Record of Decision
for
FOSET # 2 – Action Sites

Former McClellan Air Force Base, McClellan, California

U.S. Environmental Protection Agency
Region 9
San Francisco, California

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Final

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Acronyms and Abbreviations

AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center (also known as AFCEC/CIBW)
AFRPA	Air Force Real Property Agency
AoC	Administrative Order on Consent
AOC	area of concern
ARAR	applicable or relevant and appropriate requirement
AST	aboveground storage tank
bgs	below ground surface
BRAC	Base Realignment and Closure
CCR	California Code of Regulations
CDI	chronic daily intake
CDPH	California Department of Public Health
Central Valley Water Board	Central Valley Regional Water Quality Control Board
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CHHSLs	California Human Health Screening Levels
CIP	Community Involvement Plan
COC	contaminant of concern
CS	confirmed site
CSM	Conceptual Site Model
CTR	California Toxics Rule
CU	consolidation unit
DCA	dichloroethane
DCB	dichlorobenzene
DCE	dichloroethene
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DLM	Designated Level Methodology
DTSC	Department of Toxic Substances Control
EC	engineered controls
EPA	Environmental Protection Agency
EPC	exposure point concentration
ERA	ecological risk assessment
ESCA	Environmental Services Cooperative Agreement
(F2)	the portion of the site within FOSET # 2
FFA	Federal Facilities Agreement
FOSET	Finding of Suitability for Early Transfer
FOSS	Follow-on Strategic Sites
FS	feasibility study
FSS	Focused Strategic Sites
HHRA	human health risk assessment
HI	hazard index
HQ	hazard quotient
IC (#)	investigation cluster (used with a numeral to identify SVE investigation/cleanup areas)

IC	institutional control
ID	identification
IP	initial parcel
IRP	Installation Restoration Program
IWL	industrial waste line
IWTP	industrial wastewater treatment plant
lbs	pounds
MBP	McClellan Business Park, LLC
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
No.	number
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NTCRA	non-time critical removal action
OMB	Office of Management and Budget
OU	operable unit
OWS	oil and water separator
O&M	operation and maintenance
PAH	polycyclic aromatic hydrocarbon
PCA	tetrachloroethane
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PCG	preliminary cleanup goal
pCi/g	picocurie(s) per gram
ppbv	parts per billion by volume
PRL	potential release location
Ra-226	radium 226
RAB	Restoration Advisory Board
RAO	remedial action objective
RAR	removal action report
RAWP	remedial action work plan
RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action
RfD	reference dose
RI	remedial investigation
RICS	remedial investigation characterization summary
RI/FS	remedial investigation/feasibility study
ROD	record of decision
ROI	radius of influence
SA	study area
SARA	Superfund Amendment and Reauthorization Act
SF	slope factor
SLUC	State land use covenant
STLC	soluble threshold limit concentrations
SSG	shallow soil gas less than 15 feet below ground surface
SVE	soil vapor extraction
SVOC	semi-volatile organic compound
SVS	Small Volume Sites
TCDD	tetrachlorodibenzo-p-dioxin
TCE	trichloroethene

TEQ	toxicity equivalence
TMB	trimethylbenzene
TPH	total petroleum hydrocarbons
TPH-D	diesel-range total petroleum hydrocarbons
TPH-G	gasoline-range total petroleum hydrocarbons
TRV	toxicity reference value
TSCA	Toxic Substances Control Act
TTLC	total threshold limit concentrations
µg/dL	microgram per deciliter
UST	underground storage tank
UTL	upper tolerance level
VOC	volatile organic compound
WQL	Water Quality Limit

1.0 PART 1: THE DECLARATION

1.1 SITE NAME AND LOCATION

This Record of Decision (ROD) is for 43 Finding of Suitability for Early Transfer (FOSET) # 2 sites at the former McClellan Air Force Base (AFB) Superfund site in Sacramento, California. The 43 FOSET # 2 Action Sites consist of Installation Restoration Program (IRP) sites grouped geographically in the area to the east and south of the airfield (Figure 1-1). These sites are referred to as the Action Sites. The Action Sites come from larger site groupings known as the Follow-on Strategic Sites (FOSS), Small Volume Sites (SVS), and Building 252 Sites. The Remedial Investigation Characterization Summaries (RICS) Addenda and Feasibility Study (FS) were completed by the Air Force under these larger site groupings; however, most of the IRP sites from these groups that are located within FOSET # 2 are now being addressed through a private-sector cleanup by McClellan Business Park, LLC (MBP). The remainder of the IRP sites within these groups will continue to be addressed by the Air Force until they are transferred to MBP. This ROD selects remedies for both volatile organic compound (VOC) contaminants in shallow soil gas (depths less than 15 feet below ground surface [bgs]) and for non-VOC contaminants in soil within 15 feet bgs (with certain exceptions, specified in Section 2.2.4). The 43 sites included in this ROD are listed in Table 1-1.

Table 1-1 43 FOSET # 2 Action Sites

Follow-on Strategic Sites	Building 252 Sites	Small Volume Sites			
AOC G-3	CS T-030	CS 038	CS T-020	PRL S-019	SA 080
AOC G-4	PRL S-018	CS 040	CS T-021	PRL S-025	SA 096
AOC G-5		CS B-005	CS T-036	PRL S-036	SA 097
PRL S-043		CS S-007	CS T-047	SA 045	SA 100
PRL S-044		CS S-024	CS T-057	SA 049	SA 107
PRL S-045		CS S-026	PRL S-001	SA 055	SA 109 (F2)
PRL T-032		CS T-012	PRL S-002	SA 060	
SA 004		CS T-016	PRL S-006	SA 063	
		CS T-017	PRL S-017	SA 066	

Notes: AOC area of concern
CS confirmed site
F2 the portion of the site within FOSET # 2
PRL potential release location
SA study area

The former McClellan AFB is listed on the U.S. Environmental Protection Agency's (EPA) National Priorities List (NPL) and has a Federal Facilities Agreement (FFA) in place that governs investigation and cleanup at this former military facility. McClellan AFB was listed on July 22, 1987 (EPA, 2007), National Superfund database identification number CA4570024337. The primary regulatory agencies overseeing the former McClellan AFB cleanup are the EPA and the State of California Environmental Protection Agency, represented by the Department of Toxic Substances Control (DTSC) and the Central Valley Regional Water Quality Control Board (Central Valley Water Board). As described below, the Air Force has agreed in an amendment to the FFA (the FFA Amendment) that EPA, in consultation with DTSC and the Central Valley Water Board, will select response actions for the FOSET #2 Action Sites.

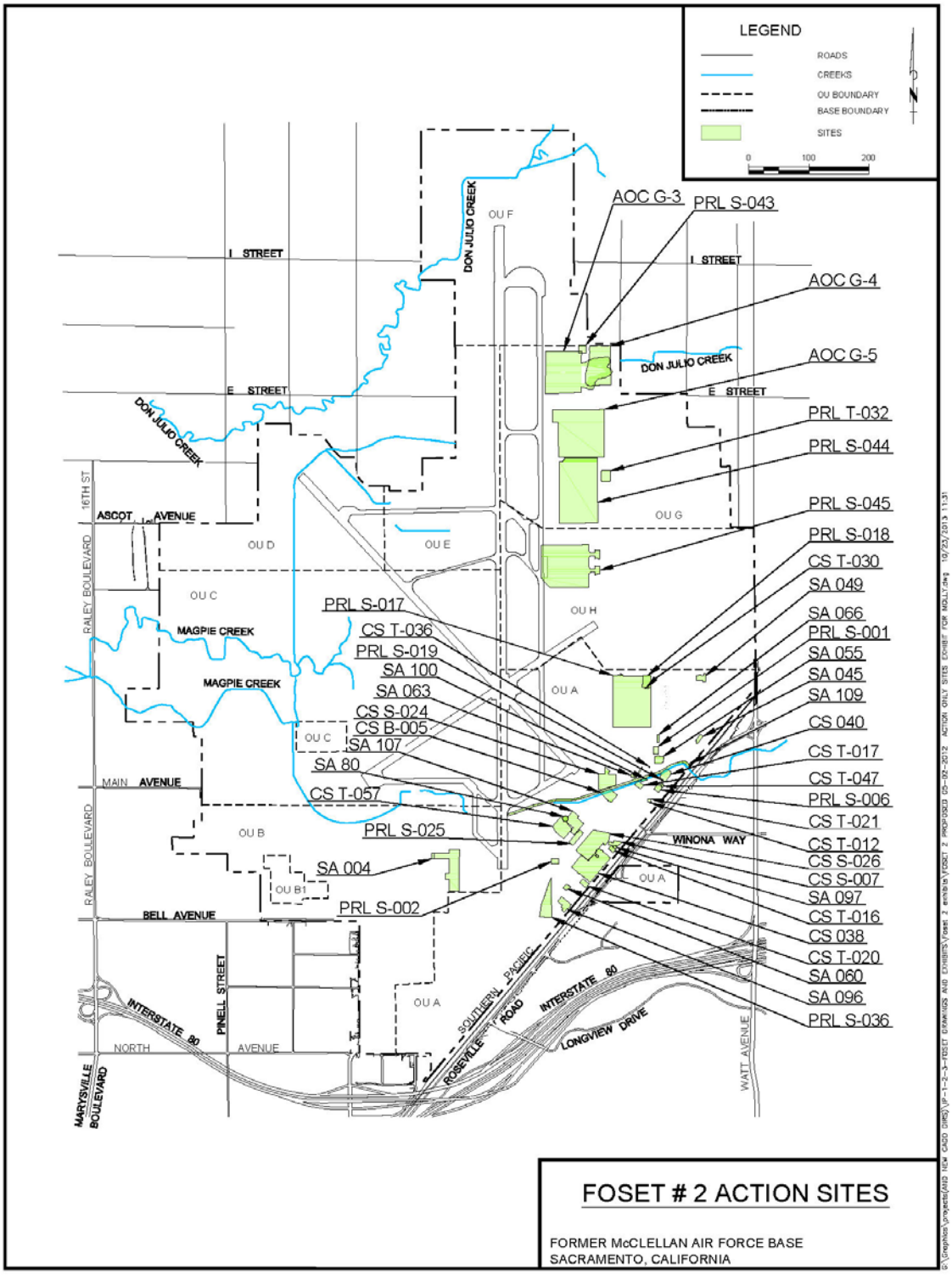

Figure 1-1 FOSET # 2 Action Sites Locations

1.2 STATEMENT OF BASIS AND PURPOSE

This ROD presents the selected remedies for soil and shallow soil gas at depths less than 15 feet bgs (with certain exceptions for soil, specified in Section 2.2.4) on the 43 Action Sites that were recommended for further action in the *FOSET # 2 Action Sites Proposed Plan* (Proposed Plan; EPA, 2014) within 528 acres of the former McClellan AFB Superfund Site, referred to as the "FOSET # 2 Property," and addresses public comments on the Proposed Plan. EPA issued the Proposed Plan as part of its public involvement responsibility under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 117 and Part 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Proposed Plan and this ROD address the community involvement requirements of CERCLA.

The FOSET # 2 Property was included in the third portion of the former McClellan AFB selected for early transfer with privatized cleanup ("privatization"). Pursuant to CERCLA and Executive Order 12580, the Air Force is responsible for environmental restoration at its facilities. At facilities which are listed on EPA's NPL, EPA and the Air Force jointly select the remedy with the concurrence of DTSC and the Central Valley Water Board under the terms of a FFA. Although CERCLA generally requires the Air Force to complete the cleanup of contamination prior to the transfer of property, it also allows the Air Force to transfer property before it has been cleaned up with the approval of EPA and the Governor of the State of California. This process, which is documented in a FOSET, requires the Air Force to provide assurances that the necessary remedial action will be completed. At former McClellan AFB, the Air Force entered into an agreement with the new owner of the property, MBP, to fund the cleanup. MBP will conduct the cleanup of contamination within the first 15 feet of soil (with certain exceptions, specified in Section 2.2.4) pursuant to the terms of an Administrative Order on Consent (AoC) with EPA, DTSC, and the Central Valley Water Board. The FFA was amended to suspend the obligation of the Air Force to conduct the cleanup of the FOSET #2 Action Sites and document the Air Force's agreement that EPA, in consultation with DTSC and the Central Valley Water Board, shall select remedies for the FOSET #2 Action Sites. Therefore EPA has selected the remedy for these 43 Action Sites within the property transferred under FOSET #2.

As described in the 2013 AoC and the FFA Amendment, the Air Force retains the responsibility for cleanup of groundwater and existing contamination, pollution, or other environmental conditions deeper than 15 feet bgs (excepting the four locations identified in Section 2.2.4). Groundwater contamination is present below the FOSET # 2 Property, and is being addressed under the 2007 *Final Basewide VOC (volatile organic compound) Groundwater Record of Decision* (VOC Groundwater ROD; Air Force Real Property Agency [AFRPA], 2007) and the *Non-VOC Amendment to the Basewide VOC Groundwater Record of Decision* (Non-VOC ROD Amendment; AFRPA, 2009) and is, therefore, not covered by this ROD. The threat to groundwater from VOCs at several of the sites in FOSET #2 is currently being addressed through soil vapor extraction (SVE) as selected in the VOC Groundwater ROD, and is therefore not addressed by this ROD (AFRPA, 2007). Potential VOC impacts to groundwater will continue to be addressed at these sites using SVE until an SVE termination and optimization process decision is made per the VOC Groundwater ROD (AFRPA, 2007).

If, during implementation of the FOSET # 2 remedial activities, MBP finds soil contamination exceeding cleanup levels deeper than 15 feet bgs (which is defined as a "Retained Condition" in the 2013 AoC excepting the four locations identified in Section 2.2.4), the AoC recognizes the Environmental Services Cooperative Agreement (ESCA) process, in which MBP (on behalf of the County of Sacramento) consults with the Air Force on how to address the Retained Condition (AFRPA, 2012b). Pursuant to the ESCA and as recognized in the AoC, the Air Force (with the approval of EPA, MBP and the County of Sacramento) may choose to treat the Retained Condition as an "Added Condition" under the AoC, in which case the AoC shall govern the response action to be implemented by MBP and the funding for such

action shall be paid by the Air Force though the ESCA. To the extent necessary due to the scope of the discovered Retained Condition, the Air Force retains the responsibility for addressing any remedial change in accordance with 40 CFR [Code of Federal Regulations] 300.435(c).

VOCs include many chlorinated solvents and petroleum-related compounds. Non-VOCs include semi-volatile organic compounds (SVOCs), metals, and petroleum hydrocarbons. SVOCs addressed in this ROD include polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), dioxins/furans, and pesticides. Petroleum hydrocarbons include two primary classes of compounds: total petroleum hydrocarbons (TPH) as diesel (TPH-D) and as gasoline (TPH-G). Petroleum product contamination is exempt from CERCLA; however, EPA guidance states that if petroleum product contamination is commingled with CERCLA-regulated contamination, the petroleum contamination is also addressable under CERCLA. Because the TPH contamination at the FOSET # 2 Property was assumed to be commingled with other CERCLA contaminants, the TPH contamination is addressed in this ROD. The Central Valley Water Board intends to administratively close underground storage tanks (USTs) and oil and water separators (OWSs) that have not previously been closed.

The remedies for the FOSET # 2 Property were selected in accordance with CERCLA, as amended by the Superfund Amendment and Reauthorization Act (SARA), and the NCP. The decision documented in this ROD is based on the Administrative Record for the former McClellan AFB, which has been developed in accordance with §113(k) of CERCLA, 42 U.S.C. §9613(k). The Administrative Record Index identifies all the items that support the remedy selection. The FOSET # 2 Action Sites ROD will become part of the Administrative Record for the former McClellan AFB.

1.3 ASSESSMENT OF THE SITES

The FOSET # 2 Action Sites include 43 IRP sites previously identified by the Air Force. As a result of past industrial activities at the FOSET #2 Property, hazardous substances and pollutants or contaminants have been or may have been released to the soil in this area. The response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. There are 80 additional IRP sites covered by FOSET #2 (Group 2 sites); remedies will be selected for those sites by EPA in a subsequent ROD.

1.4 DESCRIPTION OF SELECTED REMEDIES

EPA selected the remedies for the FOSET # 2 Action Sites based on the site-specific characterizations detailed in the Small Volume Sites RICS Addenda and FS (CH2MHill, 2011), the Follow-on Strategic Sites RICS and FS (CH2MHill, 2012), and the Building 252 RICS and FS (CH2MHill, 2010).

The selected remedies address:

- VOCs in shallow soil gas (SSG) that may present a threat to human health through the vapor inhalation pathway; and

- Non-VOCs in soil that may present a threat to human health through direct contact, inhalation, or ingestion, or that may present a threat to groundwater or surface water quality protection.

Individual site characteristics and risk summaries for each of the sites (found in Section 2.5) and the selected remedies for the FOSET # 2 Action Sites are presented in Tables 2-1 and 2-2. The tables highlight site contaminants of concern (COCs) exceeding cleanup levels. The final selected remedies for the FOSET # 2 Action Sites generally use cleanup levels for industrial or industrial/commercial land use, which is the current and reasonably anticipated future use of the FOSET # 2 Property. The FOSET # 2

Action Sites were selected based on the need to actively remediate non-VOC contamination. Many FOSET # 2 Action Sites have both VOC and non-VOC remedies.

The selected remedies will provide protection to human health and the environment by either removing contaminants from the site, thereby reducing residual risk, or by limiting exposure to human receptors by implementing engineered and institutional controls (ECs and ICs). Sites requiring ECs or ICs will be available for limited use. Action Sites with both VOC and non-VOC contamination have two selected remedies. Alternative 1, No Further Action, was evaluated for each Action Site in the FSs (CH2MHill, 2010, 2011, and 2012), which is required as a baseline for comparative analysis of the other remedy alternatives.

1.4.1 Alternative VOC2 – Institutional Controls (ICs) to Restrict Land Use

Alternative VOC2 has been selected for 16 of the FOSET # 2 Action Sites (Area of Concern [AOC] G-3, AOC G-5, Confirmed Site [CS] 040, CS B-005, CS S-024, CS T-016, CS T-047, [Potential Release Location] PRL S-001, PRL S-006, PRL S-017, PRL S-019, PRL S-043, PRL S-044, PRL S-045, Study Area [SA] 004, and SA 100); 13 of the sites chosen for Alternative VOC2 will be remedied in combination with Alternative Non-VOC4a (AOC G-3, AOC G-5, CS 040, CS B-005, CS S-024, CS T-016, CS T-047, PRL S-001, PRL S-006, PRL S-017, PRL S-019, PRL S-044, and SA 100); and three of the sites chosen for Alternative VOC2 will be remedied in combination with Alternative Non-VOC4b (PRL S-043, PRL S-045, and SA 004).

ICs are non-engineered instruments such as administrative and/or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use (such as permits, zoning, and/or deed restrictions). The ICs associated with Alternative VOC2 are intended to minimize the potential for human exposure to soil gas contamination at levels exceeding the EPA risk management range within the upper 15 feet bgs by prohibiting residential and sensitive receptor (e.g., daycares, public or private schools for persons under 18 years of age, hospitals, etc.) uses.

The future land use is expected to be industrial or commercial; the maintenance, monitoring, enforcement, and reporting of the selected ICs will be protective of human health and the environment and comply with applicable or relevant and appropriate requirements (ARARs). The ICs selected under Alternative VOC2 will restrict land use such that the contaminated portion of the property may not be used for sensitive uses such as homes, day care centers, health care centers, or public or private schools for persons under 18 years of age. The use restrictions will be implemented through inclusion in the property deeds and state land use covenant (SLUC) recorded on the property, which will be enforced by DTSC and the Central Valley Water Board. Alternative VOC2 includes monitoring and enforcement of the ICs. The site features maps for each site (see figures in Attachment D) show the associated IC compliance boundaries, which apply to the legal lot(s) in which each applicable Action Site is located. The IC compliance boundaries define the extent of the area to which ICs are applicable. Some sites also include a 100-foot buffer zone (see Section 1.4.2, which applies only to sites where VOC3 was selected).

1.4.2 Alternative VOC3 – Institutional Controls to Restrict Land Use and Engineered Controls to Mitigate Shallow Soil Gas Contamination

Alternative VOC3 has been selected for 11 of the FOSET # 2 Action Sites (AOC G-4, CS 038, CS S-007, CS S-026, CS T-020, CS T-057, PRL T-032, SA 066, SA 080, SA 097, and SA 107); all 11 of the sites chosen for Alternative VOC3 will be remedied in combination with Alternative Non-VOC4a.

Land use activity restrictions would be used to mitigate the potential for VOCs in SSG to migrate into buildings and impact occupants via the vapor inhalation pathway. This remedy would restrict residential

or sensitive land use as described for Alternative VOC2 through the use of the same types of IC mechanisms (i.e., deeds and SLUCs). In addition to the ICs, Alternative VOC3 would require the installation of approved ECs (such as vapor barriers, gas collection systems, and/or ventilation systems) in any future buildings or during significant remodeling of existing buildings (e.g., remodeling that requires replacing major portions of the foundation or floor) at these sites. Vapor controls are required unless new sampling indicates that SSG IC compliance levels in Table 2-5 are not exceeded, or a risk assessment based on new sampling is performed to evaluate the risk posed under CERCLA and the NCP, as determined by EPA, in consultation with DTSC and the Central Valley Water Board. The selection of the controls to be implemented will be based on whether the controls are to be implemented on an existing building or future construction. For existing buildings, the building design, foundation type (e.g., slab, raised, etc.), and function of the building (e.g., warehouse, office building, etc.) will be used to determine the most appropriate type of EC in the approved work plan). For new buildings, a vapor barrier is assumed to be the most appropriate type of EC; however, this will ultimately be determined during the building design phase and approved by EPA, in consultation with DTSC and the Central Valley Water Board. The specific IC compliance boundaries and the restrictions to be incorporated into the ICs are identified in the site-specific figures in Attachment D and Table 2-7, respectively. The IC compliance boundaries define the extent of the area to which ICs are applicable. Because of the potential for migration of shallow soil gas, sites where VOC3 is selected also include a 100 foot buffer zone, such that ICs for VOC3 will extend to the lot boundaries for lots that include a portion of the 100 foot buffer zone.

1.4.3 Alternative Non-VOC4a – Excavation and Disposal and Institutional Controls to Restrict Land Use

Alternative Non-VOC4a has been selected for 37 of the FOSET # 2 Action Sites (AOC G-3, AOC G-4, AOC G-5, CS 038, CS 040, CS B-005, CS S-007, CS S-024, CS S-026, CS T-012, CS T-016, CS T-017, CS T-020, CS T-021, CS T-030, CS T-036, CS T-047, CS T-057, PRL S-001, PRL S-002, PRL S-006, PRL S-017, PRL S-018, PRL S-019, PRL S-025, PRL S-044, PRL T-032, SA 045, SA 049, SA 060, SA 063, SA 066, SA 080, SA 096, SA 097, SA 100, and SA 107); 13 of the sites chosen for Alternative Non-VOC4a will be remedied in combination with Alternative VOC2 (AOC G-3, AOC G-5, CS 040, CS B-005, CS S-024, CS T-016, CS T-047, PRL S-001, PRL S-006, PRL S-017, PRL S-019, PRL S-044, and SA 100); and 11 of the sites chosen for Alternative Non-VOC4a will be remedied in combination with Alternative VOC3 (AOC G-4, CS 038, CS S-007, CS S-026, CS T-020, CS T-057, PRL T-032, SA 066, SA 080, SA 097, and SA 107).

