Upgradient of Source 1 Monitoring Well (Perched Zone)					
MW-12	Historic Maximum	3/13/2001	74	--	Ref. 9, p.139
	2019 4Q GW Monitoring	12/16/2019	0.94 J	0.25	Ref. 36, p.10, 18, 980; Ref. 19, p.52, 124-125
	2021 GW Monitoring	9/28/2021	0.54 J	0.29	Ref. 25, p.11, 18, 1716; Ref. 22, p.46, 122
	2023 TCE Concentration	10/25/2023	5	0.39	Ref. 23, p.10, 23, 2922; Ref. 7, p.89; Ref. 14, p.4
Downgradient of Source 1 Monitoring Well (Perched Zone)					
MW-11	Historic Maximum	9/3/1999	2500	--	Ref. 9, p.138
	2019 4Q GW Monitoring	--	--	--	
	2021 GW Monitoring	--	--	--	
	2023 SI Sampling	--	--	--	

TCE = Trichloroethylene
MDL = Method Detection Limit (For HRS purposes, the MDL is the equivalent of a Detection Limit, defined as the lowest amount that can be distinguished from the normal random ''noise'' of an analytical instrument or method)
J = Result is less than Reporting Limit but greater than MDL and is approximated
U = Analyte not detected above MDL
d = duplicate samples
µg/L = microgram per Liter
1 = Samples analyzed via EPA Method 8260B

Observed Release to Exposition Aquifer Monitoring Wells

Background Exposition Aquifer Monitoring Well

In order to establish an observed release by chemical analysis in accordance with the HRS, an appropriate background well was selected that was hydrologically upgradient of Source 1, with a similar depth, screening interval, and construction of the contaminated release well downgradient of SWMNU-11 (Source 1). Monitoring well MW-12D, screened within the Exposition aquifer, is located upgradient of SWMU-11 and was identified as an ideal background well candidate. As shown on the table below, MW-12D has a similar depth, screened interval, and construction as downgradient release well MW-11D (Ref. 11, p.225-232, 233-241; Ref.7, p.82).

Background Well and Downgradient Release Well Construction and Groundwater Elevations							
Well ID	**Top of Casing Elevation (ft amsl)**	**Screened Interval**		**Groundwater Elevation**		**Elevation Measurement Date**	**References**
		ft amsl	**ft bgs**	**ft amsl**	**ft bgs**		
Background / Upgradient Monitoring Well (Exposition Aquifer)							
MW-12D	173.25	36.25 to 16.25	137.0 to 157.0	22.24	151.01	10/24/2023	Ref. 11, p. 233-241; Ref.7, p.29, 80
Downgradient Release Monitoring Well (Exposition Aquifer)							
MW-11D	174.06	32.06 to 17.06	142.0 to 157.0	21.32	152.74	10/24/2023	Ref. 11, p. 225-232; Ref.7, p.29, 80
ft amsl = feet above mean sea level ft bgs = feet below ground surface							

Since construction in 2015, MW-12D has been sampled a total of 20 times concurrently with downgradient release well MW-11D, with TCE concentrations ranging from 2.7 µg/L to 22 µg/L (See table below).

Exposition Aquifer Monitoring Well Establishing an Observed Release

TCE in Exposition aquifer monitoring well MW-11D located immediately downgradient of SWMU-11 (Source 1) has been observed with concentrations of 200 µg/L (Ref. 38, p. 35). As shown on the table below, TCE concentrations in MW-11D have consistently been significantly greater than concentrations in background well MW-12D. As recently as September 2021, TCE was reported in a duplicate sample from MW-11D at a concentration of 47 µg/L, which is considered significantly above (three times) background based on the result of 15 µg/L collected from well MW-12D during the same sampling event (Ref. 20, p.41; Ref. 25, p.14, 44, 46; Ref. 22, p.47). The historical TCE concentrations at MW-11D have been consistently significantly greater than concentrations at immediately upgradient well MW-12D, indicating a localized on-site TCE source beneath SWMU-11 impacting groundwater in the Exposition aquifer, separate from other potential on-site and off-site sources.