Under Alternative Non-VOC4a, the FOSET # 2 Action Sites with contaminated soil and/or sediment within the upper 15 feet bgs (with certain exceptions, specified in Section 2.2.4) above industrial use cleanup levels and/or water quality protective cleanup levels will be excavated, and the excavated soil will be transported to an appropriate facility for disposal. Water quality protective cleanup levels are soil cleanup levels that were established by the Central Valley Water Board to protect surface water or groundwater quality. For example, surface soil with concentrations above the water quality protective levels could impact ecological receptors if contaminated soil erodes and is transported to a surface water body. Alternative Non-VOC4a also may include treatment, if required to meet landfill disposal requirements, of some of the excavated soil prior to disposal. All soil containing concentrations of contaminants above restricted use levels will be removed and the resulting land use is restricted to prohibit residential or sensitive land use as described above for Alternative VOC2.

Alternative Non-VOC4a also includes ECs (such as maintaining the existing surface cover or sediment collection) as necessary, ICs, and monitoring as described in detail in Section 2.9. The ICs are the same as those in Alternative VOC2 and will also be implemented through the deed and SLUC. In addition, the deed and SLUC will include digging restrictions for sites where surface cover must be maintained, as indicated in Table 2-7. The site features maps for each site (see figures in Attachment D) show the

associated IC compliance boundaries, which apply to the legal lot(s) in which each applicable IRP site is located. The IC compliance boundaries define the extent of the area to which ICs are applicable.

1.4.4 Alternative Non-VOC4b – Excavation/Disposal (Unrestricted Land Use)

Alternative Non-VOC4b has been selected for six of the FOSET # 2 Action Sites (PRL S-036, PRL S-043, PRL S-045, SA 004, SA 055, and SA 109 [F2]); three of the sites chosen for Alternative Non-VOC4b will be remedied in combination with Alternative VOC2 (PRL S-043, PRL S-045, and SA 004).

Under Alternative Non-VOC4b, the contaminated soil and/or sediment within the upper 15 feet bgs (with certain exceptions, specified in Section 2.2.4) above unrestricted use cleanup levels and/or water quality protective cleanup levels will be excavated, and the excavated soil will be transported to an appropriate facility for disposal. Alternative Non-VOC4b also may include treatment, if required to meet landfill disposal requirements, of some of the excavated soil prior to disposal. All soil containing concentrations of contaminants above residential cleanup levels and water quality protective cleanup levels will be removed. Under Alternative Non-VOC4b, because all contamination above unrestricted use cleanup levels would physically be removed from the site, no ICs or long-term monitoring would be required; however, the Non-VOC4b sites at which VOC2 or VOC3 is also selected would require ICs and monitoring. Alternative Non-VOC4b would facilitate unrestricted use of the site, including residential use, public or private schools for persons under 18 years of age, and/or day care centers at sites where VOC2 or VOC3 is not also selected.

1.4.5 Summary of the Selected Remedies

The selected remedies for the FOSET # 2 Action Sites are summarized in Table 1-2 and are described further in Section 2.12.

Table 1-2 Selected Remedies for FOSET # 2 Action Sites

Site Name	Selected Remedy	Remedy Description	Contaminants Addressed	
			VOCs in SSG	Soil
AOC G-3	VOC2 and Non-VOC4a	ICs; Excavation and Disposal– Restricted Land Use	Benzene Methylene Chloride Naphthalene PCE	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Indeno(1,2,3-c,d)pyrene
AOC G-4	VOC3 and Non-VOC4a	ICs/ECs; Excavation and Disposal– Restricted Land Use	1,4-DCB Benzene Chloroform Methylene Chloride Naphthalene PCE	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Indeno(1,2,3-c,d)pyrene Naphthalene

Site Name	Selected Remedy	Remedy Description	Contaminants Addressed	
			VOCs in SSG	Soil
AOC G-5	VOC2 and Non-VOC4a	ICs; Excavation and Disposal– Restricted Land Use	Benzene Chloroform Naphthalene PCE TCE	PCBs (Aroclor-1260) Lead Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Indeno(1,2,3-c,d)pyrene
CS 038	VOC3 and Non-VOC4a	ICs/ECs; Excavation and Disposal– Restricted Land Use	Benzene Carbon Tetrachloride Chloroform 1,4-DCB Ethylbenzene Hexane Naphthalene PCE TCE 1,3,5-TMB 1,2,4-TMB Vinyl Chloride	TPH-G
CS 040	VOC2 and Non-VOC4a	ICs; Excavation and Disposal– Restricted Land Use	1,1-DCA Benzene Chloroform cis-1,2-DCE Naphthalene PCE TCE Vinyl Chloride	PCBs (Aroclor-1260) Dieldrin Lead Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Indeno(1,2,3-c,d)pyrene
CS B-005	VOC2 and Non-VOC4a	ICs; Excavation and Disposal– Restricted Land Use	Benzene	Antimony Arsenic Benzo(a)pyrene Cadmium Cobalt Copper Lead Manganese Zinc Dioxins/Furans
CS S-007	VOC3 and Non-VOC4a	ICs/ECs; Excavation and Disposal– Restricted Land Use	Benzene Ethylbenzene Naphthalene PCE TCE	Benzo(a)pyrene Benzo(a)anthracene Dibenzo(a,h)anthracene Indeno(1,2,3-c,d)pyrene Naphthalene 1,2-DCB 1,3-DCB 1,4-DCB TPH-D Lead

Site Name	Selected Remedy	Remedy Description	Contaminants Addressed	
			VOCs in SSG	Soil
CS S-024	VOC2 and Non-VOC4a	ICs; Excavation and Disposal– Restricted Land Use	TCE Ethylbenzene PCE Benzene	PCBs (Aroclor-1260) TPH-G
CS S-026	VOC3 and Non-VOC4a	ICs/ECs; Excavation and Disposal– Restricted Land Use; Monitoring	Hexachlorobutadiene 1,2,4-TMB 1,3,5-TMB Carbon Tetrachloride PCE	TPH-D TPH-G
CS T-012	Non-VOC4a	Excavation and Disposal– Restricted Land Use	None	Benzo(a)pyrene Benzo(a)anthracene Benzo(b)fluoranthene TPH-D TPH-G
CS T-016	VOC2 and Non-VOC4a	ICs; Monitoring; Excavation and Disposal– Restricted Land Use	Chloroform Naphthalene Ethylbenzene Benzene	TPH-D TPH-G
CS T-017	Non-VOC4a	Excavation and Disposal– Restricted Land Use	None	TPH-G Benzo(a)pyrene Benzo(a)anthracene Benzo(b)fluoranthene Chrysene
CS T-020	VOC3 and Non-VOC4a	ICs/ECs; Excavation and Disposal	Benzene	TPH-D TPH-G
CS T-021	Non-VOC4a	Excavation and Disposal– Restricted Land Use	None	Benzo(a)pyrene Benzo(a)anthracene Benzo(b)fluoranthene TPH-D TPH-G
CS T-030	Non-VOC4a	Excavation and Disposal	None	Mercury PAHs*
CS T-036	Non-VOC4a	Excavation and Disposal– Restricted Land Use	None	Dieldrin
CS T-047	VOC2 and Non-VOC4a	ICs; Excavation and Disposal– Restricted Land Use	Benzene 1,1-DCA Chloroform cis-1,2-DCE Vinyl Chloride TCE PCE	Naphthalene 2-Methylnaphthalene TPH-D TPH-G

Site Name	Selected Remedy	Remedy Description	Contaminants Addressed	
			VOCs in SSG	Soil
CS T-057	VOC3 and Non-VOC4a	ICs/ECs; Excavation and Disposal– Restricted Land Use; Monitoring	1,2,4-TMB 1,3,5-TMB 1,2-DCA Benzene Chloroform cis-1,2-DCE Ethylbenzene Naphthalene PCE TCE Vinyl Chloride	Dioxins/Furans Lead
PRL S-001	VOC2 and Non-VOC4a	ICs; Excavation and Disposal– Restricted Land Use	Benzene Carbon Tetrachloride Chloroform Ethylbenzene Naphthalene PCE TCE	Cadmium Lead
PRL S-002	Non-VOC4a	Excavation and Disposal– Restricted Land Use	None	PCBs (Aroclor-1260) Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene
PRL S-006	VOC2 and Non-VOC4a	ICs; Excavation and Disposal– Restricted Land Use	1,1- DCA Benzene Chloroform cis-1,2-DCE Naphthalene PCE TCE Vinyl Chloride	PCBs (Aroclor-1260) Dieldrin Lead Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Indeno(1,2,3-c,d)pyrene
PRL S-017	VOC2 and Non-VOC4a	ICs; Excavation and Disposal– Restricted Land Use	Benzene Carbon Tetrachloride Chloroform Naphthalene TCE	TPH-D TPH-G
PRL S-018	Non-VOC4a	Excavation and Disposal	None	Mercury
PRL S-019	VOC2 and Non-VOC4a	ICs; Excavation and Disposal– Restricted Land Use	1,1-DCA Benzene Chloroform cis-1,2-DCE Naphthalene PCE TCE Vinyl Chloride	PCBs (Aroclor-1260) Dieldrin Lead Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Indeno(1,2,3-c,d)pyrene

Site Name	Selected Remedy	Remedy Description	Contaminants Addressed	
			VOCs in SSG	Soil
PRL S-025	Non-VOC4a	Excavation and Disposal– Restricted Land Use	None	PCBs (Aroclors-1254 and 1260) TPH-D TPH-G
PRL S-036	Non-VOC4b	Excavation and Disposal	None	PCBs (Aroclor-1260)
PRL S-043	VOC2 and Non-VOC4b	ICs; Monitoring; Excavation and Disposal	PCE	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Indeno(1,2,3-c,d)pyrene Chrysene TPH-G
PRL S-044	VOC2 and Non-VOC4a	ICs; Excavation and Disposal– Restricted Land Use	Benzene Naphthalene TCE	PCBs (Aroclor-1260) Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Indeno(1,2,3-c,d)pyrene Lead
PRL S-045	VOC2 and Non-VOC4b	ICs; Excavation and Disposal	Benzene 1,2-DCA Chloroform Naphthalene	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene PCBs (Aroclors-1254 and 1260)
PRL T-032	VOC3 and Non-VOC4a	ICs/ECs; Excavation and Disposal– Restricted Land Use; Monitoring	1,2,4-TMB 1,3,5-TMB Benzene Ethylbenzene m,p-Xylene Methylene Chloride Naphthalene	1-Methylnaphthalene Benzo(a)pyrene Naphthalene TPH-D TPH-G
SA 004	VOC2 and Non-VOC4b	ICs; Excavation and Disposal	Naphthalene 2-Methylnaphthalene PCE	PCBs (Aroclor-1260)
SA 045	Non-VOC4a	Excavation and Disposal– Restricted Land Use	None	Naphthalene 1-Methylnaphthalene 2-Methylnaphthalene TPH-D TPH-G
SA 049	Non-VOC4a	Excavation and Disposal– Restricted Land Use	None	PCBs (Aroclor-1260) Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene
SA 055	Non-VOC4b	Excavation and Disposal	None	Lead PCBs (Aroclor-1260)
SA 060	Non-VOC4a	Excavation and Disposal– Restricted Land Use	None	TPH-D

Site Name	Selected Remedy	Remedy Description	Contaminants Addressed	
			VOCs in SSG	Soil
SA 063	Non-VOC4a	Excavation and Disposal– Restricted Land Use	None	PCBs (Aroclor-1260)
SA 066	VOC3 and Non-VOC4a	ICs/ECs; Monitoring; Excavation and Disposal– Restricted Land Use	Benzene Carbon Tetrachloride Chloroform 1,4-DCB Ethylbenzene Naphthalene PCE TCE 1,2,4-TMB 1,3,5-TMB	TPH-D
SA 080	VOC3 and Non-VOC4a	ICs/ECs; Excavation and Disposal– Restricted Land Use; Monitoring	1,2,4-TMB 1,3,5-TMB 1,2-DCA Benzene Chloroform cis-1,2-DCE Ethylbenzene Naphthalene PCE TCE Vinyl Chloride	Dioxins/Furans Lead
SA 096	Non-VOC4a	Excavation and Disposal– Restricted Land Use	None	TPH-D TPH-G
SA 097	VOC3 and Non-VOC4a	ICs/ECs; Excavation and Disposal– Restricted Land Use; Monitoring	cis-1,2-DCE PCE TCE	Cadmium Lead PCBs (Aroclors-1254 and 1260) TPH-D 4-Chloroaniline
SA 100	VOC2 and Non-VOC4a	ICs; Excavation and Disposal– Restricted Land Use	Benzene Chloroform Carbon Tetrachloride	Dioxins/Furans Lead
SA 107	VOC3 and Non-VOC4a	ICs/ECs; Excavation and Disposal– Restricted Land Use; Monitoring	1,2,4-TMB 1,3,5-TMB 1,2-DCA Benzene Chloroform cis-1,2-DCE Ethylbenzene Naphthalene PCE TCE Vinyl Chloride	Dioxins/Furans Lead

Site Name	Selected Remedy	Remedy Description	Contaminants Addressed	
			VOCs in SSG	Soil
SA 109 (F2)	Non-VOC4b	Excavation and Disposal	None	Cadmium Chlordane (alpha, gamma) DDD DDE DDT Dieldrin Lead PCBs (Aroclors-1254 and 1260)

Notes: Cleanup Levels and IC Compliance Levels are presented in Table 2-3 and Table 2-5, respectively. Levels for the protection of surface water and groundwater for evaluation of ICs/ECs are presented in Table 2-4.
* PAHs were added for CS T-030 based on the SVS and Building 252 Radiological Non-Time Critical Removal Action (NTCRA). During the SVS and Building 252 Radiological NTCRA, the tanks were found to contain product and when the tanks were removed, one sample location had PAHs. The extent of PAHs has not been delineated and PAHs have been added as a COC.

AOC	area of concern
CS	confirmed site
COC	contaminant of concern
DCA	dichloroethane
DCB	dichlorobenzene
DCE	dichloroethene
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
EC	engineered control
F2	the portion of the site within FOSET # 2
IC	institutional control
PAH	polycyclic aromatic hydrocarbon
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
PRL	potential release location
SA	study area
SSG	shallow soil gas
TCE	trichloroethene
TMB	trimethylbenzene
TPH-D	total petroleum hydrocarbons in the diesel range
TPH-G	total petroleum hydrocarbons in the gasoline range
VOC	volatile organic compound

1.5 STATUTORY DETERMINATIONS

EPA has selected the remedies for the FOSET # 2 Action Sites specified in Table 1-2. The response actions selected in this ROD are necessary to protect public health or the environment from actual or threatened releases of hazardous substances into the environment and from actual or threatened releases of pollutants. The selected remedies are protective of human health and the environment, comply with federal and state ARARs for the remedial actions, and are cost effective. The selected site remedies do not satisfy the statutory preference for treatment as a principal element of the remedies because costs to achieve the same risk reduction using treatment are significantly higher, treatment is not fiscally practical due to extraordinarily high costs to address relatively low VOC concentrations in soil vapor, and because contaminant concentrations in soil indicate that treatment would not be required to dispose of soil in a permitted landfill (treatment is not expected to be necessary; however, need for treatment cannot be determined until excavation occurs and the removed soil is characterized for disposal).

The selected remedies for many of the sites will result in hazardous substances, pollutants, or contaminants remaining onsite above levels that would allow for unlimited use and unrestricted exposure.

Therefore, a statutory review (i.e., a CERCLA five-year review) will be conducted within five years after initiation of remedial action, and every five years thereafter, to ensure that the remedy is, or will be, protective of human health and the environment. CERCLA five-year reviews will be required for sites with VOC2, VOC3, and/or Non-VOC4a as the selected remedy. Other remedies implemented at the former McClellan AFB under other RODs also require five-year reviews. All of the five-year reviews at the former McClellan AFB are performed on the same schedule and documented in a single basewide report. The FOSET # 2 Action Sites will be included in the basewide five-year review. The next review will occur in 2019, prior to the implementation of the selected remedies. The first five-year review to address these remedies will be in 2019 and every five years thereafter to ensure that the remedies are, or will be, protective of human health and the environment.

1.6 DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary in Section 2.0 of this ROD. Additional information can be found in the Administrative Record file for the FOSET # 2 Property.

- Site descriptions and histories (Section 2.5, Table 2-1, and Attachment D);
- A summary of the risk represented by the COCs (Section 2.7, Table 2-2, and Attachment C);
- A list of the COCs and cleanup levels (Section 2.8.3, Table 2-3);
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of land and groundwater used in the baseline risk assessment and ROD (Section 2.6);
- Potential land and groundwater use that will be available following implementation of the remedial action (Section 2.6);
- Estimated cost of the remedies (Section 2.12.6 and Table 2-9);
- The Principal Threat Wastes (Section 2.11); and
- The key factor(s) that led to selecting the remedies (Section 2.13).

This ROD was prepared in compliance with the guidance published by EPA for preparation of RODs (EPA, 1999).

1.7 AUTHORIZING SIGNATURES

The ROD documents the selected remedies for soil contamination at the FOSET # 2 Action Sites. Pursuant to Section III of the 2010 Federal Facilities Agreement Amendment, EPA is selecting response actions for the FOSET # 2 Action Sites, in consultation with DTSC and the Central Valley Water Board. The Assistant Director of Federal Facilities and Site Cleanup Branch (EPA, Region 9) has been delegated the authority to approve and sign this ROD.

3/2/2015

ANGELES HERRERA
Assistant Director of Federal Facilities and Site Cleanup Branch
Region 9, U.S. Environmental Protection Agency

Date

State Acceptance

The DTSC and the Central Valley Water Board had an opportunity to review and comment on the FOSET # 2 Action Sites ROD, and their concerns have been addressed.

3/11/15

CHARLES RIDENOUR
Branch Chief, Sacramento Office Cleanup Program
Brownfields and Environmental Restoration Program
Department of Toxic Substances Control
California Environmental Protection Agency

Date

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2.0 PART 2: THE DECISION SUMMARY

This Decision Summary provides a description of the site-specific factors and analyses that led to the selection of the remedies for the FOSET # 2 Action Sites. It includes background information about the nature and extent of contamination and the rationale for the selection of the remedies.

2.1 SITE NAME, LOCATION, AND DESCRIPTION

The former McClellan AFB, which encompasses 3,452 acres, is located 7 miles northeast of downtown Sacramento, California (Comprehensive Environmental Response, Compensation, and Liability Information System [CERCLIS] Identification [ID] Number CA 4570024337 and Superfund Site ID Number 0902759). Following the listing of the former McClellan AFB on the NPL, EPA, the California Department of Health Services (now the Department of Toxic Substances Control), and the Air Force entered into a FFA on May 2, 1990 (Department of the Air Force, 1990). The FFA identified the Air Force as the lead agency and required the Air Force to identify, perform, and complete all necessary environmental cleanup and response actions, including operation and maintenance (O&M) at the site under CERCLA. Funds to complete the response actions for the FOSET # 2 Action Sites are being provided to MBP by the Air Force through agreements with Sacramento County (AFRPA, 2012b).

The former McClellan AFB is surrounded by the City of Sacramento to the west and southwest, unincorporated areas of Antelope on the north, Rio Linda on the northwest, and North Highlands on the east.

From 1936 until 2001, McClellan AFB was an aircraft repair depot and supply base. On July 22, 1987, all of McClellan AFB, including the FOSET # 2 Property, was added to the NPL as a site with known releases or threatened releases of hazardous substances, pollutants, or contaminants that warranted further investigation and cleanup under CERCLA.

The predominant current land uses at the former McClellan AFB are industrial, aviation, commercial, and residential. There are also open areas, some of which are relatively large. Land parcels designated for commercial, office, and industrial uses are interspersed around the Property and are used for shopping centers, office complexes, military operations (U.S. Coast Guard), rescue training, schools, and warehouses.

The FOSET # 2 Action Sites are located on the eastern and southern portions of the former McClellan AFB (Figure 1-1). The FOSET # 2 Action Sites do not currently have any residential areas and only minimal ecological habitat.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.2.1 Site History

McClellan AFB was an active industrial facility since its dedication in 1936, when it was called the Sacramento Air Depot. Operations changed from the maintenance of bombers during World War II and the Korean War to the maintenance, repair, modification, and disassembly of jet aircraft in the 1960s. More recently, operations were expanded to include the maintenance and repair of communications equipment and electronics. Hazardous substances were utilized at a number of facilities on-base, including disposal pits, washracks, fuel and oil storage, electronics repair and testing facilities, aircraft painting facilities, wastewater treatment plants, machine shops, and open storage areas. In 1995, the Congressional Base Realignment and Closure (BRAC) Commission recommended closure of McClellan AFB; and on July 13, 2001, McClellan AFB was closed as an active military facility.

The FOSET # 2 Action Sites include former aircraft repair, testing, and support facilities; fuel storage and distribution facilities; storage areas; and waste handling and treatment areas. A summary of the history for each site can be found in Table 2-1 and Attachment D.

2.2.2 Previous Investigations

In response to detections of contaminants in soil and groundwater, the Air Force initiated the first phase of the IRP in 1981. Under the IRP, the investigation and remediation of contamination at the Property has been conducted in accordance with CERCLA as amended by SARA and the NCP. The principal data collection and analysis components of the restoration program are the remedial investigations (RIs) at the IRP sites. The RIs are the primary source of site characterization data for the FOSET # 2 Action Sites.

Several phases of investigation have been conducted at each Action Site. Generally, the media collected during the sampling events included soil, soil gas, and groundwater. Information on site history, investigations performed, COCs, and resulting risk is discussed by site in Table 2-1 and Table 2-2. The results of all RIs were summarized and potential remedies evaluated in the Small Volume Sites RICS Addenda and FS (CH2MHill, 2011), the Follow-on Strategic Sites RICS and FS (CH2MHill, 2012), and the Building 252 RICS and FS (CH2MHill, 2010).

Removal actions have occurred at some of the FOSET # 2 Action Sites, including a radiological non-time critical removal action (NTCRA) associated with the SVS and Building 252 (CH2MHill, 2013), removal of USTs, and operation of SVE systems to address soil vapor contamination that could impact groundwater. Information regarding past removal actions is summarized in Section 2.4.1 and additional information can also be found in Attachment B.

2.2.3 Enforcement Activities

Following the listing of the former McClellan AFB on the NPL, EPA, the State California Department of Health Services (now the Department of Toxic Substances Control), and the Air Force entered into a FFA on May 2, 1990 (Department of the Air Force, 1990). The FFA identified the Air Force as the lead agency and required the Air Force to identify, perform, and complete all necessary environmental cleanup and response actions, including O&M at the site under CERCLA.

2.2.4 Base Closure and Privatization

Cleanup under the FOSET # 2 Action Sites ROD is being addressed through the process of privatization. In conjunction with the Early Transfer of the property and the execution of an AoC with the transferee, the FFA was amended on August 23, 2011, to suspend the obligation of the Air Force to conduct the response actions associated with the FOSET # 2 Property (AFRPA, 2011a). MBP is the current owner of the property and is responsible under the terms of the 2013 AoC for the implementation of remedial activities associated with SSG, soil, and subsurface soils to a depth of 15 feet bgs (with certain exceptions, as discussed in the next paragraph) at the FOSET #2 property.

Funds to complete the response actions for the FOSET # 2 Action Sites are being provided to MBP by the Air Force through agreements with Sacramento County (AFRPA, 2012b). The Air Force retains responsibility for the groundwater and soil contamination below a depth of 15 feet bgs (with the exception of four deeper areas which are included in this ROD and where MBP will address deeper soil contamination under the ESCA: up to 30 feet bgs at CS T-012 and CS T-021, up to 20 feet bgs at SA 045, and up to 25 feet bgs at CS T-020) and, if the selected remedy is not completed by MBP under the AoC, the obligation of the Air Force under the FFA is restored.

2.3 COMMUNITY PARTICIPATION

The former McClellan AFB has had an active community relations/public participation program since the beginning of restoration activities in the early 1980s. The purpose of the program is to help community members understand the former McClellan AFB's cleanup program and to learn how to become involved in the cleanup decision-making process.