Downgradient Release Well Sampling Results Exceeding Background

Sample Date	TCE Result[1] (µg/L)				References
	MW-11D Downgradient Release Well	MW-12D Background Well	3 x Background	MDL	
12/2015	**180**	12	42	1.8, 0.37	Ref. 38, p.35, 129, 131, 831, 887, 1012, 1013, 1055
6/2016	**72/120***	12	36	0.37/0.37, 0.37	Ref. 40, p.23, 119, 122, 597, 598, 639, 708, 709, 710, 711, 746
12/2016	**96**	10	30	0.37, 0.37	Ref. 42, p.28, 254, 256-257, 770, 771, 811, 1000, 1001, 1046
6/2017	**74**	13	39	0.25, 0.25	Ref. 44, p.37, 96, 98, 477, 507, 673, 713
9/2017	**75/78***	16	48	0.25/0.25, 0.25	Ref. 45, p.41, 100, 103, 745, 790, 800, 801, 862
9/2018	**35**	7.6/7.9*	23.7	0.25, 0.25/0.25	Ref. 49, p.44, 117-118, 346, 426, 456, 457, 458, 540
12/2018	30/**39***	12	36	0.25/0.25, 0.25	Ref. 50, p.64, 128, 130, 367, 369, 371, 445
6/2019	**12**	2.7	8.1	0.25, 0.25	Ref. 52, p.48, 134-135, 323, 328, 404
9/2019	**20**	17	51	0.25, 0.25	Ref. 53, p.37, 96-97, 295, 307, 367-368
12/2019	**38**	11	33	0.25, 0.25	Ref. 17, p.17, 37, 44; Ref. 18, p.17, 20; Ref. 19, p.52, 140-141
9/2021	**46/47***	15	45	0.29/0.25, 0.29	Ref. 20, p.11, 41; Ref. 21, p.19; Ref. 25, p.14, 15, 44, 46; Ref. 26, p.15; Ref. 22, p.47, 121, 123

1 = Samples analyzed via EPA Method 8260B
TCE = Trichloroethylene
MDL = Method Detection Limit (For HRS purposes, the MDL is the equivalent of a Detection Limit, defined as the lowest amount that can be distinguished from the normal random ''noise'' of an analytical instrument or method) (Ref. 1, Section 1.1; Ref. p. 17, p. 37; Ref. 18, pp. 17, 20; Ref. 20, pp. 11, 41; Ref. 25, pp. 14, 44, 46; Ref. 38, pp. 831, 1012; Ref. 40, pp.597, 598, 708-711; Ref. 42, pp. 770, 771, 1000, 1001; Ref. 44, pp. 477, 673; Ref. 45, pp. 745, 800; Ref. 49, pp. 346, 456, Ref. 50, p. 367, 369, 371; Ref. 52, pp. 323, 328; Ref. 53, pp. 295, 307)

µg/L = micrograms per Liter
Bold = Downgradient result is greater than 3 x background result
*** =** Result from duplicate sample

Attribution

TCE has been detected in groundwater within Source 1 (SWMU-11) at concentrations greater than three times the background level (Figure A-5 of this HRS documentation record; Ref. 20, p.11, 41; Ref. 21, p.19; Ref. 25, p.14, 44, 46; Ref. 26, p.15; Ref. 22, p.47, 121, 123).

As documented in the 1990 RFA, TCE was used as a cooling medium where it was poured into an open storage vat during the metals extrusion process where releases reportedly occurred throughout the lifespan of the unit. Based on current conditions and previous environmental investigations, it is believed that the contamination found beneath SWMU-11 originated from surface releases of TCE (Ref. 8, p.6, 44; Ref. 9, p.34; Ref. 10, p.313-316; Ref. 11, p.85; Ref. 12, p.12).

Soil and soil vapor samples collected from SWMU-11 indicated elevated concentrations of TCE in soil to a depth of 70 feet bgs, and in soil vapor to a depth of 68 feet bgs (Ref. 9, p.92; Ref. 12, p.35-37). A dissolved phase fraction entered the groundwater and began to slowly migrate south-southeast with the hydraulic gradient. Based on the geology underlying SWMU-11, it appears that upon release, the TCE migrated vertically through approximately 75 feet of unsaturated sediments over time (Ref. 12, p.12).

As discussed in Section 2.2.2 and shown on Figure A-5 of this HRS documentation record, two monitoring wells (PW-2 and MW-14) installed beneath SWMU-11 and one well immediately downgradient of SWMU-11 (MW-11) have been sampled since 1996. The maximum documented TCE concentration of 5,500 µg/L was observed at PW-2 in August 2000 (Ref. 9, pp. 138, 141, 144). The maximum documented TCE concentration of 2,500 µg/L was observed at MW-14 in May 1999 (Ref. 9, p. 141). The maximum documented TCE concentration of 2,500 µg/L was observed at MW-11 in September 1999 (Ref. 9, p. 138).

An Exposition aquifer monitoring well (MW-11D) immediately downgradient of SWMU-11 has been sampled since 2015, with a maximum TCE concentration of 200 µg/L observed in December 2015 (Ref. 11, p. 146; Ref. 38, p. 35). An Exposition aquifer monitoring well (MW-12D) immediately upgradient of SWMU-11 has been sampled since 2015, with a maximum TCE concentration of 22 µg/L observed in was observed in March 2018 (Ref. 47, p. 43).

As discussed above, on-site sampling results collected in September 2021 were used to establish an observed release of TCE to the Exposition aquifer. TCE was reported in a duplicate sample from MW-11D at a concentration of 47 µg/L, which is considered significantly above (three times) background based on the result of 15 µg/L collected from well MW-12D during the same sampling event (Ref. 20, p. 41, 18; Ref. 25, pp. 14, 44, 46; Ref. 22, p. 47).

The historical TCE concentrations at MW-11D have been consistently greater than concentrations at immediately upgradient well MW-12D, indicating a localized on-site TCE source beneath SWMU-11 impacting groundwater in the Exposition aquifer, separate from other on-site and off-site sources potentially contributing to the TCE levels found in on-site wells. At least 10 known groundwater monitoring wells are located immediately adjacent to the Site. These include nearby eight Exposition aquifer wells associated with the former Honeywell Bandini site (now Baker Commodities) immediately east of the Exide Technologies – Vernon site, and two Exposition aquifer wells associated with the former Univar Solutions USA facility, located approximately 0.75 miles northeast of the Exide Technologies – Vernon site (Ref. 11, p.87-89, 98, 99; Ref 22 p.19, 66; Ref. 54, p.37; Ref. 55, p.35).

Former Honeywell Bandini Site (now Baker Commodities)
4037 Bandini Boulevard, Vernon, California
DTSC EnviroStor ID 19340780

The former Honeywell Bandini site (now Baker Commodities) is situated immediately east of the Exide Technologies – Vernon facility and operated as a metals forming manufacturer from 1951 to 2002. Since 2002, the property has been used for storage and office space. Numerous investigations conducted since 1996 have identified TCE and other VOCs in groundwater, soil, and soil vapor, with the highest TCE concentrations found level within the northern portion of the property. Based on groundwater flow direction and historic sampling results, the TCE detected from the Honeywell Bandini source wells do not appear to be a major contributing factor to the observed release at SWMU-11 within the Exide Technologies – Vernon facility (Ref. 11, pp.88, 89; Ref. 54 pp.7-8, 13, 37; Ref. 74, p.1).