From the initial FOSET # 2 planning stages prior to the transfer of the property and cleanup obligations, EPA, DTSC, and the Central Valley Water Board have invited the community to participate in the cleanup decision-making process and have kept the community informed through oral and published communications. In an effort to keep residents and tenants informed of plans, activities, and findings, the following procedures have been or will be implemented to facilitate an ongoing dialogue with the community.

2.3.1 Community Interviews and Fact Sheet

In March 2011, interviews were conducted with individuals representing MBP tenants, residents, the chief of staff for Supervisor Phil Serna, the chief of staff for former U.S. Rep. Dan Lungren and environmental advocates. The information gathered from these interviews formed the basis for how the community and businesses are informed about privatized cleanup activities. The interviews also helped to identify how to best address the public's concerns regarding the cleanup. A Fact Sheet was developed and distributed in April 2011.

2.3.2 Community Involvement Plan

The *Supplemental Community Involvement Plan* (CIP) *for Privatized Parcels* updates the McClellan Community Relations Plan and was developed to keep the communities and other stakeholders informed of plans, activities, and findings related to the former McClellan AFB privatized cleanup, including the cleanup of the FOSET # 2 Action Sites. The update was also aimed at ensuring the public has opportunities to express preferences and concerns. The updated CIP was finalized in October 2013; it identifies numerous opportunities for community dialogue and describes methods to provide the public with consistent, timely, and accurate information.

2.3.3 Public Notifications

On January 2, 2014, EPA ran a print ad in *The Sacramento Bee* announcing the release of the Proposed Plan (EPA, 2014). The notice invited the surrounding communities to attend an availability session and a public meeting on January 21, 2014, and it announced that comments on the Proposed Plan would be collected during a 30-day comment period. The print ad also identified where copies of the Proposed Plan and the site documents, including the RICS and FS, could be obtained for further information and review.

2.3.4 FOSET # 2 Action Sites Proposed Plan

The Proposed Plan had a two-fold purpose: 1) to present alternatives to the public that were being considered for cleanup of the FOSET # 2 Action Sites and 2) to request public input on those alternatives. The preferred cleanup alternatives were specifically identified and the public was requested to submit comments and concerns during the comment period, which opened on January 6, 2014, and closed on February 7, 2014.

2.3.5 FOSET # 2 Action Sites Proposed Plan Outreach

A Fact Sheet summarizing the FOSET # 2 Action Sites Proposed Plan was distributed by mail to residents and businesses within a quarter-mile radius surrounding the FOSET # 2 Action Sites and to persons on the EPA's former McClellan AFB mailing list. Also contained within the Proposed Plan was an invitation to learn more about the FOSET # 2 Action Sites cleanup at the availability session and public meeting held on January 21, 2014, at the North Highlands Community Center.

The Fact Sheet was mailed to approximately 1,000 on- or near-base recipients and also served to notify the public about the Proposed Plan and the opportunity for public comment.

2.3.6 FOSET # 2 Action Sites Proposed Plan Public Meeting

Representatives from county, state, and federal agencies were available to discuss the Proposed Plan during an Availability Session held on January 21, 2014, at the North Highlands Community Center. EPA formally presented the Proposed Plan and written and oral comments were formally documented during the Public Meeting Session. Comments were collected through February 7, 2014, and considered during development of the ROD. Responses to public comments are found in Section 3.0 – Responsiveness Summary.

2.3.7 EPA Participation in Outreach Events

The EPA attends community events to distribute information about projects and answer questions at an information booth or table. In addition, EPA coordinates with local municipal, environmental, or civic groups to provide information at special events.

The EPA also periodically participates in local and municipalities group meetings to provide the public with updates on the privatized cleanup of McClellan Park.

2.3.8 Restoration Advisory Board

Quarterly Restoration Advisory Board (RAB) meetings offer opportunities for the public to learn about environmental restoration and to become involved in the redevelopment process. These meetings are specifically designed for the public to voice concerns, ask questions, and raise issues about the cleanup process. The public is encouraged to serve on the RAB, representing the interests of various parts of the community, such as local residents, students, or environmental groups. Representatives from county, state, and federal agencies, MBP, and other community members also participate in the meetings.

2.3.9 Information Repositories

Information is available to facilitate discussion on environmental cleanup at the following websites.

- EPA: www.epa.gov/region09/McClellanAFB
- Air Force: http://afcec.publicadmin-record.us.af.mil/
- DTSC: www.envirostor.dtsc.ca.gov
- Central Valley Water Board: geotracker.waterboards.ca.gov

2.3.10 Administrative Record

Copies of documentation pertaining to the FOSET # 2 Property cleanup are available at the following locations:

EPA Region 9 Superfund Records Center
95 Hawthorne Street, Suite 403 S
San Francisco, California 94105
Telephone: 415-536-2000
Hours: Monday - Friday 8 a.m. to 5 p.m.

Air Force Repository
AFCEC/CIBW
3411 Olson Street
McClellan, California 95652-1071
Telephone: 916-643-1250 x239

2.4 SCOPE AND ROLE OF FOSET # 2 ACTION SITES RESPONSE ACTIONS

For environmental management purposes, the Air Force has subdivided the former McClellan AFB into the following 11 operable units (OUs): A, B, B1, C, C1, D, E, F, G, H, and Groundwater, which encompasses the entire Property.

However, because of the complexity of different types of contaminants commingling at the former McClellan AFB, the presence of contamination in the soil, soil gas, sediment, and groundwater, and the large extent of contamination across the former McClellan AFB, the investigation and remediation of contamination at the former McClellan AFB has been subdivided into several projects based on geographic areas and/or media. This subdivision allows for more efficient planning and implementation of each project.

Several RODs have been completed at the former McClellan AFB, as follows:

- No Further Action ROD (AFRPA, 2003) addresses six sites that that have no soil contamination. No remedies were required for these sites.

- Local Reuse Authority Initial Parcel ROD #1 (IP #1 ROD, AFRPA, 2004) addresses non-VOC contaminants in soil at seven sites. The remedies under the IP #1 ROD have been implemented.

- VOC Groundwater ROD (AFRPA, 2007) addresses basewide VOC contamination in groundwater and soil gas in the vadose zone that threatens groundwater. The VOC Groundwater ROD established cleanup requirements for groundwater remedies and SVE that had previously been implemented as removal actions and interim remedies. The remedies specified in the VOC Groundwater ROD have been implemented.

- Non-VOC ROD Amendment (AFRPA, 2009) addresses non-VOC contamination in groundwater. The remedies under the Non-VOC ROD Amendment have been implemented.

- Local Reuse Authority Initial Parcel ROD # 2 (IP #2 ROD, AFRPA, 2008) addresses non-VOC and VOC contaminants in soil and shallow soil gas at 16 sites and VOC contaminants in shallow soil gas at seven sites included in Initial Parcel ROD #1. The remedies under the IP #2 ROD have been implemented.

- Parcel C-6 ROD (EPA, 2009) addresses non-VOC and VOC contaminants in soil and shallow soil gas at 12 sites on the first privatization parcel. The remedies under the Parcel C-6 ROD have been implemented.

- Area of Concern G-1 ROD (AOC G-1 ROD, AFRPA, 2010) addresses non-VOC and VOC contaminants in soil and shallow soil gas at site AOC G-1. The remedy under the AOC G-1 ROD has been implemented.

- Former Skeet Range ROD (Skeet Range ROD, AFRPA, 2011b) addresses cleanup of lead and PAHs in surface soils at the former skeet range. The remedy under the Skeet Range ROD has been implemented.

- Focused Strategic Sites ROD (FSS ROD, AFRPA, 2012c) addresses radiological, non-VOC, and VOC contaminants in soil and shallow soil gas at 11 sites. Collectively, the 11 sites contain the largest volume of wastes at the former McClellan AFB. The remedies under the FSS ROD are being implemented and will be completed when the Consolidation Unit (CU) is closed in 2020. Under the FSS ROD, a CU is being constructed at the former McClellan AFB for disposal of contaminated soil and sediment.

- Local Reuse Authority Initial Parcel ROD #3 (IP #3 ROD, EPA, 2012) addresses non-VOC and VOC contaminants in soil and shallow soil gas. The IP #3 ROD covers 49 sites located in the southwestern and eastern portions of the former McClellan AFB. The remedies under the IP #3 ROD are being implemented and will be completed in 2015.

- Ecological Sites ROD (AFCEC, 2013) addresses contaminants in soil and sediment at 12 sites with ecological habitat, such as creeks and vernal pools. The remedies under the Ecological Sites ROD were implemented and completed during the 2014 field season.

- Follow-on Strategic Sites (FOSS) ROD (AFCEC, 2014) was completed in 2014 and addresses non-VOC and VOC contaminants in soil and shallow soil gas at 88 sites located around and to the west of the airfield. The remedies under the FOSS ROD will be implemented after RAWPs are approved, which is currently scheduled for 2015.

The remaining IRP sites at the former McClellan AFB are grouped geographically or, because of similar attributes, into the following RODs:

- Action Sites ROD (this ROD) addresses non-VOC and VOC contaminants in soil and shallow soil gas at 43 sites located east and south of the airfield.

- Group 4 ROD addresses non-VOC and VOC contaminants in soil and shallow soil gas at 16 sites. The sites are located east of the flight line and north of Palm Avenue. The Group 4 ROD is planned for completion by EPA in 2016.

- Two additional future FOSET #2 RODs will address non-VOC and VOC contaminants in soil and shallow soil gas at the 80 remaining FOSET #2 sites. The sites are located east and south of the runways. The first future FOSET #2 ROD will include 45 sites and is planned for completion by EPA in 2016. The second future FOSET #2 ROD will include 35 sites and is also planned for completion by EPA in 2016.

VOC contamination in groundwater at the FOSET # 2 Action Sites is addressed under the VOC Groundwater ROD that was completed in 2007 (AFRPA, 2007). VOC contamination in the vadose zone that threatens groundwater is also addressed under the VOC Groundwater ROD (AFRPA, 2007). Non-VOCs that may be present in groundwater at the FOSET # 2 Action Sites are addressed in the Non-VOC ROD Amendment (AFRPA, 2009). Deed restrictions specified in the VOC Groundwater ROD and included in the FOSET #2 restrict the use of groundwater, protect the integrity of the groundwater remedial systems at the FOSET # 2 Action Sites, and provide for access to the wells.

Contamination addressed by this ROD is located within the upper 15 feet of soil (with the exception of where soil will be cleaned up to 30 feet bgs at CS T-012 and CS T-021, up to 20 feet bgs at SA 045, and up to 25 feet bgs at CS T-020) and includes sites within OUs A, B, G and H.

2.4.1 Past Removals/Interim Actions

The Air Force has previously undertaken some removal actions to clean up the FOSET # 2 Action Sites and reduce the risks to people and the environment. Radiological contamination in soil (radium 226) has been removed at CS 040, CS B-005, CS T-030, PRL S-006, PRL S-018, PRL S-019, and SA 109 (F2) (CH2MHill 2013, EDi 2013a and 2013b). Based on the Removal Action Reports (RARs) the Air Force has met the radium 226 cleanup goal of 2 picoCuries per gram (pCi/g) at these sites. The California Department of Public Health provided an unrestricted release of these sites with regards to potential radiological concerns. The Air Force is also conducting ongoing cleanup of groundwater contamination in accordance with the VOC Groundwater ROD (AFRPA, 2007). For additional information regarding removal actions, see Attachment B.

Various USTs have been removed from 12 of the FOSET # 2 Action Sites (CS 038, CS T-016, CS T-017, CS T-020, CS T-021, CS T-030, CS T-036, CS T-057, PRL S-017, PRL T-032, SA 045, and SA 100). The status of these UST removals is listed in Attachment B. It should be noted that closure has only been granted at two of the 12 UST removals by the Central Valley Water Board. The remaining USTs will be administratively closed by the Central Valley Water Board.

The FOSET # 2 Action Sites are within the radius of influence of nine SVE systems (Investigation Cluster [IC] 23, IC 27, IC 29, IC 30, IC 31, IC 32, IC 34, IC 35, and IC 37) that were installed by the Air Force under past CERCLA removal actions to address the potential threat to groundwater from VOCs (CH2MHill 2010, 2011, 2012). For SVE system details, see Attachment B.

2.5 SITE CHARACTERISTICS

The Air Force conducted multi-year investigations to characterize the contamination and develop remedial alternatives for the FOSET # 2 Action Sites. Site-specific characterizations are detailed in the Small Volume Sites RICS Addenda and FS (CH2MHill, 2011), the Follow-on Strategic Sites RICS and FS (CH2MHill, 2012), and the Building 252 RICS and FS (CH2MHill, 2010). EPA, DTSC, and the Central Valley Water Board concurred on these findings.

Individual site characteristic summaries of the FOSET # 2 Action Sites addressed in the ROD are presented in Table 2-1 and Attachment D. This table and attachment present information to support the selection of remedial alternatives, including the site features that impacted remedy selection; sources or potential sources of contamination, a summary of the SSG and soil risks, selected remedial alternative(s), and the target excavation volumes. Generally, contamination sources at the FOSET # 2 Action Sites are related to the routine Air Force activities, aviation support operations, vehicle and facility maintenance activities, accidental spills and releases, and onsite storage or disposal of hazardous materials. Remedial alternatives were selected primarily based on the SSG and soil risks and for protection of water quality at each site.

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Table 2-1 Site Characteristics

Site	Site Features	Source/Potential Sources of Contamination	Shallow Soil Gas	Soil[a]	Selected Remedial Alternative(s)[b]	Target Volume[c]
AOC G-3	A portion of a paved aircraft parking apron known as Mat V, a portion of Building 1106 (aircraft maintenance hangar), and surrounding unpaved areas. Activities associated with this site included aircraft washing, maintenance, and parking.	Leaks, spills, and disposal of wastes to the ground surface as a result of aircraft maintenance and parking activities may have impacted the site soil.	Risks are at the high end of the risk management range for unrestricted use and within the risk management range for restricted use. The HI for unrestricted use is greater than 1. The COCs are benzene, methylene chloride, naphthalene, and PCE.	Soil risks, primarily associated with PAHs, are greater than the risk management range for unrestricted use, and within the risk management range for restricted use. The COCs are benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene.	VOC2 (ICs) Non-VOC4a (Excavation and Disposal–Restricted Use)	7,950 cubic yards (restricted)
AOC G-4	A portion of a paved aircraft parking apron known as Mat V and Buildings 1100 (aircraft support and wood shop), 1102 (aircraft maintenance), 1103 (drum storage area), 1105 (hazardous materials storage area), 1106 (open waste storage area), and 1107 (aircraft storage supply area and metals shop).	Releases from the hazardous waste disposal, hazardous materials storage, and aircraft shop and maintenance activities may have impacted the surface and subsurface soil.	Risks are at the high end of the risk management range for unrestricted use, and at the low end of the risk management range for restricted use. The HI for unrestricted use is greater than 1. The COCs are 1,4-DCB, benzene, chloroform, methylene chloride, naphthalene, and PCE.	Soil risks, primarily associated with PAHs, are greater than the risk management range for unrestricted use, and at the high end of the risk management range for restricted use. The HI for unrestricted use is greater than 1. The COCs are benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene, and naphthalene.	VOC3 (ICs/ECs) Non-VOC4a (Excavation and Disposal–Restricted Use)	2,190 cubic yards (restricted)
AOC G-5	A portion of a paved aircraft parking apron known as Mat U, Building 1071 (aircraft maintenance shop), and a cemented and bermed hazardous waste storage area.	Leaks, spills, and disposal of wastes may have impacted the ground surface as a result of aircraft maintenance. Leaks from the drains, sumps, and IWL may have impacted the subsurface soil.	Risks are at the high end of the risk management range for unrestricted use, and at the low end of the risk management range for restricted use. The COCs are benzene, chloroform, naphthalene, PCE, and TCE.	Soil risks, primarily associated with the PAHs, are greater than the risk management range for unrestricted and restricted use. The HI for unrestricted use is greater than 1. The COCs are PCBs (Aroclor-1260), lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene.	VOC2 (ICs) Non-VOC4a (Excavation and Disposal–Restricted Use)	5,480 cubic yards (restricted)
CS 038	Building 475, which was a repair shop for large aircraft reciprocating engines. Several other industrial activities took place within Building 475, including electric motor repair, jet engine repair, welding, metalwork, laser etching, sand-blasting, solvent spray, and storage. An approximately 2,250-gallon solvent UST was also discovered at CS 038, and it was removed on November 3, 2009.	Spills of solvents may have impacted the surface soil, and leaks from USTs, piping, other tanks, the IWL, and possible burial pits may have impacted the subsurface soil.	Risks are greater than the risk management range for both unrestricted and restricted use. The HI is greater than 1 for both the unrestricted and restricted use. CS 038 is within the radius of influence of the IC 37 SVE system, which is anticipated to continue operating. The COCs are benzene, carbon tetrachloride, chloroform, 1,4-DCB, ethylbenzene, hexane, naphthalene, PCE, TCE, 1,3,5-TMB, 1,2,4-TMB, and vinyl chloride.	Soil risks are at the high end of the risk management range for unrestricted use and in the middle of the risk management range for restricted use. The HI for unrestricted use is greater than 1. TPH-G is the only COC in soil as most of the risk is associated with arsenic.	VOC3 (ICs/ECs) Non-VOC4a (Excavation and Disposal–Restricted Use)	230 cubic yards (restricted)

Site	Site Features	Source/Potential Sources of Contamination	Shallow Soil Gas	Soil[a]	Selected Remedial Alternative(s)[b]	Target Volume[c]
CS 040	Eight sludge drying beds that were 190 feet long, 110 feet wide, and 1 foot deep.	Releases from sludge stored at CS 040 may have impacted the subsurface soil, and overflows during rain events may have impacted the surface soil.	Risks are greater than the risk management range for unrestricted use, and within the risk management range for restricted use. The HI for unrestricted use is greater than 1. The COCs are 1,1-DCA, benzene, chloroform, cis-1,2-DCE, naphthalene, PCE, TCE, and vinyl chloride.	Soil risks, primarily associated with PCBs, pesticides, and PAHs, are greater than the risk management range for unrestricted use, and at the high end of the risk management range for restricted use. The HI for unrestricted use is greater than 1. The COCs are PCBs (Aroclor-1260), dieldrin, lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene.	VOC2 (ICs) Non-VOC4a (Excavation and Disposal–Restricted Use)	The combined excavation target volume for adjacent sites CS 040, PRL S-006, and PRL S-019 is 12,248 cubic yards[d] (restricted)
CS B-005	An undeveloped area whose surface soil may have been impacted by petroleum residues in surface runoff from adjacent parking lots.	Buried debris from an undetermined source may have impacted the subsurface soil	Risks are within the risk management range for unrestricted use, and below the risk management range for restricted use. The COC is benzene.	Soil risks, driven by metals and dioxins/furans, exceed the risk management range for unrestricted use and are within the risk management range for restricted use. The HI is greater than 1 for both unrestricted and restricted use. The COCs are antimony, arsenic, benzo(a)pyrene, cadmium, cobalt, copper, lead, manganese, zinc, and dioxins/furans.	VOC2 (ICs) Non-VOC4a (Excavation and Disposal–Restricted Use)	3,328 cubic yards[d] (restricted)
CS S-007	The former location of water cooling ponds, used to cool water from the reciprocating engine test buildings, and IWTP #3. A free oil separator, oil sump, clarifying tank, air saturation tank, flotation tank, 60,000-gallon holding tank, bleed-off tank, two backup holding tanks, raw waste holding tank, two sand filters, cooling pond, and underground holding tank were associated with IWTP #3.	Releases from the cooling pond, site tanks, and associated underground piping may have impacted the surface and subsurface soil.	Risks are greater than the risk management range for unrestricted use, and within the risk management range for restricted use. The HI for unrestricted use is greater than 1. The COCs are benzene, ethylbenzene, naphthalene, PCE, and TCE.	Soil risks, driven by a single elevated naphthalene detection, exceed the risk management range for both unrestricted and restricted use. The HI is greater than 1 for both unrestricted and restricted use. Excluding naphthalene, soil risks would be within the risk management range for restricted use. The COCs are benzo(a)pyrene, benzo(a)anthracene, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene, naphthalene, 1,2-DCB, 1,3-DCB, 1,4-DCB, TPH-D, and lead.	VOC3 (ICs/ECs) Non-VOC4a (Excavation and Disposal–Restricted Use)	420 cubic yards (restricted)
CS S-024	A concrete pad used for aircraft cleaning, two sumps that collected runoff from the aircraft washing operations, an unlined drainage ditch, Building 375 (which included aircraft washing, paint stripping, and fuel tank de-sealing), three paint remover ASTs and one solvent AST, Building 377 (support building), and Building 378 (chemical storage area).	Spills and releases from hazardous materials storage areas, solvent storage tanks, process work areas, media bulking locations, and transformers may have impacted the surface soil. Leaks from sumps, drains, and IWL and stormwater lines may have impacted the subsurface soil	Risks are within the risk management range for both unrestricted and restricted use. The COCs are TCE, ethylbenzene, PCE, and benzene.	Soil risks, driven by PCBs, are within the risk management range for both unrestricted and restricted use. The HI for unrestricted use is greater than 1. TPH-G exceeded the screening levels for protection of groundwater and surface water quality. The COCs are PCBs (Aroclor-1260) and TPH-G.	VOC2 (ICs) Non-VOC4a (Excavation and Disposal–Restricted Use)	140 cubic yards (restricted)
CS S-026	Building 473 and the surrounding area. Building 473 was used for aircraft engine testing and included a hazardous waste tank. Materials handled at CS S-026 included fuels, oils, VOCs, paints, heavy metals, aliphatic naphtha, toluene, and lead.	Releases from fuel handling and jet engine testing, spray booth operations, and other operations at Building 473 may have impacted the surface. Leaks from the IWL and associated drains and piping may have impacted the subsurface.	Risks are greater than the risk management range for unrestricted use and within the risk management range for restricted use. The HI is greater than 1 for both unrestricted and restricted use. The COCs are hexachlorobutadiene, 1,2,4-TMB, 1,3,5-TMB, carbon tetrachloride, and PCE.	Soil risks are within the risk management range for both unrestricted and restricted use. The HI for unrestricted use is greater than 1. TPH-D and TPH-G exceeded screening levels for protection of groundwater quality. The COCs are TPH-D and TPH-G.	VOC3 (ICs/ECs) Non-VOC4a (Excavation and Disposal–Restricted Use)	120 cubic yards (restricted)