Former Univar Solutions USA Inc. Facility
4256 Noakes Street, Commerce, California
DTSC EnviroStor ID 80001627

The former Univar Solutions USA facility located approximately 0.75 miles northeast of the Exide Technologies – Vernon facility operated as a chemical distribution, blending, and recycling facility from 1954 through 2000. Historical operations at the facility have impacted soil and groundwater with volatile organic compounds (VOCs), including TCE. Subsurface investigations have been conducted beginning in 1985 to delineate the extent and nature of the contamination. TCE originating from the former Univar Solutions facility has likely contributed in part to elevated TCE concentrations at the Exide Technologies - Vernon facility, as observed in MW-12D (Ref. 11, pp.88, 98, 99; Ref. 55, pp.8, 12, 41; Ref. 74, p.1)

TCE was reported in the five Honeywell Bandini monitoring wells sampled in December 2021 at concentrations ranging from 28 µg/L to 140 µg/L, all of which are hydraulically cross-gradient from the Exide Technologies – Vernon facility (Ref. 54 p. 13, 14, 25-26, 37, 39). TCE was reported in the nearest Univar Solutions monitoring well in June 2021 at concentrations of 85 µg/L and 430 (estimated) µg/L, hydraulically up-gradient from the Exide Technologies – Vernon facility (Ref. 55, p.41, 44, 77; Ref. 74, p.1).

TCE contamination originating from the off-site former Honeywell Bandini and former Univar Solutions sources are potentially contributing to TCE levels found in the Exide Technologies – Vernon monitoring wells, as seen in the consistent historic levels documented in background well MW-12D; however, the documented TCE release at SWMU-11 (Source 1) appears to be impacting downgradient well MW-11D at levels significantly greater than concentrations migrating from off-site sources.

3.1.2 POTENTIAL TO RELEASE

Potential to Release was not scored, because an Observed Release was established.

3.2 WASTE CHARACTERISTICS

The waste characteristics category value is based on hazardous waste quantity, toxicity, and groundwater mobility for the hazardous substances documented in the site source in the release to groundwater.

3.2.1 TOXICITY/MOBILITY

HRS Toxicity and Mobility Factor Values are presented below for the hazardous substances documented in Source 1. Toxicity Factor Values are provided in the Superfund Chemical Data Matrix (Ref. 2).

Hazardous Substance	Source No.	Toxicity Factor Value	Mobility Factor Value	Does Haz. Substance Meet Observed Release? (Y/N)	Toxicity/ Mobility (Table 3-9)	Reference
TCE	1	1,000	1*	Y	1,000	Ref. 2, p. 2

* Hazardous substances meeting the criteria for observed release by chemical analysis receive a mobility factor value of 1 (Ref. 1, section 3.2.1.2).

Toxicity/Mobility Factor Value: 1,000
(Ref. 1, Table 3-9, Section 2.4.1.1)

3.2.2 HAZARDOUS WASTE QUANTITY

The calculation for hazardous waste quantity for Source 1 is presented in Section 2.4.2.

Source No.	Source Type	Source Hazardous Waste Quantity
1	Contaminated Soil	>0
	sum:	1 (rounded to 1 as specified in Ref. 1, Table 2-6)

The exact area for Source 1 could not be adequately determined according to the HRS requirements (Ref. 1, Section 2.4.2.1.4). Subsurface soil samples located within SWMU-11 contained TCE at concentrations significantly above background (see Section 2.2.2 of this document). However, the area of contaminated soil at SWMU-11 (Source 1) could not be adequately determined based on soil sampling conducted. Therefore, as the area cannot be determined with reasonable confidence, the area measure value of >0 is assigned.

Hazardous Waste Quantity Factor Value: 10
(Ref. 1, Section 2.4.2.2)

3.2.3 WASTE CHARACTERISTICS FACTOR CATEGORY VALUE

Toxicity/Mobility Factor Value: 1,000 Hazardous Waste Quantity Factor Value: 10

Toxicity/Mobility Factor Value X Hazardous Waste Quantity Factor Value: 10,000

Waste Characteristics Factor Category Value (subject to a maximum of 100): 10
(Ref. 1, Table 2-7, Section 2.4.3)

3.3 TARGETS

Drinking water wells screened in the Exposition through Jefferson hydrologic unit within the target distance limit from Source 1 are shown on Figure A-6 of this HRS documentation record.

3.3.1 NEAREST WELL

The nearest HRS-eligible drinking water well to Source 1 that is screened within the Exposition through Jefferson hydrologic unit is Well 10-03, which is located approximately 1.1 mile east of Source 1. This well is owned and operated by the California Water Service's East Los Angeles District and is screened between 300 ft bgs and 480 ft bgs. TCE was identified in this well at a concentration of 0.8 µg/L during the most recent water quality sampling event in December 2023. The maximum TCE concentration of 1.7 µg/L was reported from this well in April 2021. In accordance with HRS Table 3-11, a Nearest Well Factor Value of 5 is assigned. (Ref. 33, p.1; Ref. 35, p.1-8).

Nearest Well Factor Value: 5
(Ref. 1, Table 3-11)

3.3.2 POPULATION

There are 52 known active drinking water wells within 4 miles of Source 1 (Ref. 15, p.1; Figure A-6 of this HRS documentation record). These wells, which are operated by 14 distinct water purveyors, serve an estimated apportioned population of 306,890.50. Of these 52 wells, 17 wells operated by eight purveyors were identified as having at least some portion of their screening interval consistent with the depths of the Exposition through Jefferson hydrologic unit, which serves an estimated population of 133,746.29, as shown in the table below (Ref. 33, p.1-17; Ref. 34, p.1-18; Ref. 15, p.1; Fig A-6 of this HRS Documentation Record).

Water purveyors operating active drinking water wells within the TDL include the following:

<u>California Water Services - East Los Angeles</u>

The California Water Services (CWSC) East Los Angeles (ELA) district operates a drinking water system that serves a population of approximately 152,217 and includes 11 active wells and no known standby wells (Ref. 34, p.1-2). The district obtains approximately 72.2% of its drinking water from groundwater, the remaining 27.7% is composed of imported surface water and/or recycled water (Ref. 56, p.65). No individual well or intake exceeds 40% of the annual pumpage or capacity for the district (Ref. 69, p.1-5). Nine of the 11 active wells maintained by the district are located within 4 miles of Source 1; however, only five of these wells (Well 10-03, Well 22-01, Well 39-02, Well 62-01, and Well 62-02) are reported to potentially have screening intervals at depths consistent with the Exposition through Jefferson hydrologic unit (Ref. 33, p.1-5; Ref. 15, p.1; Fig A-6 of this HRS Documentation Record).

Calculation: 152,217 people/(11 wells + 1 surface water intake) = 12,684.75 people per well.

Golden State Water Company - Bell/Bell Gardens

The Golden State Water Company (GSWC) Bell/Bell Gardens district operates a drinking water system that serves a population of approximately 54,309 and includes six active wells and no known standby wells (Ref. 34, p.4-5). The district obtains approximately 96% of its drinking water from groundwater. The remaining 4% is composed of imported surface water and/or recycled water (Ref. 58, p.33, 36-37). No individual well or intake exceeds 40% of the annual pumpage or capacity for the district (Ref. 69, p.12-18). All six of the active wells maintained by the district are located within 4 miles of Source 1; however, only two of these wells (Watson Well 01 and Gage Well 02) are reported to have screening intervals at depths consistent with the Exposition through Jefferson hydrologic unit (Ref. 33, pp. 7-8, 16-21; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record)

Calculation: 54,309 people/(6 wells + 1 surface water intake) = 7,758.43 people per well.