Site	Site Features	Source/Potential Sources of Contamination	Shallow Soil Gas	Soil[a]	Selected Remedial Alternative(s)[b]	Target Volume[c]
CS T-012	Reportedly the location of a former oil-solvent UST associated with Building 342.	Leaks from the UST may have impacted the subsurface soil.	No VOCs were detected in the SSG samples collected at CS T-012; therefore, no COCs were identified in SSG, and the SSG risk is below the risk management range for unrestricted use.	Soil risks, driven by PAHs, are within the risk management range for unrestricted use and at the low end of the risk management range for restricted use. The HI for unrestricted use is greater than 1. TPH-D and TPH-G exceeded screening levels for protection of groundwater quality. The COCs are benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, TPH-D, and TPH-G.	Non-VOC4a (Excavation and Disposal–Restricted Use)	The combined excavation target volume for adjacent sites CS T-012 and CS T-021 is 870 cubic yards (restricted)
CS T-016	Tank Farm 2, which consisted of four 25,000-gallon USTs; one 12,000-gallon UST; and two ASTs. The 25,000-gallon tanks contained diesel or JP-4 jet fuel, and the 12,000-gallon tank contained waste fuel. Little information is available for the ASTs, but an assessment conducted in 1991 indicated they were labeled as containing jet fuel.	Leaks from the ASTs and spills during fuel delivery may have impacted the surface soil. Leaks from the USTs and potentially contaminated soil used to backfill the UST excavations may have impacted the subsurface.	Risks are within the risk management range for both unrestricted and restricted use. The COCs are chloroform, naphthalene, ethylbenzene, and benzene.	Soil risks are at the high end of the risk management range for unrestricted use and within the risk management range for restricted use. The HI for unrestricted use is greater than 1. TPH-D and TPH-G exceeded screening levels for protection of groundwater quality. The COCs are TPH-D and TPH-G.	VOC2 (ICs) Non-VOC4a (Excavation and Disposal–Restricted Use)	210 cubic yards (groundwater)
CS T-017	Encompasses the western portion of former Tank Farm 3, roughly 13,000 square feet in area. CS T-017 contained nine 25,000-gallon USTs. Six of the USTs were used to store No. 2 diesel fuel and three were used to store aviation fuel and gear oil. The USTs have been removed, but they have not been granted closure status.	Leaks from the USTs and associated piping may have impacted the subsurface soil. Spills during unloading operations and from drum storage activities may have impacted the surface soil.	Risks are within the risk management range for unrestricted use, and below the risk management range for restricted use. No COCs were identified in SSG because concentrations were relatively low, soil gas samples were collected from biased locations where contamination would likely have been identified, and a small number of VOCs exceeded screening levels.	Soil risks are at the high end of the risk management range for unrestricted use and within the risk management range for restricted use. The HI for unrestricted use is greater than 1. TPH-G exceeded the screening level for protection of groundwater quality. The COCs are TPH-G, benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, and chrysene.	Non-VOC4a (Excavation and Disposal–Restricted Use)	170 cubic yards (restricted)
CS T-020	This site covers approximately 10,000 square feet and includes the former location of Tank Farm No. 6 and the foundation of demolished Building 418 (a former pump house). Tank Farm No. 6 was composed of seven USTs that were installed between 1951 and 1955. The USTs stored liquid fuels and wastes and ranged in capacity from 11,000 gallons to 27,000 gallons. All seven tanks were removed in 1990 along with impacted soil from UST and piping leaks, but the USTs have not been granted closure status.	The USTs contained a combination of solvents, waste solvents, gasoline, kerosene, alcohol, and diesel. All seven tanks were removed in 1990 along with impacted soil from UST and piping leaks, but the USTs have not been granted closure status.	Risks are at the low end of the risk management range for unrestricted use, and below the risk management range for restricted use. The COC is benzene. CS T-020 is within the radius of influence of the IC 37 SVE system, which is anticipated to continue operating.	Soil risks are below the risk management range for unrestricted and restricted use. The HI is greater than 1 for unrestricted use. The COCs are TPH-D and TPH-G.	VOC3 (ICs/ECs) Non-VOC4a (Excavation and Disposal–Restricted Use)	1,220 cubic yards (groundwater)
CS T-021	Former Tank Farm 3-East, which contained five 12,500-gallon USTs, containing oils and fuels, Stoddard solvent, and alcohol. The tanks were removed in 1989, but they have not been granted closure.	Leaks from the UST may have impacted the subsurface soil. Releases during filling and emptying activities at the tank farm may have impacted the surface soil.	No VOCs were detected in the SSG samples collected at CS T-021; therefore, no COCs were identified in SSG, and the SSG risk is below the risk management range for unrestricted use.	Soil risks, driven by PAHs, are within the risk management range for unrestricted use and at the low end of the risk management range for restricted use. The HI for unrestricted use is greater than 1. TPH-D and TPH-G exceeded screening levels for protection of groundwater quality. The COCs are benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, TPH-D, and TPH-G.	Non-VOC4a (Excavation and Disposal–Restricted Use)	The combined excavation target volume for adjacent sites CS T-012 and CS T-021 is 870 cubic yards (restricted)

Site	Site Features	Source/Potential Sources of Contamination	Shallow Soil Gas	Soil[a]	Selected Remedial Alternative(s)[b]	Target Volume[c]
CS T-030	A group of six solvent USTs, ranging from 250 to 1,500 gallons, located immediately south of Building 252. Two of the UST have been removed and the other four were filled with concrete and abandoned in place.	Leaks from the USTs may have impacted the subsurface soil.	Risks are below the risk management range for unrestricted and restricted use. No COCs have been identified.	Soil risks, driven by mercury, are within the risk management range for both unrestricted and restricted use. The HIs for both unrestricted and restricted use are greater than 1. The COCs are mercury and PAHs.	Non-VOC4a (Excavation and Disposal–Restricted Use)	The combined excavation target volume for adjacent sites CS T-030 and PRL S-018 is 3,243 cubic yards[d] (restricted)
CS T-036	The location of former UST 344, a 500-gallon steel UST used to store Stoddard solvent adjacent to the northwest corner of Building 344. The tank was removed in 1989. The excavation was filled with clean soil and paved over.	Soil samples concluded that the soil within the excavation was not contaminated, and UST 344 was granted closure status by the Central Valley Water Board.	Risks are below the risk management range for unrestricted and restricted use. No COCs have been identified.	Soil risks, driven by pesticides, are at the upper end of the risk management range for unrestricted use and within the risk management range for restricted use. The COC is dieldrin.	Non-VOC4a (Excavation and Disposal–Restricted Use)	110 cubic yards (restricted)
CS T-047	A former underground OWS and an associated 10,000-gallon AST. Releases resulting from leaks in the OWS and associated piping may have impacted the subsurface soil.	Releases resulting from leaks in the AST or when waste oil was removed from it may have impacted the surface soil.	Risks are greater than the risk management range for unrestricted use but within the risk management range for restricted use. The HI is greater than 1 for unrestricted use. The COCs are benzene, 1,1-DCA, chloroform, cis-1,2-DCE, vinyl chloride, TCE, and PCE.	Soil risks, driven by naphthalene and 2-methylnaphthalene in a single sample, are within the risk management range for unrestricted and restricted use. The HI is greater than 1 for unrestricted use. TPH-D and TPH-G exceeded screening levels for protection of groundwater quality. The COCs are naphthalene, 2-methylnaphthalene, TPH-D, and TPH-G.	VOC2 (ICs) Non-VOC4a (Excavation and Disposal–Restricted Use)	1,290 cubic yards (restricted)
CS T-057	Used for storage of unknown materials and fire training. Building 431, a former jet engine testing facility, was also located at this site. A 1,000-gallon wastewater UST was located about 40 feet north of the northern corner of Building 431. The UST was removed in 1988, but it was not granted closure status. Two 3,000-gallon ASTs and a 1,000-gallon AST were formerly located on the northwestern side of Building 431.	Leaks from the UST and IWL may have impacted the subsurface soil. Leaks from the ASTs and discharges during fire training and jet engine testing activities may have impacted the surface soil.	Risks are greater than the risk management range for unrestricted use and within the risk management range for restricted use. The HI for unrestricted use is greater than 1. The COCs are 1,2,4-TMB; 1,3,5-TMB; 1,2-DCA; benzene; chloroform; cis-1,2-DCE; ethylbenzene; naphthalene; PCE; TCE; and vinyl chloride.	Soil risks, driven by arsenic and dioxins/furans, are greater than the risk management range for unrestricted use and within the risk management range for restricted use. The HI for unrestricted use is greater than 1. Lead was detected at concentrations above the unrestricted screening level, but below the restricted screening level. The COCs are dioxins/furans and lead.	VOC3 (ICs/ECs) Non-VOC4a (Excavation and Disposal–Restricted Use)	The combined excavation target volume for adjacent sites CS T-057, SA 080, and SA 107 is 101 cubic yards (restricted and surface water)
PRL S-001	Building 343, which covers approximately half of the site's 32,400 square feet. Building 343 was used for plating, battery storage and maintenance, sandblasting, buffing, and lacquer operations. Building 343 was also identified as a pretreatment facility, which included chromium and cadmium recovery and residual chromium reduction.	Releases from leaks in the trenches beneath the plating tanks may have impacted the subsurface soil.	Risks are within the risk management range for both unrestricted and restricted use. The COCs are benzene, carbon tetrachloride, chloroform, ethylbenzene, naphthalene, PCE, and TCE.	Soil risks are within the risk management range for both unrestricted and restricted use. The HI for unrestricted use is greater than 1. The COCs are cadmium and lead.	VOC2 (ICs) Non-VOC4a (Excavation and Disposal–Restricted Use)	80 cubic yards (restricted)
PRL S-002	Building 447, which stored paint and oil. After 1970, the northern portion of the building received fuels used at the base and distributed them to other locations on base. A transformer was also identified near the northeastern corner of the building.	Releases of contaminants stored at the site or transformer oil leaks may have impacted the surface soil.	Risks are within the risk management range for unrestricted use and less than the risk management range for restricted use. No COCs have been identified.	Soil risks, primarily driven by PCBs, are at the high end of the risk management range for unrestricted use and within the risk management range for restricted use. The HI for unrestricted use is greater than 1. The COCs are PCBs (Aroclor-1260), benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene.	Non-VOC4a (Excavation and Disposal–Restricted Use)	120 cubic yards (restricted)

Site	Site Features	Source/Potential Sources of Contamination	Shallow Soil Gas	Soil[a]	Selected Remedial Alternative(s)[b]	Target Volume[c]
PRL S-006	Former IWTP #1, which received wastewater containing fuels, oils, solvents, chromic acid, and phenols from base operations until 1972.	Releases from leaks in ASTs or USTs and associated piping may have impacted the surface and subsurface soil.	Risks are greater than the risk management range for unrestricted use, and within the risk management range for restricted use. The HI is greater than 1 for unrestricted use. The COCs are 1,1- DCA, benzene, chloroform, cis-1,2-DCE, naphthalene, PCE, TCE, and vinyl chloride.	Soil risks, primarily associated with PCBs, pesticides, and PAHs, are greater than the risk management range for unrestricted use, and at the high end of the risk management range for restricted use. The HI is greater than 1 for unrestricted use. The COCs are PCBs (Aroclor-1260), dieldrin, lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene.	VOC2 (ICs) Non-VOC4a (Excavation and Disposal–Restricted Use)	The combined excavation target volume for adjacent sites CS 040, PRL S-006, and PRL S-019 is 12,248 cubic yards[d] (restricted)
PRL S-017	Building 251, which was used primarily for aircraft maintenance. Aircraft propellers, engines, wings, fuselages, landing gear, and electrical systems were repaired in Building 251. Oil, grease, hydraulic fluid, gasoline, jet fuel, and solvents were used during these maintenance activities. Two washracks, several USTs, ASTs, an OWS, and an oil sump were located near Building 251.	Leakage from the gasoline USTs and diesel ASTs, releases from the oil sump, OWS, washracks, paint booth, operations in the machine shop, and aircraft maintenance may have impacted the site soil.	Risks are within the risk management range for unrestricted use, and at the low end of the risk management range for restricted use. The COCs are benzene, carbon tetrachloride, chloroform, naphthalene, and TCE.	Soil risks are within the risk management range for both unrestricted and restricted use. TPH-D and TPH-G are COCs at PRL S-017.	VOC2 (ICs) Non-VOC4a (Excavation and Disposal–Restricted Use)	530 cubic yards (restricted)
PRL S-018	Buildings 252 (a former repair shop and radium dial painting facility) and 253 (a small storage outbuilding attached to the southeast portion of Building 252).	Releases may have impacted the site soil.	Risks are below the risk management range for unrestricted and restricted use. No COCs have been identified.	Soil risks, driven by mercury, are within the risk management range for both unrestricted and restricted use. The HI is greater than 1 for both unrestricted and restricted use. The COC is mercury.	Non-VOC4a (Excavation and Disposal–Restricted Use)	The combined excavation target volume for adjacent sites CS T-030 and PRL S-018 is 3,243 cubic yards[d] (restricted)
PRL S-019	Building 326, which was used from 1960 to 1979 by the Entomology Unit to mix and store various herbicides and pesticides, mostly in powder form. The basement of the building housed fire boxes, which were used for an unspecified length of time to incinerate small quantities of solid wastes. One drain in the basement of Building 326 is connected to the IWL.	Surface releases of pesticide and herbicide compounds in the area surrounding Building 332 and subsurface releases resulting from leaks in the drain or sump in the basement of Building 332 may potentially have occurred.	Risks are greater than the risk management range for unrestricted use but within the risk management range for restricted use. The HI is greater than 1 for unrestricted use. The COCs are 1,1-DCA; benzene; chloroform; cis-1,2-DCE; naphthalene; PCE; TCE; and vinyl chloride.	Soil risks, primarily associated with PCBs, pesticides, and PAHs, are greater than the risk management range for unrestricted use and at the high end of the risk management range for restricted use. The HI is greater than 1 for unrestricted use. The COCs are PCBs (Aroclor-1260), dieldrin, lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene.	VOC2 (ICs) Non-VOC4a (Excavation and Disposal–Restricted Use)	The combined excavation target volume for adjacent sites CS 040, PRL S-006, and PRL S-019 is 12,248 cubic yards[d] (restricted)
PRL S-025	Building 440, which housed a transformer shop, a ball-bearing shop, and a rubber repair shop. The ball bearings were cleaned using Stoddard solvent, TCE, and PCE.	Transformer oil spills, releases from the sump located just outside the rubber repair shop, or releases from the solvent line and pit may have impacted the soil at PRL S-025.	Risks are within the risk management range for unrestricted use and less than the risk management range for restricted use. No COCs have been identified.	Soil risks, driven by PCBs, are within the risk management range for unrestricted use and at the low end of the risk management range for restricted use. The HI is greater than 1 for unrestricted use. TPH-D and TPH-G exceeded screening levels for protection of groundwater and surface water quality. The COCs are PCBs (Aroclors-1254 and 1260), TPH-D, and TPH-G.	Non-VOC4a (Excavation and Disposal–Restricted Use)	40 cubic yards (restricted, surface water, groundwater)

Site	Site Features	Source/Potential Sources of Contamination	Shallow Soil Gas	Soil[a]	Selected Remedial Alternative(s)[b]	Target Volume[c]
PRL S-036	Former Building 402 (chemical storage), former Building 410 (garbage truck repair facility), three 250-gallon diesel and gasoline ASTs, and an oil and automotive fluid drum storage area.	Spills from building operations, ASTs, and drums may have impacted the soil surface.	Risks are within the risk management range for both unrestricted and restricted use. No COCs have been identified.	Soil risks, driven by PCBs, are within the risk management range for unrestricted use and less than the risk management range for restricted use. The HI is greater than 1 for unrestricted use. However, PCBs exceed surface water protection screening levels. The COC is PCBs (Aroclor-1260).	Non-VOC4b (Excavation and Disposal–Unrestricted Use)	90 cubic yards (surface water)
PRL S-043	A former aircraft washrack.	Releases from aircraft washing and maintenance; emergency fuel dumps or chemical spills; and repaving and resealing of the apron may have impacted the surface soil. Releases from the IWL and drainage system may have impacted the subsurface.	Risks are within the risk management range for both unrestricted and restricted use. The COC is PCE.	Soil risks, driven by PAHs, are greater than the risk management range for unrestricted use and are within the risk management range for restricted use. The HI is greater than 1 for unrestricted use. TPH-G exceeded screening levels for protection of groundwater quality. The COCs are benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-c,d)pyrene, chrysene, and TPH-G.	VOC2 (ICs) Non-VOC4b (Excavation and Disposal–Unrestricted Use)	190 cubic yards (surface water, groundwater)
PRL S-044	The southern portion of a paved aircraft parking apron known as MAT U (approximately 750 feet wide by 1,300 feet long and 18 inches thick). Aircraft maintenance, fueling, washing, painting, and de-painting occurred onsite beginning in 1957. An aircraft wash area was located in the southeastern corner of the site. Four east-west-running petroleum pipelines ran beneath the site. Maintenance hangars line the east side of the site.	Releases from aircraft-related maintenance, painting, or washing may have impacted the surface soil. Leaks from the pipelines or IWL may have impacted the subsurface.	Risks are within the risk management range for both unrestricted and restricted use. The COCs are benzene, naphthalene, and TCE.	Soil risks, driven by PAHs, are greater than the risk management range for unrestricted use and within the risk management range for restricted use. The HI is greater than 1 for unrestricted use. The COCs are PCBs (Aroclor-1260), benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene, and lead.	VOC2 (ICs) Non-VOC4a (Excavation and Disposal–Unrestricted Use)	9,020 cubic yards (surface water)
PRL S-045	A paved apron (Apron 7310) and two aircraft hangars (Buildings 877 and 878); it is also known as MAT C. Routine aircraft maintenance was performed on the apron and in the hangars from 1964 to 1992. Waste oil and hydraulic fluid were collected in bowsers and transferred to 55-gallon drums stored in the hazardous waste staging area in the northeastern portion of the apron.	Spills and leaks to the ground surface from a hazardous materials storage area, ASTs, transformers, and various aircraft maintenance activities may have impacted the surface soil. Leaks from the sump and OWS may have impacted the subsurface.	Risks are within the risk management range for unrestricted use and less than the risk management range for restricted use. The COCs are benzene, 1,2-DCA, chloroform, and naphthalene.	Soil risks are within the risk management range for both unrestricted and restricted use. The HI is greater than 1 for unrestricted use. PCBs and PAHs exceeded surface water protection screening levels. The COCs are benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and PCBs (Aroclors-1254 and 1260).	VOC2 (ICs) Non-VOC4b (Excavation and Disposal–Unrestricted Use)	660 cubic yards (surface water)
PRL T-032	The location of Building 1023, which served as a hangar for light maintenance activities. Two 550-gallon USTs just south of Building 1023 were removed in 1987 and received closure from the Central Valley Water Board on March 6, 1998.	Releases from the former USTs and leaks from the floor drains and/or sanitary sewer related to the maintenance activities may have impacted the subsurface soil.	Risks are within the risk management range for both unrestricted and restricted use. The HI is greater than 1 for both unrestricted and restricted use. The COCs are 1,2,4-TMB, 1,3,5-TMB, benzene, ethylbenzene, m,p-xylene, methylene chloride, and naphthalene.	Soil risks are greater than the risk range for unrestricted use and within the risk range for restricted use. The HI is greater than 1 for unrestricted use. The COCs are 1-methylnaphthalene, benzo(a)pyrene, naphthalene, TPH-D, and TPH-G.	VOC3 (ICs/ECs) Non-VOC4a (Excavation and Disposal–Restricted Use)	5,080 cubic yards (restricted)

Site	Site Features	Source/Potential Sources of Contamination	Shallow Soil Gas	Soil[a]	Selected Remedial Alternative(s)[b]	Target Volume[c]
SA 004	Building 650 (aircraft parts storage, paint booths, and radar equipment installation) and two outdoor storage areas west of the building. A small paved hazardous waste staging area, immediately west of Building 650B, was used to store empty containers, soiled rags, and waste paper and chemicals from the paint shop. An unpaved storage area, located 350 feet west of Building 650D, was used to store electrical transformers.	Leaks or spills from stored electrical transformers, the loading dock, and hazardous waste storage area west of Building 650B; and releases from paint booth activities at Buildings 650B and 650C may have impacted the surface soil. Leaks from the nearby IWL may have impacted the subsurface soil	Risks are greater than the risk management range for unrestricted use and within the risk management range for restricted use. The HI is greater than 1 for unrestricted use. The COCs are naphthalene, 2-methylnaphthalene, and PCE.	Soil risks, driven by PCBs, are greater than the risk management range for unrestricted and within the risk management range for restricted use. The HI is greater than 1 for both unrestricted and restricted use. The COC is PCBs (Aroclor-1260).	VOC2 (ICs) Non-VOC4b (Excavation and Disposal–Unrestricted Use)	30 cubic yards (surface water)
SA 045	Building 339 (barracks, administrative offices, and the Western Field Office); it is the former location of a 500-gallon diesel UST. A transformer was also located northeast of Building 339.	Leaks from the UST and associated piping may have impacted the subsurface, and leaks from the transformer may have impacted the surface soil.	Risks are within the risk management range for unrestricted use and less than the risk management range for restricted use. No COCs have been identified.	Soil risks, driven by PAHs, are within the risk management range for both unrestricted and restricted use. The HI is greater than 1 for unrestricted use. TPH-D and TPH-G exceeded screening levels for protection of groundwater quality. The COCs are naphthalene, TPH-D, TPH-G, 1-methylnaphthalene, and 2-methylnaphthalene.	Non-VOC4a (Excavation and Disposal–Restricted Use)	2,180 cubic yards (restricted)
SA 049	Buildings 262A (administrative work area) and 262B (power-generating plant) and the former and present locations of several USTs and ASTs (storing diesel, sodium hydroxide, and oil).	Spills from the ASTs, drums of stored materials, batteries, and power-generation equipment may have impacted the surface soil. Releases from USTs and associated piping may have impacted the subsurface soil.	No VOCs were detected in SSG at SA 049; therefore, no COCs have been identified.	Soil risks, driven by PCBs and PAHs, are at the high end of the risk management range for unrestricted use and within the risk management range for restricted use. The HI is greater than 1 for unrestricted use. The COCs are PCBs (Aroclor-1260), benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene.	Non-VOC4a (Excavation and Disposal–Restricted Use)	20 cubic yards (restricted)
SA 055	Building 324 and former Building 340. Buildings 324 and 340 were built in 1960 and were asphalt-paved, open-sided and bermed laboratory waste staging areas. Compounds stored at SA 055 include fuels, oils, solvents, cyanide, paints, acids, bases, oil containing PCBs, and metals.	Spills from the storage of hazardous materials may have impacted the surface soil.	Risks are within the risk management range for unrestricted use and are at the low end of the risk management range for restricted use. No COCs have been identified because only a small volume of soil has been impacted by VOCs.	Soil risks are at the low end of the risk management range for unrestricted use and less than the risk management range for restricted use. The HI is greater than 1 for unrestricted use. Lead was detected above the unrestricted CL, but below the restricted CL. Lead and PCBs (Aroclor-1260) were detected above the screening levels for surface water quality protection, and are considered COCs.	Non-VOC4b (Excavation and Disposal–Unrestricted Use)	30 cubic yards (surface water)
SA 060	A vehicle washrack that consisted of a concrete slab area with an IWL drain in the center of the wash area.	Releases from the former washrack and associated piping, from drum storage, and from overflow when the IWL drain clogged may have impacted the soil at SA 060.	Risks are within the risk management range for unrestricted use and less than the risk management range for restricted use. No COCs have been identified.	Soil risks are less than the risk management range for both scenarios. The HI is greater than 1 for unrestricted use. TPH-D was detected above screening levels for protection of groundwater quality and surface water, and is considered a COC in soil.	Non-VOC4a (Excavation and Disposal–Restricted Use)	40 cubic yards (restricted)
SA 063	Building 350, which was used as administrative offices and a machine and light electrical maintenance shop. A transformer was identified east of the former building location.	Releases from former machine shop and electrical maintenance operations or leaks from the transformer may have impacted the surface soil.	Risks are at the low end of the risk management range for unrestricted use and less than the risk management range for restricted use. No COCs have been identified.	Soil risks, driven by PCBs (Aroclor-1260), are greater than the risk management range for both unrestricted and restricted use. The HI is greater than 1 for both unrestricted and restricted use. The COC is PCBs (Aroclor-1260).	Non-VOC4a (Excavation and Disposal–Restricted Use)	400 cubic yards (restricted)