Vernon – City Water Department

The Vernon – City Water Department (CWD) operates a drinking water system that serves a population of approximately 28,000 and includes nine active wells, including one standby well (Ref. 34, p.11). Standby Well No. 14 is maintained and activated on a regular basis (Ref. 68, p.27-28). The district obtains approximately 82% of its drinking water from groundwater. The remaining 18% is composed of imported surface water and/or recycled water (Ref. 62, p.85). No individual well or intake exceeds 40% of the annual pumpage or capacity for the district (Ref. 69, p.30-32). All nine active wells maintained by the department are located within 4 miles of Source 1; however, only one of these wells (Standby Well No. 14) is reported to have a screening interval at depths consistent with the Exposition through Jefferson hydrologic unit (Ref. 33, p.14 Ref. 15, p.1; Fig A-6 of this HRS Doc. Record).

Calculation: 28,000 people/(9 wells + 1 surface water intake) = 2,800.00 people per well.

Maywood Mutual Water Company #3

Maywood Mutual Water Company (MWC) #3 operates a drinking water system that serves a population of approximately 9,500 and includes three active wells and no known standby wells (Ref. 34, p.8). The purveyor obtains 100% of its drinking water from groundwater; however, it does maintain a connection with the Metropolitan Water District (MWD) for an emergency supply (Ref. 60, p.1). No individual well or intake exceeds 40% of the annual pumpage or capacity for the district (Ref. 69, p.21-22). All three of the active wells maintained by the purveyor are located within 4 miles of Source 1; however only one of these wells (Warehouse Well 07) is reported to have screening intervals at depths consistent with the Exposition through Jefferson hydrologic unit (Ref. 33, p.12; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record).

Calculation: 9,500 people/(3 wells) = 3,166.67 people per well.

Walnut Park Mutual Water Company

The Walnut Park MWC operates a drinking water system that serves a population of approximately 16,180 and includes three active wells and no known standby wells (Ref. 34, p.12). The purveyor obtains 100% of its drinking water from groundwater; however, it does maintain a connection with the MWD for an emergency supply (Ref. 63, p.1). One well (Well 11) is responsible for approximately 52% of the annual pumpage or for the district (Ref. 69, p.35-36). All three of the active wells maintained by the purveyor (Well 10, Well 11, and Well 12) are located within 4 miles of Source 1 and are all reported to have screening intervals at depths consistent with the Exposition through Jefferson hydrologic unit (Ref. 33, p.15-17).

Calculation: Well 11: 16,180 people x 0.52 (52%) = 8,413.6 people
Well 10: 16,180 people x 0.24 (24%) = 3,883.2 people
Well 12: 16,180 people x 0.24 (24%) = 3,883.2 people

Golden State Water Company - Florence/Graham

The GSWC [formerly the SCWC], Florence/Graham district operates a drinking water system that serves a population of approximately 62,970 and includes seven active wells and no known standby wells (Ref. 34, p.6-7). The district obtains approximately 98% of its drinking water from groundwater, the remaining 2% is composed of imported surface water and/or recycled water (Ref. 59, p.32, 35). No individual well or intake exceeds 40% of the annual pumpage or capacity for the district (Ref. 69, p.12-18). Four of the seven of the active wells maintained by the district are located within 4 miles of Source 1; however, only three of these wells (Converse Well 01, Nadeau Well 03, Goodyear Well 04) are reported to have screening intervals at depths consistent with the Exposition through Jefferson hydrologic unit (Ref. 33, p.9-11).

Calculation: 62,970 people/(7 wells + 1 surface water intake) = 7,871.25 people per well.

Commerce - City Water Department

The Commerce - CWD operates a drinking water system that serves a population of approximately 4,203 and includes two active wells, and no known standby wells (Ref. 34, p.3). The district obtains approximately 66.7% of its drinking water from groundwater, the remaining 33.3% is composed of purchased surface water and/or recycled water (Ref. 57, p.4). No individual well or intake exceeds 40% of the annual pumpage or capacity for the district (Ref. 69, p.8-9). Both active wells maintained by the department are located within 4 miles of Source 1; however, only one of these wells (Well 04L) is reported to have a screening interval at depths consistent with the Exposition through Jefferson hydrologic unit (Ref. 33, p.6).

Calculation: 4,203 people/(2 wells + 1 surface water intake) = 1,401.00 people per well.

South Gate – City Water Department

The South Gate CWD operates a drinking water system that serves a population of approximately 76,443 and includes ten active wells, and no known standby wells (Ref. 34, p.9). The purveyor obtains 97.1% of its drinking water from groundwater, with the remaining 2.9% composed of recycled surface water (Ref. 62, p.85). The department also maintains a connection with the MWD for an emergency supply. No individual well or intake exceeds 40% of the annual pumpage or capacity for the district (Ref. 69, p.25-27). Only one active well maintained by the department is located within 4 miles of Source 1; this well (Well 28) is reported to have a screening interval at a depth consistent with the Exposition through Jefferson hydrologic unit (Ref. 33, p.13).

Calculation: 76,443 people/10 wells = 7,644.30 people per well.

Additional water purveyors operating active drinking water wells within the 4-mile TDL were identified, however they do not have screening intervals consistent with the Exposition through Jefferson hydrologic unit, as shown in the following table:

Water Purveyors Operating Active Wells/Intakes Screened Within the Exposition to Jefferson Hydrologic Unit Within the Four-Mile Target Distance Limit

Water Company Name	No. of Wells / Intakes in System	Total Population Served (1)	Population per Well	No. of Wells Within 4 Miles	No. of Wells Screened in Exposition - Jefferson Hydrologic Unit	References
California Water Services (CWSC) East Los Angeles (ELA)	12	152,217	12,684.75	9	5	Ref. 34, p.1-2; Ref. 56, p.65; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
Golden State Water Company (GSWC) - Florence/Graham	8	62,970	7,871.25	4	3	Ref. 34, p.6-7; Ref. 59, p.32-33; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
South Gate – City Water Department (CWD)	10	76,443	7,644.30	1	1	Ref. 34, p.9-10; Ref. 61, p.65; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
Walnut Park Mutual Water Company (MWC)	3	16,180	8,413.6 (x1) 3,883.2 (x2)	3	3	Ref. 34, p.12; Ref. 63, p.1; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
GSWC - Bell, Bell Gardens	7	54,309	7,758.42	6	2	Ref. 34, p.4-5; Ref. 58, p.33-34, 36-37; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
Maywood MWC #3	3	9,500	3,166.66	3	1	Ref. 34, p.8; Ref. 60, p.1; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
Vernon - CWD	10	28,000	2,800.00	9	1	Ref. 34, p.11; Ref. 62, p.85; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record
Commerce - CWD	3	4,203	1,401.00	2	1	Ref. 34, p.3; Ref. 57, p.4; Ref. 15, p.1; Fig A-6 of this HRS Doc. Record

1 = Includes population served by water sources other than groundwater (e.g., imported surface water)

3.3.2.1 Level of Contamination

3.3.2.2 Level I Concentrations

Level I actual contamination is documented when groundwater concentrations for the target meet the criteria for an observed release and are at or above groundwater benchmark values (Ref. 1, Section 2.5; Ref. 1, Table 3-10). As identified in Section 3.3, no drinking water wells are subject to Level I concentrations.

Level I Concentrations Factor Value: 0

3.3.2.3 Level II Concentrations

Level II actual contamination is documented when groundwater concentrations for the target meet the criteria for an observed release and are at or above groundwater benchmark values (Ref. 1, Section 2.5; Ref. 1, Table 3-10). As identified in Section 3.3, no drinking water wells are subject to Level II concentrations.

Level II Concentrations Factor Value: 0

3.3.2.4 Potential Contamination

The populations assigned to the wells are explained in Section 3.3.2 of this document. Groundwater apportionment calculations are presented below. A Population Factor Value of 1,423.40 is assigned, in accordance with HRS Section 3.3.2.4 and Table 3-12.