Site	Site Features	Source/Potential Sources of Contamination	Shallow Soil Gas	Soil[a]	Selected Remedial Alternative(s)[b]	Target Volume[c]
SA 066	A motor pool site that consisted of Building 357.	Releases resulting from activities conducted during operation of the motor pool may have impacted the site soil.	Risks are greater than the risk management range for unrestricted and restricted use. The HI is greater than 1 for both unrestricted and restricted use. The COCs are benzene, carbon tetrachloride, chloroform, 1,4-DCB, ethylbenzene, naphthalene, PCE, TCE, 1,2,4-TMB, and 1,3,5-TMB.	Soil risks are less than the risk management range for unrestricted and restricted use. TPH-D exceeded screening levels for protection of groundwater quality and is considered a COC in soil.	VOC3 (ICs/ECs) Non-VOC4a (Excavation and Disposal–Restricted Use)	30 cubic yards (restricted)
SA 080	A grassy field where drummed chemicals were previously stored. In 1987, a contractor reported discharging hazardous rinse water and other wastes to the ground surface at SA 080. By 1987, all drums were removed from the site, and contaminated surface soil was removed and backfilled with clean soil.	Leaks in fuel distribution line and associated supply lines and releases of chemicals from surface spills at hazardous materials storage area may have impacted the SA 080 soil.	Risks are greater than the risk management range for unrestricted use and at the high end of the risk management range for restricted use. The HI is greater than 1 for unrestricted use. The COCs are 1,2,4-TMB; 1,3,5-TMB; 1,2-DCA; benzene; chloroform; cis-1,2-DCE; ethylbenzene; naphthalene; PCE; TCE; and vinyl chloride.	Soil risks, driven by arsenic and dioxins/furans, are greater than the risk management range for unrestricted use and within the risk management range for restricted use. The HI is greater than 1 for unrestricted use. Lead was detected at concentrations above the unrestricted CLs, but below the restricted screening level. The COCs are dioxins/furans and lead.	VOC3 (ICs/ECs) Non-VOC4a (Excavation and Disposal–Restricted Use)	The combined excavation target volume for adjacent sites CS T-057, SA 080, and SA 107 is 101 cubic yards (restricted)
SA 096	Building T-410 (reclamation building) and a hazardous materials staging area for the motor pool. In 1968, the foundation of Building T-410 was covered by asphalt, after which the area was used as a solid hazardous waste staging area. Drums in this area were observed to contain antifreeze, motor oil, gear lube oil, and heavy duty grease. Two 500-gallon USTs or sumps were located adjacent to SA 096.	Spills from the hazardous waste storage may have impacted the surface soil, and leaks from the two 500-gallon USTs/sumps and the concrete IWL sump may have impacted the subsurface	Risks are within the risk management range for unrestricted use and less than the risk management range for restricted use. No COCs have been identified.	Soil risks are within the risk management range for both unrestricted and restricted use. TPH-D and TPH-G were detected above the screening levels for protection of groundwater quality, and are considered COCs.	Non-VOC4a (Excavation and Disposal–Restricted Use)	290 cubic yards (groundwater)
SA 097	A bermed, concrete-covered hazardous waste staging area and the demolished Building 426 (a former steam-cleaning washrack). An OWS was also located beneath Building 426. Hazardous wastes handled at the SA 097 hazardous waste staging area include solvents, empty lubricant aerosol cans, paints, caustic paint sludge, spent paint cans, and contaminated rags.	Releases from cracks in the floor of the bermed, concrete-covered hazardous material staging area may have impacted surface soil, and releases from the former washrack may have impacted the subsurface.	Risks for unrestricted use are greater than the risk management range and are at the upper end of the risk management range for restricted use. The HI is greater than 1 for unrestricted use. SA 097 is within the estimated radius of influence of a new SVE well to be installed as part of the IC 34 SVE system. The COCs are cis-1,2-DCE, PCE, and TCE.	Soil risks are within the risk management range for both unrestricted and restricted use. The HI is greater than 1 for unrestricted use. Lead was detected above the unrestricted use screening levels but is less than the restricted use screening level. TPH-D was detected above screening levels for protection of groundwater quality. The COCs are cadmium, lead, PCBs (Aroclors-1254 and 1260), TPH-D, and 4-chloroaniline.	VOC3 (ICs/ECs) Non-VOC4a (Excavation and Disposal–Restricted Use)	40 cubic yards (groundwater, surface water)
SA 100	Building 332 (paper shredder), a 500-gallon diesel UST, an incinerator, a diesel AST, and two ASTs with unknown contents. The UST was removed in 1992, but it has not been granted closure status.	Releases from the incinerator and ASTs may have impacted the surface soil, and releases from the UST and industrial waste sump may have impacted the subsurface.	Risks are at the high end of the risk management range for unrestricted use and are within the risk management range for restricted use. The COCs are benzene, chloroform, and carbon tetrachloride.	Soil risks, driven by dioxins/furans, are greater than the risk management range for unrestricted use and within the risk management range for restricted use. The HI is greater than 1 for unrestricted use. Lead and dioxins/furans exceeded surface water protection screening levels, and are the COCs identified at SA 100.	VOC2 (ICs) Non-VOC4a (Excavation and Disposal–Restricted Use)	20 cubic yards (restricted)

Site	Site Features	Source/Potential Sources of Contamination	Shallow Soil Gas	Soil[a]	Selected Remedial Alternative(s)[b]	Target Volume[c]
SA 107	Two jet engine test stands. Operations at SA 107 routinely used fuels, oils, and solvents.	Leaks and spills may have impacted the site soil.	Risks are greater than the risk management range for unrestricted use and at the high end of the risk management range for restricted use. The HI is greater than 1 for unrestricted use. The COCs are 1,2,4-TMB; 1,3,5-TMB; 1,2-DCA; benzene; chloroform; cis-1,2-DCE; ethylbenzene; naphthalene; PCE; TCE; and vinyl chloride.	Soil risks, driven by arsenic and dioxins/furans, are greater than the risk management range for unrestricted use and within the risk management range for restricted use. The HI is greater than 1 for unrestricted use. Lead was detected at concentrations above the unrestricted screening level, but below the restricted screening level. The COCs are dioxins/furans and lead.	VOC3 (ICs/ECs) Non-VOC4a (Excavation and Disposal–Restricted Use)	The combined excavation target volume for adjacent sites CS T-057, SA 080, and SA 107 is 101 cubic yards (surface water)
SA 109 (F2)	A portion of Magpie Creek.	Runoff, storm drainage, discharges from nearby contaminated sites, and leaks in the corrugated liner within the creek may have impacted the surface soil.	COCs were not identified at SA 109 (F2) because this site is not considered a source of VOCs in soil gas.	Soil risks, driven by cadmium and PCBs, are at the high end of the risk management range for unrestricted use and within the risk management range for restricted use. The HI is greater than 1 for unrestricted use. Aroclors-1254 and -1260 exceed the residential and industrial CLs, as well as the protection of surface water screening level. Lead was also detected above unrestricted, but below restricted use CLs. The COCs identified in soil are cadmium, alpha chlordane, gamma chlordane, DDD, DDE, DDT, dieldrin, lead, and PCBs (Aroclors-1254 and 1260).	Non-VOC4b (Excavation and Disposal–Unrestricted Use)	2,778 cubic yards[d] (surface water)

Notes:

a) The term “screening level” is used in the soil discussion, which refers to the values that were used in the RICS/FS to determine risk and designate COCs. This evaluation included human health levels, protection of surface water levels, and protection of groundwater levels.
b) The remedy selections are based on the SSG and soil risks, as detailed in Section 2.12.4.
c) The parenthetical notations in this column indicate the basis for the target volume. For example, “(restricted)” indicates the target volume is based on the volume of soil that exceeds restricted use cleanup levels, while “(groundwater)” indicates the target volume is based on the volume of soil that exceeds cleanup levels for the protection of groundwater quality. Similarly, “(surface water)” indicates that the target volume is based on the volume of soil that exceeds cleanup levels established by the Central Valley Water Board for the protection of surface water.
d) Indicates the costs and volumes for the remedy were revised based on completion of the SVS and Building 252 Radiological NTCRA.

AOC area of concern
AST aboveground storage tank
COC contaminant of concern
CS confirmed site
DCA dichloroethane
DCB dichlorobenzene
DCE dichloroethene
DDD dichlorodiphenyldichloroethane
DDE dichlorodiphenyldichloroethylene
DDT dichlorodiphenyltrichloroethane
EC engineered control
F2 the portion of the site within FOSET # 2
HI Hazard Index
IC institutional control
IC (#) investigation cluster (used with a numeral to identify SVE investigation/cleanup areas)
IWL industrial wastewater line
IWTP industrial wastewater treatment plant
No. number
OWS oil and water separator
PAH polycyclic aromatic hydrocarbon
PCBs polychlorinated biphenyls

PCE	tetrachloroethene
PRL	potential release location
SA	study area
SSG	shallow soil gas
SVE	soil vapor extraction
TCE	trichloroethene
TMB	trimethylbenzene
TPH-D	total petroleum hydrocarbons as diesel
TPH-G	total petroleum hydrocarbons as gasoline
UST	underground storage tank
VOC	volatile organic compound

2.5.1 Topography, Geology, and Hydrology

The former McClellan AFB is located in the Sacramento Valley. The regional topography slopes gently westward toward the Sacramento River. The FOSET # 2 Property is located in the central and southeastern sections of the former McClellan AFB, and the surface elevation in this area is approximately 75 feet above mean sea level.

The vadose zone is the unsaturated soils between the ground surface and the water table. The vadose zone is approximately 95 to 110 feet thick, and the saturated (groundwater) zone is approximately 1,000 feet thick. The vadose zone and the shallow groundwater zone, to 450 feet bgs, are the zones most likely to be affected by contamination (CH2MHill, 2012).

Groundwater flow directions have varied over the past 80 years, but they have persisted in a south-to-southwesterly direction over the past decade. Deposits on the east side of the former McClellan AFB include more fine-grained sediments. In the eastern portions of the former McClellan AFB in Monitoring Zone A, relatively thinner saturated thicknesses and increased percentages of fine-grained sediments result in relatively lower transmissivity than in the western portions of the former McClellan AFB. Contaminant transport is inhibited, but not prevented, by lower permeability layers, both in the vadose and saturated zones. The relatively higher transmissivity in the western portions of the former McClellan AFB results in relatively greater potential for contaminant transport (CH2MHill, 2012).

2.5.2 Ecological Characteristics

AOC G-5 was identified as being located within the watershed of nearby wetlands. Surface runoff at AOC G-5 generally drains off the tarmac to the north, east, and west. Vernal pools 655 (0.013 acre), 656 (0.051 acre), and 657 (0.010 acre), along with seasonal wetland 654 (0.022 acre), are located north of the site and were considered to be potentially affected by site contaminants. Wetland swale 653 (0.021 acre) is located in the northwestern corner of the site just south of the hazardous waste storage area and was also considered to be potentially affected. Results of the Tier 2 Ecological Risk Assessment (ERA) indicate that contaminants in vernal pools/wetlands at AOC G-5 are not considered to present a substantive risk to plants and birds; however, there is risk to individual-level special-status benthic invertebrates from PAHs in seasonal wetland 654. Concentrations in wetland swale 653 and vernal pools 655 and 656 were considerably lower and were determined to not represent a substantial risk to benthic invertebrates. No evaluation or sampling was conducted for vernal pool 657; it was assumed that this vernal pool would be mitigated as part of site remediation because it is located immediately adjacent to an industrial use target volume area that was delineated prior to the vernal pool/wetland sampling.

SA 109 is the portion of Magpie Creek located within OU A and includes a constructed channel that traverses the southeastern portion of the former McClellan AFB. Magpie Creek receives surface water runoff through sheet flow directly into the creek and through a system of swales and subsurface drains. SA 109 is considered marginal habitat for aquatic or riparian species due to the industrialized nature of the area surrounding SA 109, the limited surface water flow, and the lack of wetland vegetation.

2.6 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

Much of the land surrounding the former McClellan AFB, particularly to the west, is zoned for low-density residential and agricultural use. Historical land use at the FOSET # 2 Action Sites included industrial and commercial usage. Based on the *McClellan Reuse Plan* (EDAW, 2000) and the McClellan Park Special Planning Area (Ordinance No. SZC-2002-0029) (County of Sacramento, 2002), all of the FOSET # 2 Action Sites are located within areas designated for industrial or industrial/commercial land use.

There are no current or future planned uses of groundwater at or in the vicinity of any of the FOSET # 2 Action Sites. Groundwater use is prohibited by restrictions described in the VOC Groundwater ROD (AFRPA, 2007). There are no current or future human uses (e.g., drinking water, irrigation, or recreational) of surface waters at or in the vicinity of any of the FOSET # 2 Action Sites. However, in accordance with the tributary rule of the Water Quality Control Plan (the Basin Plan) for the Sacramento River and San Joaquin River Basins, Magpie Creek would have a designated use as drinking water. There are seasonal drainage ditches and creeks, seasonal wetlands, and vernal pools in the vicinity of the FOSET # 2 Action Sites. The seasonal drainage features contribute to downstream receiving waters which empty into the Sacramento River. The potential beneficial uses of the receiving waters include drinking, irrigation, and recreational. The seasonal wetlands and vernal pools serve as habitat for various aquatic species.

2.7 SUMMARY OF SITE RISKS

The 43 FOSET # 2 Action Sites have varying degrees of potential risks to human health. Contamination at some of the sites also poses a potential threat to surface water and/or groundwater. The potential for migration to surface water and groundwater was determined by comparing detected concentrations of COCs to the screening levels for protection of surface water and groundwater. Screening levels for protection of surface water were applied to surface soils (0 to 1 foot bgs). Screening levels for protection of groundwater were applied from 0 to 15 feet bgs (with the exception of CS T-012, CS T-021, SA 045, and CS T-020, where soil will be cleaned up to 20–30 feet bgs).

2.7.1 Conceptual Site Model

A Conceptual Site Model (CSM) was used to develop an understanding of a site and to evaluate potential risks to human health and the environment. CSMs for the 43 FOSET #2 Action Sites examined VOC contamination in shallow soil and shallow soil gas, as well as non-VOCs in soil. The VOC and non-VOC components of this model were developed in accordance with EPA guidance and include known and suspected sources of contamination, types of contaminants and affected media, known and potential routes of migration, and known or potential human and ecological receptors. Information for the contaminant sources, transport pathways, and receptors are depicted schematically on Figure 2-1, which presents the conceptual site model for the shallow soil and vapor intrusion pathway and Figure 2-2, which presents the exposure pathway analysis, to aid in remedy selection. Site-specific CSM descriptions can be found in the Small Volume Sites RICS Addenda and FS (CH2MHill, 2011), the Follow-on Strategic Sites RICS and FS (CH2MHill, 2012), and the Building 252 RICS and FS (CH2MHill, 2010).

2.7.2 Human Health Risks

The baseline risk assessment estimates what risks a site would pose if no further action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline risk assessments for the FOSET # 2 Action Sites. As stated in the Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A) (EPA, 1989), baseline risk assessments are site-specific and therefore may vary in both detail and the extent to which qualitative and quantitative analyses are used. There are four elements required in a baseline risk assessment process: identification of COCs, exposure assessment, toxicity assessment, and risk characterization. Baseline human health risk assessments were conducted for each of the FOSET # 2 Action Sites using the process outlined in the following subsections.

2.7.2.1 Identification of Contaminants of Concern

Analytical data used to identify the COCs for the risk assessment include those from subsurface soil (0 to 10 feet bgs) and VOCs in soil gas (0 to 15 feet bgs) collected within the exposure areas of the various FOSET # 2 Action Sites. The subsurface soil depth intervals are used to represent future conditions if construction activities disturb subsurface soil and bring it to the surface to be mixed with surface soil.

All detected organic compounds in soil or soil gas were retained as COCs for the risk assessment, with one exception: VOCs in soil were not retained as COCs because VOCs are evaluated in soil gas. Some inorganic compounds are considered to be beneficial to human health or may be present only at naturally occurring levels. For this reason, an inorganic chemical was retained as a COC in the risk assessment for soil if:

- It was detected in a depth interval for which at least one exposure pathway was considered to be complete;
- It is not an essential human nutrient (EPA, 1989); or
- Detected concentrations exceeded recognized ambient levels at the former McClellan AFB.

COCs were identified separately by site. For each site, Table 2-2 summarizes the commercial/industrial and Attachment C summarizes the commercial/industrial and residential carcinogenic and non-carcinogenic human health risks. For each soil COC, the maximum detected concentration was used as the exposure point concentration (EPC). Soil gas data were evaluated on a sample-by-sample basis so EPCs are the detected concentrations of VOCs for an individual soil gas location. For the indoor air evaluation, it was assumed that a receptor's exposure will primarily be at one building. Therefore, rather than generating a single point estimate of exposure or risk across an exposure area (i.e., using 95 percent upper confidence limit EPCs for soil gas or a single point represented by the maximum detected concentrations), the VOCs detected in soil gas were evaluated on a sample-by-sample basis, in which each sample location represents an exposure point. This approach provides information on the spatial distribution of potential risk across the site, allowing the display of potential risk levels for specific portions of the FOSET # 2 Action Sites that are in the vicinity of buildings or in areas where buildings may be constructed in the future.

Chemical-specific concentrations for each site (i.e., maximum and minimum concentrations, frequency of detection) are presented for each site in the Small Volume Sites RICS Addenda and FS (CH2MHill, 2011), the Follow-on Strategic Sites RICS and FS (CH2MHill, 2012), and the Building 252 RICS and FS (CH2MHill, 2010).

2.7.2.2 Exposure Assessment

The exposure pathways that were included in the calculation of the human health risks are illustrated in Figure 2-1 and Figure 2-2 (CH2MHill, 2012). For non-VOCs in soil, the exposure pathways were soil ingestion, skin contact with soil, inhalation, and homegrown produce ingestion. For VOCs in shallow soil gas, the only exposure pathway was inhalation of VOCs emitted from soil into indoor air. The potentially exposed populations were hypothetical future residents, current and future outdoor occupational and construction workers, and future indoor occupational workers. Based on the current understanding of land use conditions at and near the site, an occupational worker scenario was considered and evaluated at the FOSET # 2 Action Sites. The commercial/industrial (occupational worker) scenario includes indoor occupational workers, outdoor occupational workers, and construction workers. Although residential land use is not planned for any of the FOSET # 2 Action Sites at this time, residential exposure scenarios

(adults and children; indoor and outdoor exposure) were evaluated to provide information on future risk management decisions.

Children and families that consume produce grown onsite are considered sensitive subpopulations. Potential exposures of these two groups were considered by including 6 years of childhood exposure and ingestion of homegrown produce in the development of the screening levels for the unrestricted use scenario.

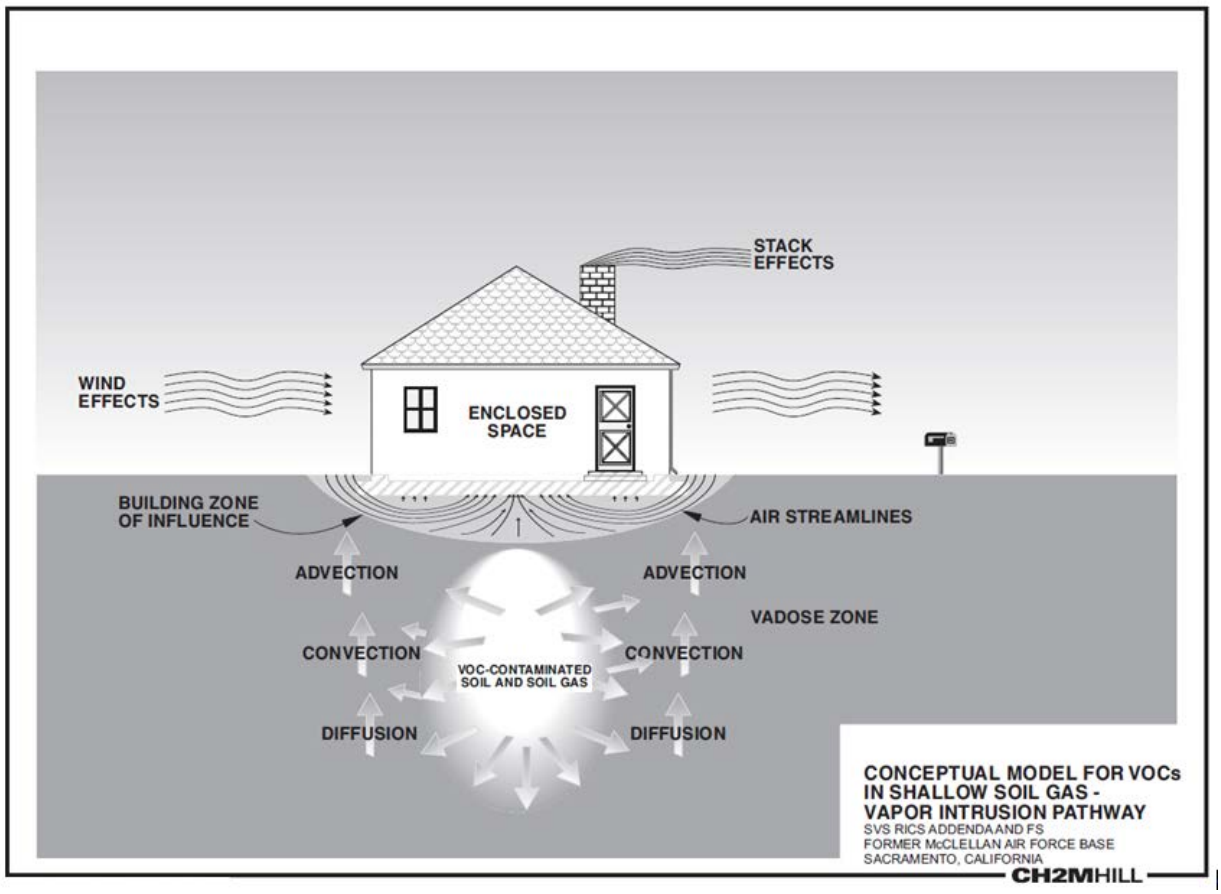

Figure 2-1 Conceptual Model for Vapor Intrusion Pathway

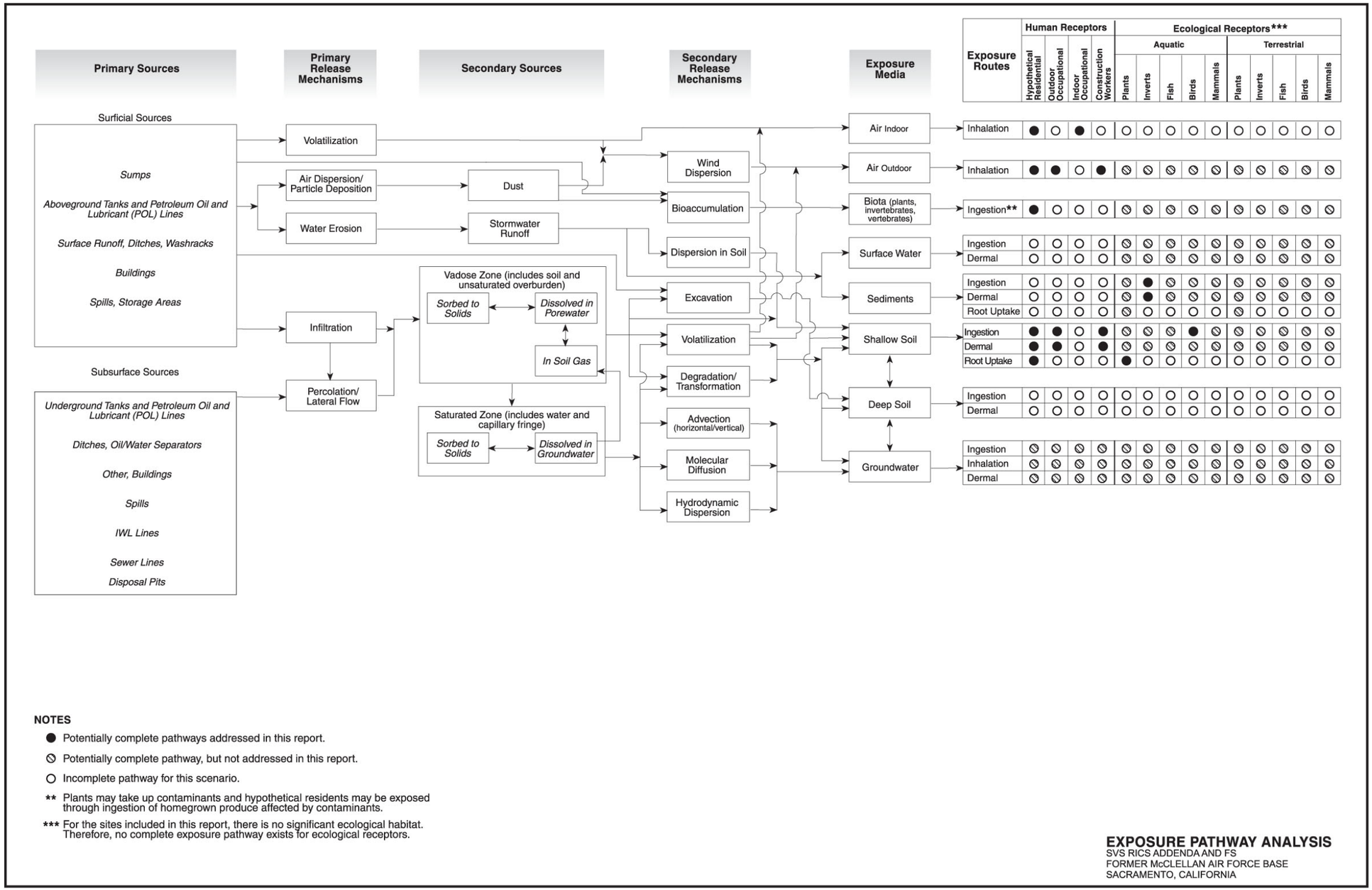

Figure 2-2 Exposure Pathway Analysis

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2.7.2.3 Toxicity Assessment

Chemicals detected at each site were evaluated as two groups based on their effects on human health: carcinogens (cancer causing) and non-carcinogens (may cause adverse health effects other than cancer). Chemicals classified as carcinogens may also exhibit non-carcinogenic health effects, thus these effects were also evaluated. For potential carcinogens, the quantitative risk to human health is expressed in terms of the probability of the chemical causing cancer over an estimated lifetime of 70 years. For non-cancer effects, the likelihood that a receptor will develop an adverse effect is evaluated as a predicted level by comparison to the highest level of exposure that is considered protective. For non-carcinogens, the potential impact to human health is expressed as a hazard quotient (HQ) for each exposure route (e.g. ingestion, dermal contact, and inhalation) and the hazard index (HI) is the sum of all the HQs for all chemicals to which adverse health effects are possible.

Additionally, exposure to lead was evaluated separately by comparison to risk-based levels estimated for occupational workers and residents.

2.7.2.4 Risk Characterization

For carcinogens, risks are generally expressed as the incremental probability of a population of individuals developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated from the following equation:

$$\text{Risk} = \text{CDI} \times \text{SF}$$

where:

risk = a unitless probability (e.g., 2×10^{-5}) of a population of individuals developing cancer

CDI = chronic daily intake averaged over 70 years (milligrams per kilograms per day [mg/kg-day])

SF = slope factor, expressed as $(\text{mg/kg-day})^{-1}$

These risks are probabilities that are expressed in scientific notation (e.g., 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} indicates that a population of individuals experiencing the reasonable maximum exposure estimate has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other causes such as smoking or exposure to too much sun. The chance of a population of individuals developing cancer from all other causes has been estimated to be as high as one in three. EPA's generally acceptable risk range for site-related exposures is 1×10^{-4} to 1×10^{-6}. Determination of what constitutes acceptable levels of residual risk within this range is made on a site-specific basis.

The potential for non-carcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., lifetime) with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that a population of individuals may be exposed to that is not expected to cause any deleterious effect. An HQ is the ratio of exposure to toxicity. An HQ less than 1 indicates that a receptor's dose of a single contaminant is less than the RfD, and that toxic non-carcinogenic effects from that chemical are unlikely. The HI is generated by adding the HQs for all COCs that affect the same target organ (e.g., liver) or that act through the same mechanism of action within a medium or across all media to which a given population of individuals may reasonably be exposed. An HI less than 1 indicates

that, based on the sum of all HQs from different contaminants and exposure routes, toxic non-carcinogenic effects from all contaminants are unlikely. An HI greater than 1 indicates that site-related exposures may present a risk to human health.

The HQ is calculated as follows:

$$\text{Non-cancer HQ} = \text{CDI}/\text{RfD}$$

where:

CDI = chronic daily intake

RfD = reference dose

CDI and RfD are expressed in the same units and represent the same exposure period (i.e., chronic [7 years or more], subchronic [2 weeks to 7 years], or short-term [less than 2 weeks]).

Uncertainties associated with the calculation of the risk-based screening levels could affect the risk estimates developed using the screening levels. These uncertainties include the following:

- **Use of the residential exposure assumptions** – The current and reasonably anticipated future land use for the FOSET # 2 Action Sites is industrial or industrial/commercial. Use of screening levels based on residential exposure assumptions might result in chemicals being identified as COCs that would not be COCs using the industrial exposure parameters. It will tend to overestimate potential risk by including the homegrown produce pathway, increasing exposure times, and including exposures to a child.

- **Homegrown produce pathway –** Plant root uptake of metals was only evaluated for the six metals included in EPA's Soil Screening Guidance (EPA, 1996) because the soil partition coefficients values available in literature for other metals were not as well defined as the Soil Screening Guidance values. Leaving plant root uptake out of the evaluation of the homegrown produce pathway for some metals will tend to underestimate risk via the homegrown produce pathway for those metals.

- **Route-to-route extrapolation for toxicity factors –** For some chemicals, cancer SFs or RfDs have only been established for one exposure route. In those cases, toxicity values were extrapolated across exposure routes. For instance, oral toxicity values were used to evaluate inhalation exposure in some cases. This simple extrapolation method allows a pathway for which no cancer SFs or RfDs have been defined to be evaluated. However, it also introduces uncertainties into the risk estimates because it does not account for differences in "port-of-entry" effects or pharmacokinetics (i.e., what the body does to the chemicals). The contribution from the exposure route for which the extrapolated toxicity factor was used might be overestimated or underestimated. The contribution from dermal exposure might be underestimated because no adjustment was made to the oral toxicity values used for the dermal route.

For lead, risks were evaluated by comparing soil concentrations with California Human Health Screening Levels (CHHSLs) by Cal-EPA (2009). The CHHSLs are based on a source-specific "benchmark change" of 1 microgram per deciliter (µg/dL) blood concentration of lead. The residential CHHSL value of 80 milligrams per kilogram (mg/kg) was adopted as the unrestricted screening level, and the industrial CHHSL of 320 mg/kg was adopted as the industrial screening level.

Results of the quantitative risk assessment conducted for each site are presented in Table 2-2 for the commercial/industrial occupational worker and in Attachment C for both the commercial/industrial occupational worker and future resident. The tables present cancer risks and non-cancer hazards for each site using color codes to indicate the level of concern for consideration of remedial action. Green indicates a risk below the risk management range, yellow within the risk management range, and red above the risk management range. Table 2-2 also includes risk drivers (i.e., COCs). The maximum estimated risk to a commercial/industrial (occupational) worker for combined exposure to soil and SSG is provided in Attachment D for each Action Site. The maximum estimated risk was determined by adding the commercial/industrial risk value for soil to the highest commercial/industrial risk value for soil vapor. This value was included to represent the total risk from all soil exposure pathways and to support the rationale discussion for the selected remedies.

Individual human health risk assessments (HHRAs) for the FOSET # 2 Action Sites were conducted for exposure to chemicals in soil only; groundwater characterization was not considered part of the investigation.

In general, calculated cumulative cancer risks greater than 1×10^{-4} and HIs greater than 1 require consideration of cleanup alternatives. Cancer risks between 1×10^{-4} and 1×10^{-6} (between 1 in ten-thousand and 1 in one-million) fall within EPA's risk management range. Determination of what constitutes acceptable levels of residual risks within this range is decided on a site-specific basis, considering the degree of conservatism and inherent uncertainty associated with the risk assessment. Cumulative incremental lifetime cancer risk related to site contamination below 1×10^{-6} is considered a *de minimis* level and typically does not warrant active risk/exposure mitigation.

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Table 2-2 Summary of Cancer Risks and Non-carcinogenic Hazards for the FOSET # 2 Action Sites in a Restricted Use Scenario

Site	Commercial/Industrial Risk				COC Risk Drivers		Selected Remedial Alternative(s)
	Soil		Shallow Soil Gas				
	Carcinogenic Risk	Non-carcinogenic HI	Carcinogenic Risk	Non-carcinogenic HI	Soil	Shallow Soil Gas	
AOC G-3	8E-05	< 1	8E-06	< 1	Benzo(a)pyrene	Naphthalene	VOC2 and Non-VOC4a
AOC G-4	1E-04	< 1	8E-06	< 1	Benzo(a)pyrene Benzo(a)anthracene Benzo(b)fluoranthene Indeno(1,2,3-c,d)pyrene	Naphthalene	VOC3 and Non-VOC4a
AOC G-5	2E-04	< 1	2E-06	< 1	Benzo(a)pyrene Aroclor-1260	PCE TCE	VOC2 and Non-VOC4a
CS 038	1E-05	< 1	5E-04	9	Naphthalene Benzo(a)pyrene	PCE 1,2,4-TMB 1,3,5-TMB	VOC3 and Non-VOC4a
CS 040/ PRL S-006/ PRL S-019	1E-04	< 1	2E-05	< 1	Aroclor-1260 Benzo(a)pyrene Dibenzo(a,h)anthracene dieldrin	1,1-DCA cis-1,2-DCE PCE	VOC2 and Non-VOC4a
CS B-005	3E-05	4	4E-07	< 1	Copper Manganese Arsenic	Benzene	VOC2 and Non-VOC4a
CS S-007	2E-04	7	3E-05	< 1	Naphthalene 1,3-DCB	TCE cis-1,2-DCE	VOC3 and Non-VOC4a
CS S-024	4E-06	< 1	3E-06	< 1	Aroclor-1260	PCE	VOC2 and Non-VOC4a
CS S-026	7E-06	< 1	1E-05	4	Naphthalene	1,2,4-TMB PCE	VOC3 and Non-VOC4a
CS T-012/ CS T-021	1E-06	< 1	< 1E-06	< 1	Benzo(a)pyrene	None	Non-VOC4a
CS T-016	9E-06	< 1	2E-06	< 1	1-Methylnaphthalene	Benzene Ethylbenzene	VOC2 and Non-VOC4a
CS T-017	1E-05	< 1	7E-07	< 1	Benzo(a)pyrene Benzo(a)anthracene	Carbon Tetrachloride Chloroform TCE PCE	Non-VOC4a
CS T-020	1E-08	< 1	2E-07	< 1	None	Benzene	VOC3 and Non-VOC4a

Site	Commercial/Industrial Risk				COC Risk Drivers		Selected Remedial Alternative(s)
	Soil		Shallow Soil Gas				
	Carcinogenic Risk	Non-carcinogenic HI	Carcinogenic Risk	Non-carcinogenic HI	Soil	Shallow Soil Gas	
CS T-030/ PRL S-018	3E-06	13	< 1E-06	< 1	Mercury PAHs	None	Non-VOC4a
CS T-036	8E-06	< 1	3E-08	< 1	Dieldrin	None	Non-VOC4a
CS T-047	2E-06	< 1	2E-05	< 1	2-Methylnaphthalene Naphthalene	PCE cis-1,2-DCE 1,1-DCA	VOC2 and Non-VOC4a
CS T-057/ SA 080/ SA 107	4E-05	< 1	9E-05	< 1	Dioxins/Furans	TCE cis-1,2-DCE	VOC3 and Non-VOC4a
PRL S-001	4E-06	< 1	3E-06	< 1	Cadmium	PCE Carbon Tetrachloride Chloroform	VOC2 and Non-VOC4a
PRL S-002	1E-05	< 1	5E-07	< 1	Aroclor-1260	Naphthalene Benzene	Non-VOC4a
PRL S-017	4E-06	< 1	2E-06	< 1	None	TCE Carbon Tetrachloride	VOC2 and Non-VOC4a
PRL S-025	1E-06	< 1	3E-07	< 1	Aroclor-1254 Aroclor-1260	Benzene	Non-VOC4a
PRL S-036	6E-07	< 1	2E-06	< 1	Aroclor-1260	Carbon Tetrachloride	Non-VOC4b
PRL S-043	2E-05	< 1	2E-06	< 1	Benzo(a)pyrene	PCE	VOC2 and Non-VOC4b
PRL S-044	7E-05	< 1	1E-06	< 1	Benzo(a)pyrene Thallium	TCE	VOC2 and Non-VOC4a
PRL S-045	4E-06	< 1	9E-07	< 1	Benzo(a)pyrene	Benzene	VOC2 and Non-VOC4b
PRL T-032	2E-05	< 1	4E-06	4	Naphthalene	1,2,4-TMB 1,3,5-TMB	VOC3 and Non-VOC4a
SA 004	5E-05	3	2E-05	< 1	Aroclor-1260	PCE	VOC2 and Non-VOC4b
SA 045	3E-06	< 1	5E-07	< 1	1-Methylnaphthalene Naphthalene	Chloroform Benzene	Non-VOC4a
SA 049	8E-06	< 1	< 1E-06	< 1	Benzo(a)pyrene	None	Non-VOC4a
SA 055	1E-07	< 1	2E-06	< 1	Aroclor-1260	PCE	Non-VOC4b
SA 060	3E-08	< 1	3E-07	< 1	None	TCE	Non-VOC4a
SA 063	2E-04	12	1E-07	< 1	Aroclor-1260	Chloroform	Non-VOC4a

Site	Commercial/Industrial Risk				COC Risk Drivers		Selected Remedial Alternative(s)
	Soil		Shallow Soil Gas				
	Carcinogenic Risk	Non-carcinogenic HI	Carcinogenic Risk	Non-carcinogenic HI	Soil	Shallow Soil Gas	
SA 066	6E-11	< 1	1E-03	5	None	Chloroform Carbon Tetrachloride 1,2,4-TMB 1,3,5-TMB	VOC3 and Non-VOC4a
SA 096	3E-06	< 1	3E-07	< 1	None	Naphthalene	Non-VOC4a
SA 097	4E-06	< 1	1E-04	< 1	4-Chloroaniline	TCE cis-1,2-DCE	VOC3 and Non-VOC4a
SA 100	2E-05	< 1	8E-06	< 1	Benzo(a)pyrene Dioxins/Furans	Carbon Tetrachloride Chloroform	VOC2 and Non-VOC4a
SA 109 (F2)	9E-06	< 1	< 1E-06	< 1	Cadmium Aroclor-1254 Aroclor-1260	None	Non-VOC4b

Notes: Green indicates a risk below the risk management range, yellow indicates risk within the risk management range, and red indicates risk above the risk management range.
*****Excludes risk estimates from metal concentrations that are not considered to be representative of site contamination (e.g. within the range of natural background variation or detected with an unreliable analytical method).

AOC area of concern
COC contaminant of concern
CS confirmed site
DCB dichlorobenzene
DCA dichloroethane
DCE dichloroethene
F2 the portion of the site within FOSET # 2
HI Hazard Index
PAH polycyclic aromatic hydrocarbon
PCE Tetrachloroethene
PRL potential release location
SA study area
TCE trichloroethene
TMB trimethylbenzene
VOC volatile organic compound

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2.7.3 Ecological Risks

In cooperation with regulatory/resource agencies, the Air Force evaluated all IRP sites for their potential to affect downgradient habitats, including creeks, wetlands, and vernal pools. The basewide creeks program evaluates potential impacts to creeks, and any IRP site that was identified as having potential to affect downgradient vernal pools was retained for evaluation in the Basewide Vernal Pool Scoping Level/Tier 1 ERA (Parsons, 2005). Based on the results of the Scoping Level/Tier 1 ERA, one of the Action Sites (AOC G-5) was retained for further evaluation in a Tier 2 ERA.

Results of the Tier 2 ERA indicate that because no analytes had HQs above 1 for plants and high toxicity reference value-based HQs for detected analytes were all less than 1 for birds; contaminants in vernal pools/wetlands at AOC G-5 are not considered to present a substantive risk to plants and birds. However, PAH concentrations in seasonal wetland 654 may pose a risk to special-status vernal pool invertebrates. Concentrations in wetland swale 653 and vernal pools 655 and 656 were considerably lower and were determined to not represent a substantive risk to benthic invertebrates. No evaluation was conducted for vernal pool 657 because it was assumed that this vernal pool would be mitigated as part of site remediation because it is located immediately adjacent to an industrial use target volume area.

As such, the only FOSET # 2 Action Site that was identified as potentially posing risk to ecological receptors in vernal pools onsite or nearby was AOC G-5, where VOC2 (ICs – Restricted Land Use) and Non-VOC4a (Excavation and Disposal – Restricted Land Use) are the selected response actions. Protection of ecological receptors will be achieved by eliminating the potential risks to benthic invertebrates from contaminants in soil and sediment through excavation and disposal of soil and sediment within seasonal wetland 654 at AOC G-5 at concentrations exceeding restricted use cleanup levels. Because the affected wetland is located in an area planned for future industrial use, the wetland will not be restored. Mitigation (purchase of credits in a habitat mitigation bank or payment of mitigation fees as compensation) will be required for the impacted wetland (CH2MHill, 2012).

2.7.4 Summary of Site Risks

The basis for action at the 43 FOSET # 2 Action Sites is that one or more of the following is true at each site: (1) cumulative excess carcinogenic risk to an individual exceeds 1×10^{-4}, (2) the non-carcinogenic HI is greater than 1, (3) chemical-specific standards for lead (based on blood lead levels) are exceeded in soil, (4) soil contamination poses significant risks to surface water, (5) soil contamination poses significant risks to groundwater, or (6) there is some remaining uncertainty regarding the characterization of site contaminants or risks. Ecological habitat is present at several of the FOSET # 2 Action Sites, so exposure of ecological receptors is also part of the basis of decision. Only one site (AOC G-5) was determined to potentially pose a risk to ecological receptors. The specific basis of action for each site is described in Table 2-1 and Attachment D. Based on the data presented in Table 2-1and Attachment D, the response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

2.8 REMEDIAL ACTION OBJECTIVES

EPA, in conjunction with the Air Force, has developed remedial action objectives (RAOs) to describe how the remedy is expected to address site risks. These RAOs are based on current and future land uses and address exposure risks by removing contamination and isolating potential receptors from remaining contamination. The RAOs are as follows:

- For protection of human health, prevent inhalation, ingestion, direct contact, and external exposure to shallow soil gas and soil within the upper 15 feet bgs (with certain exceptions, as

specified in Section 2.2.4) posing excess cancer risk greater than the CERCLA risk range (1×10^{-6} to 1×10^{-4}) or an HI greater than 1.

- Protect surface water and groundwater quality and uses from contaminants in soil and sediment.

- Protect ecological receptors.

2.8.1 Basis and Rationale for Remedial Action Objectives

The RAOs were selected in consideration of the current land use and to support the anticipated future land use. Current and anticipated future land use at the FOSET # 2 Action Sites is industrial or industrial/commercial. Residential use and use by sensitive receptors (e.g., day care centers, public or private schools for persons under 18 years of age, hospitals, etc.) will be prohibited. Surface water and groundwater quality, as well as ecological receptors, will be protected.

2.8.2 How the Remedial Action Objectives Address Risks

The RAOs will address unacceptable risks identified in the risk assessment by preventing exposure to ensure that, after implementation of the remedies, the remaining risks will be below or within the acceptable risk management range for the anticipated future land use. Because some of the selected remedies involve leaving contamination in place that is acceptable for industrial use, ICs restricting residential use will be used to ensure that land use does not change, to prevent residential exposure.

2.8.3 Basis of Cleanup Levels

For human health, cleanup levels for all contaminants were calculated using inputs specific to the former McClellan AFB (some of the exposure parameters used in the risk calculations, such as the homegrown produce pathway, have been derived specifically for the former McClellan AFB) and represent the lesser of the concentration equivalent to a 1×10^{-6} carcinogenic risk or the concentration equivalent to an HI of 1. For soil, risk-based cleanup levels supportive of unrestricted use were developed for most contaminants based on exposure via ingestion of soil, ingestion of homegrown produce, inhalation, and dermal contact. Risk-based cleanup levels supportive of industrial use were developed based on exposure via ingestion of soil, inhalation, and dermal contact. The cleanup levels for shallow soil gas are based on the vapor inhalation pathway. Following attainment of the cleanup levels for the protection of human health, residual risk associated with chemical constituents on an individual basis would be at or less than a carcinogenic risk of 1×10^{-6} or a non-carcinogenic HI of 1 for industrial exposure.

Cleanup levels for lead in the soil from 1 to 15 feet bgs are based on DTSC's residential CHHSL of 80 mg/kg as the unrestricted use level, and the industrial CHHSL of 320 mg/kg as the industrial level. The cleanup level for lead in surface soil (0 to 1 foot horizon) for protection of surface water is 140 mg/kg, which represents a cleanup to the anthropogenic background levels for lead at the former McClellan AFB (i.e., levels resulting from normal human activity). The cleanup levels for cadmium and cobalt in surface soil (0 to 1 foot bgs) and for cobalt in subsurface soil (1 to 15 feet bgs) are based on the background concentrations of these metals.

Cleanup levels for protection of human health were not developed for TPH-D and TPH-G. Instead, cleanup levels for the protection of surface water quality and groundwater quality were selected as the cleanup levels for TPH-D and TPH-G.

Cleanup levels for protection of groundwater from metals, SVOCs, and TPH in soil (0 to 30 feet bgs) were derived separately. Cleanup levels for metals and TPH-D were calculated using the Designated

Level Methodology (DLM) (Central Valley Water Board, 1989). The basis used for the development of cleanup levels for metals and TPH-D is either the maximum contaminant levels (MCLs) or risk-based Water Quality Limits (WQLs). For SVOCs and TPH-G, cleanup levels for protection of groundwater were developed using vadose zone and groundwater mixing-cell models. The basis for the evaluation is either MCLs or other risk-based WQLs. The MCLs or WQLs for each contaminant were identified in consultation with the Central Valley Water Board.

Cleanup levels for the FOSET # 2 Action Sites are presented in Table 2-3 and levels for protection of surface water and groundwater quality for use in evaluating the need for ICs/ECs are presented in Table 2-4. The levels for protection of surface water and groundwater quality apply to soil at the Action Sites and specify the concentrations at which ICs and/or ECs, such as maintenance of existing surface covers, are required. SSG IC compliance levels are presented in Table 2-5. The SSG IC compliance levels apply to soil vapor at the Action Sites and specify the concentrations at which ECs, such as vapor controls, are required. When concentrations decrease below the SSG IC compliance levels, ECs may no longer be necessary. EPA, in consultation with DTSC and the Central Valley Water Board, set these cleanup levels and other action levels (IC compliance levels and water quality protection levels) to protect human health and water quality. While the FOSET # 2 Action Sites ROD does not address cleanup of groundwater, it is expected that these action levels will also protect groundwater under the FOSET # 2 Property.