Groundwater Apportionment Calculations				
Distance Category (miles)	**Public and Private Wells**	**Population Served**	**Reference**	**Distance-Weighted Population Value (Ref. 1, Table 3-12)**
0 to -¼	**Total**	**0**		**0**
> ¼ to ½	**Total**	**0**		**0**
> ½ to 1	**Total**	**0**		**0**
> 1 to 2	**Total**	**44,020.92**		**9,385.00**
	CWSC-ELA: Well 10-03	12,684.75	Ref. 33, p.1; Ref. 34, p.1-2	
	CWSC-ELA: Well 39-02	12,684.75	Ref. 33, p.3; Ref. 34, p.1-2	
	CWSC-ELA: Well 22-01	12,684.75	Ref. 33, p.2; Ref. 34, p.1-2	
	Vernon CWD: Well 14	2,800.00	Ref. 33, p.14; Ref. 34, p.11	
	Maywood MWC: Well 07	3,166.67	Ref. 33, p.12; Ref. 34, p.8	
> 2 to 3	**Total**	**7,758.43**		**678.00**
	GSWC - Bell/Bell Gardens: Watson Well 01	7,758.43	Ref. 33, p. 8; Ref. 34, p. 4-5	
> 3 to 4	**Total**	**82,677.48**		**4,171.00**
	CWSC-ELA: Well 62-01	12,684.75	Ref. 33, p. 4; Ref. 34, p.1-2	
	CWSC-ELA: Well 62-02	12,684.75	Ref. 33, p. 5; Ref. 34, p.1-2	
	Commerce CWD: Well 04L	1,401.00	Ref. 33, p. 6; Ref. 34, p.3	
	GSWC - Bell/Bell Gardens: Gage Well 02	7,758.43	Ref. 33, p. 7; Ref. 34, p. 4-5	
	Walnut Park MWC: Well 10	3,883.2	Ref. 33, p. 15; Ref. 34, p.12; Ref. 69, p.35-36	
	Walnut Park MWC: Well 11	8,413.6	Ref. 33, p. 16; Ref. 34, p.12; Ref. 69, p.35-36	
	Walnut Park MWC: Well 12	3,883.2	Ref. 33, p. 17; Ref. 34, p.12; Ref. 69, p.35-36	
	GSWC – Florence /Graham: Converse Well 01	7,871.25	Ref. 33, p. 9; Ref. 34, p.6-7	
	GSWC – Florence /Graham: Goodyear Well 04	7,871.25	Ref. 33, p. 10; Ref. 34, p.6-7	
	GSWC – Florence /Graham: Nadeau Well 03	7,871.25	Ref. 33, p. 11; Ref. 34, p.6-7	
	South Gate CWD: Well 28	7,644.30	Ref. 33, p. 13; Ref. 34, p. 9-10	
Sum of Distance-Weighted Population Values:				**14,234.00**
Potential Contamination Factor Value (Sum /10):				**1,423.40**

Potential Contamination Factor Value: 1,423.40

3.3.3 RESOURCES

The Site is located within an industrial area. It is unknown whether wells located within the target distance limit are used for commercial food crop irrigation, commercial livestock watering, commercial food preparation, commercial aquaculture supply, or water recreation area supply. Therefore a Resources Factor Value of 0 is assigned in accordance with HRS Section 3.3.3.

Resources Factor Value: 0

3.3.4 WELLHEAD PROTECTION AREA

While much of the Los Angeles basin is potentially considered to be a wellhead protection area, the nearest confirmed groundwater protection area is located approximately 1.5 miles east of Source 1, and a total of 10 groundwater protection areas defined by Los Angeles County are found within the 4-mile TDL (Ref. 70, p.1). Therefore a wellhead protection area value of 5 has been assigned.

Wellhead Protection Area Factor Value: 5