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Table 2-3 Cleanup Levels – FOSET # 2 Action Sites

COC	Unrestricted Use Cleanup Levels (mg/kg)				Industrial Use Cleanup Levels (mg/kg)			
	0–1 foot bgs	Basis for Cleanup	1–15 feet bgs	Basis for Cleanup	0–1 foot bgs	Basis for Cleanup	1–15 feet bgs	Basis for Cleanup
Inorganics								
Antimony	20	Protection of human health	20	Protection of human health	190	Protection of surface water	370	Protection of human health
Arsenic	12	Protection of human health	12	Protection of human health	12	Protection of human health	12	Protection of human health
Cadmium	4.1	Surface soil background	6.2	Protection of human health	4.1	Surface soil background	96	Protection of groundwater
Cobalt	16	Surface soil background	18	Subsurface soil background	270	Protection of human health	270	Protection of human health
Copper	130	Protection of surface water	1,400	Protection of human health	130	Protection of surface water	37,000	Protection of human health
Lead	140	Surface soil background	80	Protection of human health	140	Surface soil background	320	Protection of human health
Manganese	830	Protection of human health	830	Protection of human health	1,600	Protection of surface water	22,000	Protection of human health
Mercury	1.6	Protection of surface water	3.5	Protection of human health	1.6	Protection of surface water	120	Protection of groundwater
Zinc	1,700	Protection of surface water	3,100	Protection of human health	1,700	Protection of surface water	140,000	Protection of groundwater
SVOCs								
1-Methylnaphthalene	0.73	Protection of human health	0.73	Protection of human health	89	Protection of human health	89	Protection of human health
2-Methylnaphthalene	16	Protection of human health	16	Protection of human health	170	Protection of human health	170	Protection of human health
1,2-Dichlorobenzene	190	Protection of human health	190	Protection of human health	770	Protection of surface water	3,900	Protection of human health, groundwater
1,3-Dichlorobenzene	76	Protection of human health	76	Protection of human health	1,900	Protection of human health	1,900	Protection of human health, groundwater
1,4-Dichlorobenzene	1.1	Protection of human health	1.1	Protection of human health	4.5	Protection of human health	4.5	Protection of human health
4-Chloroaniline	1.3	Protection of human health	1.3	Protection of human health	900	Protection of surface water	1,900	Protection of human health, groundwater
Benzo(a)anthracene	0.088	Protection of human health	0.088	Protection of human health	0.14	Protection of surface water	0.88	Protection of human health
Benzo(a)pyrene	0.018	Protection of human health	0.018	Protection of human health	0.14	Protection of surface water	0.14	Protection of human health
Benzo(b)fluoranthene	0.11	Protection of human health	0.11	Protection of human health	0.14	Protection of surface water	0.88	Protection of human health

COC	Unrestricted Use Cleanup Levels (mg/kg)				Industrial Use Cleanup Levels (mg/kg)			
	0–1 foot bgs	Basis for Cleanup	1–15 feet bgs	Basis for Cleanup	0–1 foot bgs	Basis for Cleanup	1–15 feet bgs	Basis for Cleanup
Benzo(k)fluoranthene	0.11	Protection of human health	0.11	Protection of human health	0.14	Protection of surface water	0.88	Protection of human health
Chlordane (alpha, gamma)	0.018	Protection of surface water	0.43	Protection of human health	0.018	Protection of surface water	5.2	Protection of human health, groundwater
Chrysene	0.14	Protection of surface water	0.88	Protection of human health	0.14	Protection of surface water	8.7	Protection of human health
Dibenzo(a,h)anthracene	0.038	Protection of human health	0.038	Protection of human health	0.14	Protection of surface water	0.26	Protection of human health
DDD	0.027	Protection of surface water	0.50	Protection of human health	0.027	Protection of surface water	7.6	Protection of human health, groundwater
DDE	0.019	Protection of surface water	0.49	Protection of human health	0.019	Protection of surface water	5.4	Protection of human health, groundwater
DDT	0.019	Protection of surface water	0.47	Protection of human health	0.019	Protection of surface water	5.4	Protection of human health, groundwater
Dieldrin	0.0045	Protection of surface water	0.0058	Protection of human health	0.0045	Protection of surface water	0.11	Protection of human health
Dioxins/Furans	4.2E-07	Protection of surface water	1.3E-06	Protection of human health	4.2E-07	Protection of surface water	1.6E-05	Protection of human health
Indeno(1,2,3-c,d)pyrene	0.12	Protection of human health	0.12	Protection of human health	0.14	Protection of surface water	0.88	Protection of human health
Naphthalene	2.4	Protection of human health	2.4	Protection of human health	5.1	Protection of human health	5.1	Protection of human health
PCBs (Aroclor-1254 and Aroclor-1260)	0.063	Protection of human health	0.063	Protection of human health	0.063	Protection of human health	0.53	Protection of human health
Total Petroleum Hydrocarbons	**0–1 foot bgs**	**Basis for Cleanup**	**1–30 feet bgs**	**Basis for Cleanup**	**0–1 foot bgs**	**Basis for Cleanup**	**1–30 feet bgs**	**Basis for Cleanup**
TPH-D	3,200	Protection of surface water	3,900	Protection of groundwater	3,200	Protection of surface water	3,900	Protection of groundwater
TPH-G	160	Protection of surface water	220	Protection of groundwater	160	Protection of surface water	220	Protection of groundwater

Notes: Values for protection of human health, used as the basis for cleanup for non-VOCs and VOCs, are equivalent to the lesser of the carcinogenic risk of 1E-06 or a Hazard Quotient (HQ) 1 for each contaminant for exposure to soil through direct contact, inhalation, and ingestion for the industrial use scenario.

COC contaminant of concern
bgs below ground surface
DDD Dichlorodiphenyldichloroethane
DDE Dichlorodiphenyldichloroethylene
DDT Dichlorodiphenyltrichloroethane
mg/kg milligrams per kilogram
PCBs polychlorinated biphenyls
SVOC semi-volatile organic compound
TPH-D Total petroleum hydrocarbons as diesel
TPH-G Total petroleum hydrocarbons as gasoline

Table 2-4 Levels for Protection of Surface Water and Groundwater Quality

	Protection of Surface Water Levels	Protection of Groundwater Levels
Contaminant[b]	**0 to 1 foot bgs**	**0 to 30 feet bgs**
Inorganics (mg/kg)		
Aluminum	15,000[d]	84,000
Antimony[c]	190	600
Arsenic[f]	12[d]	12[d]
Cadmium	4.1[d]	96
Cobalt	1,600	47,000
Copper	130	250,000
Cyanide	170	--
Lead	140[d]	4,300
Manganese[c]	1,600	28,000
Mercury	1.6	120
Zinc	1,700	140,000
SVOCs (mg/kg)		
1,2-Dichlorobenzene[c]	770	3,900
1,3-Dichlorobenzene[c]	13,000	1,900
1,4-Dichlorobenzene	160	14
1-Methylnaphthalene	--	89
2-Methylnaphthalene[c]	--	170
2,3,7,8-TCDD (dioxins/furans, total TEQ)	0.00000042	0.0027
4-Chloroaniline[c]	900	--
Benzo(a)anthracene	0.14	17
Benzo(a)pyrene	0.14	17
Benzo(b)fluoranthene	0.14	22
Benzo(k)fluoranthene	0.14	9.8
Chlordane, alpha[c]	0.018	5.2
Chlordane, gamma[c]	0.018	5.2
Chrysene	0.14	18
DDD[c]	0.027	7.6
DDE[c]	0.019	5.4
DDT[c]	0.019	5.4
Dibenzo(a,h)anthracene	0.14	8.3
Dieldrin	0.0045	0.11
Indeno(1,2,3-cd)pyrene	0.14	11
Naphthalene	670	1,100
PCBs (Aroclor-1254, Aroclor-1260)[e]	0.17	540
TPH (mg/kg)		
TPH-D	3,200	3,900
TPH-G	160	220

Notes: a) The values contained in this table are for use in determining whether ICs and/or ECs are necessary for the protection of groundwater and surface water quality.
b) The source of the levels for protection of groundwater and surface water is Table 80 of the FOSS ROD, unless otherwise noted.

c) The source of the levels for protection of groundwater and surface water is Table C1-19 of the FOSS RICS because the contaminant was not included in Table 80 of the FOSS ROD.
d) The background value is higher than the levels for protection of groundwater and surface water, so the background value has been included in place of the values specified in Table 80 of the FOSS ROD or Table C1-19 of the FOSS RICS.
e) The screening level for protection of surface water for total PCBs is based on 25% of the high TRV for benthic invertebrates.
f) The cleanup levels for arsenic are based on the recently revised background threshold value and risk management action level for arsenic (95% UTL with 99% coverage).

--	no protection level was developed
bgs	below ground surface
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
EC	engineered control
FOSS	Follow-on Strategic Sites
IC	institutional control
mg/kg	milligrams per kilogram
PCBs	polychlorinated biphenyls
RICS	Remedial Investigation Characterization Summary
ROD	Record of Decision
SVOCs	semi-volatile organic compounds
TCDD	tetrachlorodibenzo-p-dioxin
TPH	total petroleum hydrocarbons
TPH-D	total petroleum hydrocarbons as diesel
TPH-G	total petroleum hydrocarbons as diesel
TRV	toxicity reference value
UTL	upper tolerance level

Table 2-5 Shallow Soil Gas Institutional Control Compliance Levels

COC	IC Compliance Level	Depth	Basis for Cleanup
Volatile Organic Compounds (VOCs) (ppbv)			
1,1-DCA	620	0 to 15 feet	Protection of human health
1,2-DCB	48,000	0 to 15 feet	Protection of human health
1,2-DCA	39	0 to 15 feet	Protection of human health
1,2,4-TMB	2,100	0 to 15 feet	Protection of human health
1,3-DCB	25,000	0 to 15 feet	Protection of human health
1,3,5-TMB	1,800	0 to 15 feet	Protection of human health
1,4-DCB	58	0 to 15 feet	Protection of human health
2-Methylnaphthalene	760	0 to 15 feet	Protection of human health
Benzene	160	0 to 15 feet	Protection of human health
Carbon tetrachloride	44	0 to 15 feet	Protection of human health
Chloroform	36	0 to 15 feet	Protection of human health
cis-1,2-DCE	13,000	0 to 15 feet	Protection of human health
Ethylbenzene	370	0 to 15 feet	Protection of human health
Hexachlorobutadiene	17	0 to 15 feet	Protection of human health
Hexane	290,000	0 to 15 feet	Protection of human health
Methylene chloride	2,500	0 to 15 feet	Protection of human health
m,p-xylene	32,000	0 to 15 feet	Protection of human health
Naphthalene	23	0 to 15 feet	Protection of human health
PCE[a]	2,300	0 to 15 feet	Protection of human health
TCE	190	0 to 15 feet	Protection of human health
Vinyl chloride[b]	180	0 to 15 feet	Protection of human health

Notes: Values for protection of human health, used as the basis for cleanup for VOCs, are equivalent to the lesser of the carcinogenic risk of 1E-06 or an HQ of 1 for each contaminant for exposure to soil gas through indoor air inhalation for the industrial use scenario.

a) The PCE SSG IC compliance level (2,300 ppbv industrial use) is not generally considered protective by the DTSC. PCE post-remedy residual contamination concentrations falling between 98 to 2,300 ppbv for industrial use may not be suitable, according to the DTSC, for unrestricted/industrial reuse without additional institutional controls.

b) The vinyl chloride SSG IC compliance level (180 ppbv industrial use) is not generally considered protective by the DTSC. Vinyl chloride post-remedy residual contamination concentrations falling between 20 and 180 ppbv for industrial use may not be suitable, according to the DTSC, for unrestricted/industrial reuse without additional institutional controls.

COC contaminant of concern
DCA dichloroethane
DCB dichlorobenzene

DCE	dichloroethene
IC	institutional control
PCE	tetrachloroethene
ppbv	parts per billion by volume
TCE	trichloroethene
TMB	trimethylbenzene
VOC	volatile organic compound

2.9 DESCRIPTION OF ALTERNATIVES

Representative process options were screened and assembled into nine remedial alternatives that address a broad range of site conditions and contaminant types. Under some alternatives, contaminants will be removed to reduce the risk such that the sites are available for unrestricted land use. Under alternatives requiring ECs or ICs, sites will be available for limited use (referred to as restricted or industrial land use). Because the types (e.g., VOCs versus non-VOCs) and mix of contamination vary by site, not all of the alternatives were evaluated for every site. The nine evaluated alternatives are as follows:

- **Alternative 1 – No Further Action.** CERCLA and the NCP require the evaluation of a No Further Action alternative to establish a basis for comparison with other alternatives. No remedial activities for VOCs or Non-VOCs are implemented under this alternative. No cost is associated with this alternative. The No Further Action alternative does not reduce risk to human health or the environment.

- **Alternative VOC2 – Institutional Controls to Prohibit Residential Use (Restricted Land Use)**. ICs would be used under this alternative to eliminate or limit exposure pathways to humans where site contamination levels in SSGs would not allow for unrestricted land use. This alternative would restrict land use such that the property may not be used for sensitive uses such as homes, day care centers, health care centers, or public or private schools for persons under 18 years of age within the contaminated portion of the property.

- **Alternative VOC3 – Institutional Controls to Mitigate Shallow Soil Gas Contamination (Restricted Land Use)**. Under this alternative, land use activity restrictions would be used to mitigate the potential for VOCs in SSG to migrate into buildings and impact occupants via the vapor inhalation pathway. This alternative would restrict land use such that the property may not be used for sensitive uses as described for Alternative VOC2. In addition, the selected restrictions under Alternative VOC3 would require the installation of ECs (such as vapor barriers, gas collection systems, and/or ventilation systems) in any future buildings or during significant remodeling of existing buildings (e.g., remodeling that requires replacing major portions of the foundation or floor), unless sampling indicates that the IC compliance levels in Table 2-5 are not exceeded.

- **Alternative VOC4 – Soil Vapor Extraction and Institutional Controls to Restrict Land Use**. SVE is a process that applies a vacuum to subsurface soil (via extraction wells) to extract contaminated vapors from the soil and flush fresh air through the contaminated soil. As necessary, the extracted vapors are treated to reduce emissions to the air to acceptable levels. Under Alternative VOC4, existing SVE systems (operating under the former McClellan AFB SVE Program) would continue to operate at sites containing VOCs in SSG to mitigate the vapor inhalation pathway. If necessary, additional shallow extraction or monitoring wells would be installed to enhance the existing SVE systems, as the existing SVE systems are operated for the sole protection of groundwater and are not intended to remediate SSG contamination. In addition, this alternative would use ICs to restrict land use such that the property may not be used

for sensitive uses as described for Alternative VOC2 and would require the installation of ECs until the IC compliance levels are reached as described for Alternative VOC3.

- **Alternative Non-VOC2 – Institutional Controls to Restrict Land Use, Engineered Controls, and Monitoring**. Under this alternative, ICs, ECs, and/or monitoring would be used to eliminate or limit exposure pathways for non-VOCs to human receptors and the environment. The specific type of controls and/or monitoring required for a particular site would depend on the specific characteristics of each site such as the type of contaminants, how people might come in contact with the contaminants, the risk associated with the contaminants, and whether the contaminants could migrate offsite. Monitoring would be implemented in conjunction with, and in support of, other remedies such as ICs and ECs. The monitoring would be used to show that the remedy protects human health and the environment.

- **Alternative Non-VOC3 – Bioventing and Institutional Controls to Restrict Land Use**. Bioventing is typically used for sites with fuel-related contamination. This alternative involves pumping oxygen to contaminated soils through the extraction and/or injection of air. As necessary, the extracted vapors are treated to reduce emissions to the air to acceptable levels. The increased oxygen within the subsurface supports naturally-occurring microorganisms within the soil to biodegrade the contamination. Because the contamination would be treated in place, ICs and monitoring similar to those described for Alternative Non-VOC2 would be required under Alternative Non-VOC3. Once treatment was completed, the ICs and monitoring requirements could be eliminated if unrestricted land use cleanup levels were achieved. Based on previous bioventing systems that have been installed at McClellan Park, it is estimated that it would take several years for bioventing to achieve RAOs.

- **Alternative Non-VOC4a – Excavation and Disposal (Restricted Land Use)**. Under this alternative, soil that is contaminated at levels above industrial use cleanup levels would be excavated and transported off-site for disposal at an appropriate facility. Because some residual contamination would remain at the site, ICs and ECs would be used to eliminate or limit exposure pathways for non-VOCs to human receptors and the environment. The site would be restricted to industrial or commercial use. Sensitive uses such as residential use, public or private schools for persons under 18 years of age, and/or day care centers would be prohibited. For sites where residual contamination could impact surface water, ECs (such as maintaining a surface cover or sediment collection and monitoring) would be required to protect surface water. Alternatively, if the existing cover is removed and there is a potential impact to surface water quality, sampling must be done to determine if a surface cover or sediment trap and sediment monitoring are required. Monitoring would be implemented in conjunction with, and in support of, other remedies such as ICs and ECs. Based on previous excavation activities at the former McClellan AFB, it is estimated that most excavations could be planned and executed within 6 months to 1 year.

- **Alternative Non-VOC4b – Excavation and Disposal (Unrestricted Land Use)**. Under this alternative, soil that is contaminated at levels above unrestricted use cleanup levels would be excavated and transported for disposal at an appropriate facility. Because all contamination above unrestricted use cleanup levels would physically be removed from the site, no ICs or long-term monitoring would be required. Alternative Non-VOC4b would facilitate unrestricted use of the site, including residential use, public or private schools for persons under 18 years of age, and/or day care centers. Based on previous excavation activities at the former McClellan AFB, it is estimated that most excavations could be planned and executed within 6 months to 1 year.

- **Alternative Non-VOC5 – Composite Cap (Restricted Land Use).** Under this alternative, contaminated soil and debris would be covered with an engineered cap to eliminate human and ecological receptor exposure pathways, reduce infiltration of precipitation, and minimize potential for contaminants to leach to groundwater. The composite cap could also include biotic barriers and erosion control measures. In addition to the cap itself, this alternative also includes landfill gas controls, ICs, and monitoring. The ICs would restrict land use to prevent uncontrolled excavation or other activities that could damage the cap and create exposure pathways to human and ecological receptors. Site controls, such as fencing, signage, and security, would be implemented to restrict access to the cap as necessary. Monitoring and enforcement of the ICs would also be required.

Alternative VOC4 (SVE) was evaluated for CS 038, CS S-007, CS S-026, CS T-016, CS T-020, CS T-057, SA 080, SA 097, SA 100, and SA 107 because these sites are within or are anticipated to be within the radius of influence of an SVE system that will continue to operate; however, Alternative VOC4 was determined to be not technically feasible, effective in the short- or long-term, or cost effective due to the fact that soil gas contamination is widely distributed and that SVE may not be able to reduce SSG concentrations to levels that are protective of indoor air. Alternative Non-VOC2 (ICs, ECs) was evaluated for all 43 FOSET #2 Action Sites; however, Alternative Non-VOC2 is not effective for protecting workers, ecological receptors, or water quality. Alternative Non-VOC3 (Bioventing) was only evaluated for sites with TPH contamination, including CS 038, CS S-026, CS T-012, CS T-016, CS T-017, CS T-020, CS T-021, CS T-047, PRL S-017, PRL S-043, PRL T-032, SA 045, SA 060, SA 066, and SA 096; however, Alternative Non-VOC3 was determined to be more difficult to implement than excavation and is more expensive than excavation. In addition, the timeframe required to achieve cleanup levels and the effectiveness are uncertain for Alternative Non-VOC3. Lastly, Alternative Non-VOC3 would not address other types of soil contaminants that are present, such as metals and PCBs. Under Alternative Non-VOC5, future land use would be permanently restricted to activities that would not damage the cap and create exposure pathways. Only disposal pit sites were evaluated for Alternative Non-VOC5; however, none of the FOSET #2 Action Sites are disposal pits. Alternative VOC4 (SVE), Alternative Non-VOC2 (ICs, ECs), Alternative Non-VOC3 (Bioventing), and Alternative Non-VOC5 (Capping) were not selected and are not discussed further in this ROD. Alternative 1 (No Further Action) was not selected for any of the Action Sites; however, this alternative is discussed in Table 2-6 as a baseline for comparative analysis purposes. Alternative VOC2 (Institutional Controls to Prohibit Residential Use [Restricted Land Use]), Alternative VOC3 (Institutional Controls to Mitigate Shallow Soil Gas Contamination [Restricted Land Use]), Alternative Non-VOC4a (Excavation and Disposal [Restricted Land Use]), and Alternative Non-VOC4b (Excavation and Disposal [Unrestricted Land Use]) were selected for one or more sites. Please see Table 1-2 for a summary of the alternative(s) selected for each site.

2.9.1 Common Elements and Distinguishing Features of Each Alternative

These alternatives include common elements, as well as distinguishing features unique to each option. The following discussion summarizes the common elements and distinguishing features of the alternatives. As previously noted, not all of the alternatives were evaluated for every site.

2.9.1.1 Common Elements

Common elements for the alternatives are as follows:

- All of the alternatives, except for Alternatives 1 (No Further Action) and Non-VOC4b, result in restricted (i.e., limited or industrial) land use and include ICs.

- Alternatives VOC2, VOC3, and Non-VOC4a require monitoring of the ICs. Alternative Non-VOC4a may also require sediment monitoring. Contamination left in place triggers ARARs for ICs and, in cases with potential impacts to surface water or groundwater, ARARs for monitoring requirements.

- All of the alternatives, except for Alternative 1 for sites with unacceptable risks, are compatible with intended site reuse.

- All of the alternatives, except for Alternative 1, are expected to be completed and facilitate reuse within less than a year to 3 years.

2.9.1.2 Distinguishing Features

The distinguishing features of Alternative 1 are that no remedial action would take place under this alternative and that there is no cost associated with this alternative.

ECs (e.g., surface cover and sediment collection systems) are a distinguishing feature of Alternatives VOC3 and Non-VOC4a. Under Alternative VOC3, vapor controls (e.g., vapor barrier, gas collection, or ventilation) would prevent worker exposure to soil gas and support the overall protectiveness of the remedy. It is expected that ECs (e.g., vapor barrier, gas collection, or ventilation) could be designed, planned, and installed within 6 months to 1 year. Under Alternative Non-VOC4a, surface cover (e.g., asphalt, concrete, or building foundations) would provide a physical barrier to prevent direct contact with contaminated soil and prevent erosion and associated impacts to surface water. Sediment collection systems would also prevent direct contact and surface water impacts because contaminated sediment would be collected and removed. These will support the overall protectiveness of the remedy. It is expected that ECs (e.g., surface cover or sediment collection systems) could be designed, planned, and installed within 6 months to 1 year.

The distinguishing feature of Alternatives Non-VOC4a and Non-VOC4b is excavation and disposal of excavated wastes. The long-term reliability of these alternatives is high because the waste is removed from the site and placed into an appropriate facility; however, excavation of large volumes is expensive. It is expected that most excavations under Alternatives Non-VOC4a and Non-VOC4b could be planned and executed within 6 months to 1 year. A further distinguishing feature of Alternative Non-VOC4b is that this alternative will result in unrestricted land use.

2.10 SUMMARY OF COMPARATIVE ANALYSIS OF REMEDY ALTERNATIVES

In accordance with the NCP (Section 300.430(f)(5)(i)), the remedial alternatives were evaluated against the following nine criteria:

- **Criterion 1: Overall Protection of Human Health and the Environment –** This criterion addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, ECs, and/or ICs. In every ROD, a "no action" alternative is considered as a baseline for comparative analysis purposes. In cases where the no action alternative is found to not meet this criterion, it is ruled out for further consideration and therefore, need not be discussed further in the nine criteria analysis.

- **Criterion 2: Compliance with ARARs –** This criterion addresses whether each alternative complies with federal and state requirements that are applicable or relevant and appropriate to the remedial action. Section 121(d) of CERCLA and NCP 300.430(f)(1)(ii)(B) require that remedial

actions at CERCLA sites attain ARARs, unless such ARARs are waived under CERCLA Section 121(d)4. For an alternative to pass into the detailed analysis stage and thus become eligible for selection it must comply with its ARARs or a waiver should be identified and the justification provided for invoking it. An alternative that cannot comply with ARARs or for which a waiver cannot be justified, is eliminated from consideration for further discussion as a potential alternative in the Proposed Plan or ROD.

- **Criterion 3: Long-term Effectiveness and Permanence** – Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. This criterion includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls. Long-term effectiveness and permanence of an alternative are viewed along a continuum (i.e., an alternative can offer a greater or lesser degree of long-term effectiveness and permanence). Alternatives that are more effective in the long term are more permanent.

- **Criterion 4: Reduction of Toxicity, Mobility, or Volume through Treatment** – Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy. Each characteristic is analyzed independently and collectively to determine how effectively treatment is being employed by the remedial alternative. In addition, other elements such as the risks posed by residuals are considered.

- **Criterion 5: Short-term Effectiveness** – Short-term effectiveness considers the amount of time until the remedy effectively protects human health and the environment at the site. It also includes an evaluation of the adverse effects the remedy may pose to workers, the community, and the environment during implementation. Possible adverse effects should be evaluated in advance to determine mitigative steps to adequately minimize the impact to workers, the community, or the environment and to minimize any risks that would remain at the site.

- **Criterion 6: Implementability** – Implementability considers the ease of implementing the remedy in terms of construction and operation, and the availability of services and materials required to implement the alternative. Technical consideration also includes the reliability of the technology, the effect on future remedial action options, and monitoring at the site. Variables such as the site's topography, location, and available space are considered. Implementability is significant when evaluating treatment technologies that are dependent on resources such as facilities, equipment, professionals or experts, and especially technologies that have not been proven effective. In addition, administrative feasibility, which includes activities that need to be coordinated with other offices and agencies, is addressed when analyzing this criterion.

- **Criterion 7: Cost** – The cost of an alternative addresses all engineering, construction, and O&M costs incurred over the life of the project. The assessment against this criterion is based on the estimated present worth of these costs for each alternative. Present worth is used to estimate expenditures that occur over different lengths of time. The costs of remedies always are qualified as estimates with an expected accuracy of +50% to -30%.

- **Criterion 8: State Acceptance** – This assessment evaluates the technical and administrative issues, concerns, and preferences the State agencies may have regarding each of the alternatives. Resource agencies have reviewed the site documents and have agreed with the selected remedies. Major support agency comments must be summarized under this criterion and the lead agency's response to those comments are also summarized.

- **Criterion 9: Community Acceptance** – This assessment evaluates the issues, concerns, and preferences the public may have regarding each of the alternatives. Because information available on the community acceptance criterion may be limited before the public comment period for the Proposed Plan, this factor is fully evaluated in the ROD.

The nine criteria are categorized as threshold criteria, primary balancing criteria, or modifying criteria. Threshold criteria are requirements that each alternative must meet to be eligible for selection as the preferred alternative. The threshold criteria are 1 and 2 – overall protection of human health and the environment and compliance with ARARs. Primary balancing criteria are used to weigh effectiveness and cost tradeoffs among alternatives. They are the main technical criteria upon which the alternative evaluation is based. The balancing criteria are 3 through 7 – long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost. Modifying criteria may be used to modify aspects of the preferred alternative when preparing this ROD. The modifying criteria are 8 and 9 – State acceptance and community acceptance.

The comparative analysis of alternatives based on the threshold and balancing criteria is summarized in Table 2-6. Site-specific details were considered when comparing the performance of each alternative. However, not all of the alternatives are evaluated for each site because not all alternatives are appropriate at every site.

2.10.1 VOC Alternatives

In the FSs (CH2MHill, 2010, 2011, and 2012), the VOC alternatives were evaluated at the Action Sites for which COCs for SSG have been identified. Each of these sites was evaluated for Alternative 1 and Alternative VOC2. Additionally, due to risks (or potential risks) associated with SSG within, or greater than, the risk management range (1×10^{-4} to 1×10^{-6} carcinogenic risk) for restricted use, Alternative VOC3 was evaluated.

The overall ranking of VOC alternatives varies by site upon consideration of numerous factors within the balancing criteria, including the level of existing risk to human health, current and future land use, and incremental cost (i.e., the cost difference between alternatives). In general, Alternative VOC3 is most often the highest ranking (i.e., most preferable) alternative because it is the most protective and is typically not significantly more expensive. However, for sites with commercial/industrial risks below the risk management range, the additional cost and restrictions for Alternative VOC3 may not be justified and Alternative VOC2 is preferable.

There are no actions associated with Alternative 1. Therefore, there are no technical impediments to implementing Alternative 1. For Alternatives VOC2 and VOC3, land reuse might be constrained by the ICs and risk of future exposure might exist if monitoring is insufficient to detect failure of an IC. Significant coordination will be required between AFCEC, Sacramento County, DTSC, and the Central Valley Water Board for these alternatives to be successful. The ECs associated with Alternative VOC3 will be readily implementable, and vendors are readily available. Installing a vapor barrier and gas collection system in an occupied building will require coordination with current tenants.

A summary of the comparative analysis of alternatives for these sites from the FSs is presented in Table 2-6.

2.10.2 Non-VOC Alternatives

In the FSs (CH2MHill, 2010, 2011, and 2012), the Non-VOC alternatives were evaluated at all FOSET # 2 Action Sites. Only two Non-VOC alternatives (i.e., Alternatives Non-VOC4a and Non-VOC4b) were selected for the FOSET #2 Action Sites.

The overall ranking of Non-VOC alternatives varies by site upon consideration of numerous factors within the balancing criteria, including the level of existing risk to human health, the types of contaminants present, the potential for impacts to water quality, the potential for direct or indirect impacts to nearby wetlands, current and future land use, and incremental cost (i.e., the cost difference between alternatives).

In general, excavation/disposal (Alternatives Non-VOC4a and Non-VOC4b) is more preferable than No Further Action) because contaminated soil would be physically removed. Alternative Non-VOC4a or Alternative Non-VOC4b was selected for each of the 43 FOSET # 2 Action Sites. Between Alternatives Non-VOC4a and Non-VOC4b, Alternative Non-VOC4b has the advantage of not requiring long-term ICs or monitoring, but in many cases there are significantly higher costs for excavation/disposal to achieve unrestricted use cleanup levels. In other cases, there is also uncertainty regarding the cost to achieve unrestricted use cleanup levels under Alternative Non-VOC4b.

There are no actions associated with Alternative 1. Therefore, there are no technical impediments to implementing Alternative 1. For Alternatives Non-VOC4a and Non-VOC4b, excavation with accompanying equipment are readily implementable, technically feasible, and reliable; however, it will be subject to potential capacity limitations regarding the amount of waste received at an offsite landfill at one time. At many sites, these alternatives need to be implemented along with another alternative to address VOCs in shallow soil gas.

A summary of the comparative analysis of alternatives for these sites from the three FS is presented in Table 2-6.

Table 2-6 Comparative Analysis of Both VOC and Non-VOC Alternatives

Site	Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectivess and Performance	Reduction in Toxicity, Mobility, and Volume Through Treatment	Short-term Effectiveness	Implementability	Cost (PV_{30})
AOC G-3	VOC3 would be the most protective for future use if a new building is constructed; however, both VOC2 and VOC3 would prohibit unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Risks are greater than the risk management range for unrestricted use and within the risk management range for restricted use. Risks under VOC3 would be acceptable. Risks under VOC2 would be acceptable. Risks under No Further Action would not be acceptable. The long-term effectiveness and permanence of the institutional controls under VOC2 and VOC3 would be nearly equal for potential residents; however, the long-term reliability and permanence of VOC3 would be increased for industrial/commercial reuse relative to VOC2 with the addition of engineered controls, which would control migration of soil gas into indoor air. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water. The criterion for long-term effectiveness and permanence would not be met under No Further Action, except to the extent that VOCs would attenuate naturally, which would provide some degree of long-term reduction in risk at the site.	Because engineered controls under VOC3 would limit or eliminate the vapor inhalation pathway, mobility of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2 and No Further Action. Reduction by natural processes only would occur under VOC2 and No Further Action. None of the evaluated alternatives meet the statutory preference for treatment. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included. None of the evaluated alternatives meet the statutory preference for treatment.	VOC2 and VOC3 would be effective immediately. Implementation of VOC2 would entail no significant adverse risks to the environment or health of the community and workers. Short-term risks during the implementation of engineered controls under VOC3 would be minimal because of limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All of the evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $196,000 Non-VOC4a = $2,128,000 Non-VOC4b = $2,048,000
AOC G-4	VOC3 would be the most protective for SSG for future use if a new building is constructed or an existing building is renovated; however, both VOC2 and VOC3 would prohibit unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective for soil because contaminants would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Risks are greater than the risk management range for unrestricted use and within the risk management range for restricted use. Risks under VOC3 would be acceptable. Risks under VOC2 may be acceptable. Risks under No Further Action would not be acceptable. The long-term effectiveness and permanence of the institutional controls under VOC2 and VOC3 would be nearly equal for potential residents; however, the long-term reliability and permanence of VOC3 would be increased for industrial/commercial reuse relative to VOC2 with the addition of engineered controls, which would control migration of soil gas into indoor air. Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water. The criterion for long-term effectiveness and permanence would not be met under No Further Action, except to the extent that VOCs would attenuate naturally, which would provide some degree of long-term reduction in risk at the site.	Because engineered controls under VOC3 would limit or eliminate the vapor inhalation pathway, mobility of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2 and No Further Action. Reduction by natural processes only would occur under VOC2 and No Further Action. None of the evaluated alternatives meet the statutory preference for treatment. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included. None of the evaluated alternatives meet the statutory preference for treatment.	VOC2 and VOC3 would be effective immediately. Implementation of VOC2 would entail no significant adverse risks to the environment or health of the community and workers. Short-term risks during the implementation of engineered controls under VOC3 would be minimal because of limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All of the evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $422,000 Non-VOC4a = $867,000 Non-VOC4b = $910,000

Site	Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectivess and Performance	Reduction in Toxicity, Mobility, and Volume Through Treatment	Short-term Effectiveness	Implementability	Cost (PV_{30})
AOC G-5	VOC3 would be the most protective for SSG for future use if a new building is constructed or an existing building is renovated; however, both VOC2 and VOC3 would prohibit unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective for soil because contaminants would be physically removed; however, sensitive species and habitat would be directly impacted by the removal and excavation may also indirectly impact other nearby wetlands. Only Non-VOC4a and Non-VOC4b would be protective of ecological receptors via the removal of contaminants and the mitigation of habitat. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Risks are within the risk management range for unrestricted use and at the low end of the risk management range for restricted use. Risks under VOC3 would be acceptable. Risks under No Further Action and VOC2 may be acceptable. The long-term effectiveness and permanence of the institutional controls under VOC2 and VOC3 would be nearly equal for potential residents; however, the long-term reliability and permanence of VOC3 would be increased for industrial/commercial reuse relative to VOC2 with the addition of engineered controls, which would control migration of soil gas into indoor air. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water. The criterion for long-term effectiveness and permanence would not be met under No Further Action.	Because engineered controls under VOC3 would limit or eliminate the vapor inhalation pathway, mobility of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2 and No Further Action. Reduction by natural processes only would occur under VOC2 and No Further Action. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included. None of the evaluated alternatives meet the statutory preference for treatment.	VOC2 and VOC3 would be effective immediately. Implementation of VOC2 would entail no significant adverse risks to the environment or health of the community and workers. Short-term risks during the implementation of engineered controls under VOC3 would be minimal because of limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All of the evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $246,000 Non-VOC4a = $1,642,000 Non-VOC4b = $2,600,000
CS 038	VOC3 would provide additional protection compared to VOC2. VOC2 would effectively prevent unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective for soil because TPH-G would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action and VOC2.	Risks under VOC3 would be acceptable. SSG risks for restricted use are greater than the risk management range. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. However, Non-VOC4a would also be effective and permanent, given that monitoring would be performed to verify that residual contamination does not impact the environment. Current soil risks for restricted use (excluding arsenic) are less than the risk management range.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Under VOC3, the IC 37 SVE system will continue to operate for protection groundwater quality which will effectively minimize vapor intrusion into the building. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Coordination with the SVE program would be required for the non-VOC alternatives. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b). The target excavation volume is adjacent to Building 475, which could complicate excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $391,000 Non-VOC4a = $194,000 Non-VOC4b = $114,000
CS 040/ PRL S-006/ PRL S-019	VOC3 would be the most protective for SSG, but VOC2 would effectively prevent unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective for soil because contaminants would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	VOC2 may comply with ARARs[1]. All other evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Risks under VOC2 may be acceptable. Risks under VOC3 would be acceptable. SSG risks for restricted use are within the risk management range. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water. Current soil risks for restricted use are at the upper end of the risk management range.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $196,000 Non-VOC4a* = $2,546,500 Non-VOC4b* = $2,905,438

Site	Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectivess and Performance	Reduction in Toxicity, Mobility, and Volume Through Treatment	Short-term Effectiveness	Implementability	Cost (PV_{30})
CS B-005	No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use. VOC2 would effectively prevent unrestricted use. Non-VOC4a and Non-VOC4b would be the most protective for soil because contaminants would be physically removed.	VOC2 would comply with ARARs. Non-VOC4a and Non-VOC4b would comply with ARARs. No Further Action would not comply with ARARs.	Risks under VOC2 would be acceptable. SSG risks for unrestricted use are at the low end of the risk management range and risks for restricted use are less than the risk management range. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls would provide continued protection of human health. Current soil risks are greater than the risk management range for restricted use.	VOC2 would not provide any additional reduction over No Further Action. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 would be effective immediately. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 Non-VOC4a* = $1,727,900 Non-VOC4b* = $6,667,962
CS S-007	VOC3 would be the most protective for SSG, but VOC2 would effectively prevent unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	VOC2 may comply with ARARs[1]. All other evaluated alternatives would comply with ARARs with the exception of No Further Action.	Risks under VOC2 may be acceptable. Risks under VOC3 would be acceptable. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water, and monitoring would be performed to verify that residual contamination does not impact the environment. Current risks for restricted use are within the risk management range.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Coordination with the SVE program would be required for the non-VOC alternatives. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $173,000 Non-VOC4a = $277,000 Non-VOC4b = $185,000
CS S-024	VOC3 would be the most protective, but VOC2 would effectively prevent unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective, considering risks are within the risk management range for unrestricted use; however, the HI is greater than 1.	VOC2 may comply with ARARs[1]. All other evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Risks under VOC2 may be acceptable. Risks under VOC3 would be acceptable. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water, and monitoring would be performed to verify that residual contamination does not impact the environment. Current risks for restricted use are at the low end of the risk management range.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Coordination with the SVE program would be required for the non-VOC alternatives. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b). The target excavation volume is located near the corner of Building 375, which could complicate excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $555,000 Non-VOC4a = $205,000 Non-VOC4b = $138,000

Site	Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectivess and Performance	Reduction in Toxicity, Mobility, and Volume Through Treatment	Short-term Effectiveness	Implementability	Cost (PV_{30})
CS S-026	VOC3 would provide additional protection compared to VOC2. VOC2 would effectively prevent unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective for soil because TPH would be physically removed. No Further Action would not be protective considering risks are greater than the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action and VOC2.	Risks under VOC3 would be acceptable. SSG risks for restricted use are greater than the risk management range, and thus the risks under VOC2 would be unacceptable. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. However, Non-VOC4a would also be effective and permanent given that monitoring would be performed to verify that residual contamination does not impact the environment. Current soil risks for restricted use (excluding arsenic) are less than the risk management range.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Coordination with the SVE program would be required for the non-VOC alternatives. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $196,000 Non-VOC4a = $180,000 Non-VOC4b = $101,000
CS T-012/ CS T-021	Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective considering risks are within the risk management range for unrestricted use; however, the HI is greater than 1. In addition potential impacts to water quality would remain.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. However, Non-VOC4a would also be effective and permanent given that institutional controls would provide continued protection of human health, and monitoring would be performed to verify that residual contamination does not impact the environment. Current risks for restricted use are less than the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	Non-VOC4a = $273,000 Non-VOC4b = $194,000
CS T-016	VOC3 would provide additional protection compared to VOC2. VOC2 would effectively prevent unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective for soil because TPH would be physically removed. No Further Action may be protective considering risks are within the risk management range for unrestricted use; however, the HI is greater than 1. In addition, potential impacts to water quality would remain.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action. VOC2 may comply with ARARs[1].	Risks under No Further Action may be acceptable. Risks under VOC2 would be acceptable. Risks under VOC3 would be acceptable. Risks for unrestricted use are within the risk management range. Risks for restricted use are at the low end of the risk management range. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. However, Non-VOC4a would also be effective and permanent given that monitoring would be performed to verify that residual contamination does not impact the environment.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Coordination with the SVE program would be required for the non-VOC alternatives. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $173,000 Non-VOC4a = $192,000 Non-VOC4b = $112,000
CS T-017	Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective considering risks are within the risk management range for unrestricted use; however, the HI is greater than 1. In addition, potential impacts to water quality would remain.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water, and monitoring would be performed to verify that residual contamination does not impact the environment. Current risks for restricted use (excluding arsenic) are less than the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	Non-VOC4a = $213,000 Non-VOC4b = $105,000

Site	Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectivess and Performance	Reduction in Toxicity, Mobility, and Volume Through Treatment	Short-term Effectiveness	Implementability	Cost (PV_{30})
CS T-020	VOC3 would provide additional protection compared to VOC2. VOC2 would effectively prevent unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective because TPH would be physically removed. No Further Action may be protective considering risks are within the risk management range for unrestricted use; however, the HI is greater than 1. In addition, potential impacts to water quality would remain.	VOC2 may comply with ARARs[1]. All other evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Risks under VOC3 would be acceptable. Risks under No Further Action and VOC2 may be acceptable. Risks are at the low end of the risk management range for unrestricted use and less than the risk management range for restricted use. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. However, Non-VOC4a would also be effective and permanent given that monitoring would be performed to verify that residual contamination does not impact the environment.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Coordination with the SVE program would be required for the non-VOC alternatives. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $173,000 Non-VOC4a = $319,000 Non-VOC4b = $240,000
CS T-030/ PRL S-018	Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective considering risks are within the risk management range for unrestricted use; however, the HI exceeds 1.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls would provide continued protection of human health. Current risks for restricted use are within the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	Non-VOC4a* = $2,066,200 Non-VOC4b* = $1,748,000
CS T-036	Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective, considering risks are within the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls would provide continued protection of human health. Current risks for restricted use are within the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	Non-VOC4a = $178,000 Non-VOC4b = $99,000
CS T-047	VOC3 would be the most protective for SSG, but VOC2 would effectively prevent unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective for soil because contaminants would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action and VOC2. VOC2 may comply with ARARs[1].	Risks under VOC2 may be acceptable. Risks under VOC3 would be acceptable. Risks for restricted use are within the risk management range. Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. However, Non-VOC4a would also be effective and permanent, given that institutional controls would provide continued protection of human health, and monitoring would be performed to verify that residual contamination does not impact the environment.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $196,000 Non-VOC4a = $328,000 Non-VOC4b = $249,000

Site	Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectivess and Performance	Reduction in Toxicity, Mobility, and Volume Through Treatment	Short-term Effectiveness	Implementability	Cost (PV_{30})
CS T-057/ SA 080/ SA 107	VOC3 would provide additional protection compared to VOC2. VOC2 would effectively prevent unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective for soil because contaminants would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action and VOC2. VOC2 may comply with ARARs[1].	Risks under VOC2 may be acceptable. Risks under VOC3 and VOC4 would be acceptable. Risks for restricted use are within the risk management range. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Coordination with the SVE program would be required for the non-VOC alternatives. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $196,000 Non-VOC4a = $278,000 Non-VOC4b = $113,000
PRL S-001	No Further Action would not be protective because the HI exceeds 1. VOC3 would be the most protective, but VOC2 would effectively prevent unrestricted use. Non-VOC4a and Non-VOC4b would be the most protective for soil because contaminants would be physically removed.	VOC2 may comply with ARARs[1]. All other evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Risks under No Further Action may be acceptable. Risks under VOC2 may be acceptable. Risks under VOC3 would be acceptable. Risks for both unrestricted and restricted use are within the risk management range. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water. Lead in one sample beneath Building 343 exceeds the restricted use CL.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Coordination with the SVE program would be required for the non-VOC alternatives. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b). The restricted use target excavation volume is located beneath Building 3343, which could complicate excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $305,000 Non-VOC4a = $204,000 Non-VOC4b = $141,000
PRL S-002	Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective considering risks are within the risk management range for unrestricted use; however, the HI exceeds 1.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water. Current risks for restricted use are within the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	Non-VOC4a = $289,000 Non-VOC4b = $1,152,000
PRL S-017	VOC3 would be the most protective for SSG, but VOC2 would effectively prevent unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective for soil because TPH would be physically removed. No Further Action may be protective, considering risks are within the risk management range for unrestricted use; however, potential impacts to water quality would remain.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action and VOC2. VOC2 may comply with ARARs[1].	Risks under VOC2 may be acceptable. Risks under VOC3 would be acceptable. Risks for restricted use are at the low end of the risk management range. Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. However, Non-VOC4a would also be effective and permanent, given that monitoring would be performed to verify that residual contamination does not impact the environment.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Coordination with the SVE program would be required for the non-VOC alternatives. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $701,000 Non-VOC4a = $232,000 Non-VOC4b = $152,000

Site	Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectivess and Performance	Reduction in Toxicity, Mobility, and Volume Through Treatment	Short-term Effectiveness	Implementability	Cost (PV_{30})
PRL S-025	Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective, considering risks are within the risk management range for unrestricted use; however the HI exceeds 1.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water, and monitoring would be performed to verify that residual contamination does not impact the environment. Current risks for restricted use are less than the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	Non-VOC4a = $205,000 Non-VOC4b = $146,000
PRL S-036	Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective, considering risks are within the risk management range for unrestricted use; however, the HI exceeds 1.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. Current risks for restricted use are less than the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4b).	Non-VOC4b = $107,000
PRL S-043	VOC3 would be the most protective for future use for SSG if a new building is constructed; however, both VOC2 and VOC3 would prohibit unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective for soil because contaminants would be physically removed. No Further Action may be protective, considering risks are within the risk management range for unrestricted use; however, the HI exceeds 1. In addition, potential impacts to water quality would remain.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Risks are within the risk management range for unrestricted use and at the low end of the risk management range for restricted use. Risks under VOC3 would be acceptable. Risks under No Further Action and VOC2 may be acceptable. The long-term effectiveness and permanence of the institutional controls under VOC2 and VOC3 would be nearly equal for potential residents; however, the long-term reliability and permanence of VOC3 would be increased for industrial/commercial reuse relative to VOC2 with the addition of engineered controls, which would control migration of soil gas into indoor air. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water, and monitoring would be performed to verify that residual contamination does not impact the environment. The criterion for long-term effectiveness and permanence would not be met under No Further Action.	Because engineered controls under VOC3 would limit or eliminate the vapor inhalation pathway, mobility of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2 and No Further Action. Reduction by natural processes only would occur under VOC2 and No Further Action. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. Implementation of VOC2 would entail no significant adverse risks to the environment or health of the community and workers. Short-term risks during the implementation of engineered controls under VOC3 would be minimal because of limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All of the evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $196,000 Non-VOC4a = $204,000 Non-VOC4b = $125,000

Site	Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectivess and Performance	Reduction in Toxicity, Mobility, and Volume Through Treatment	Short-term Effectiveness	Implementability	Cost (PV_{30})
PRL S-044	VOC3 would be the most protective for SSG for future use if a new building is constructed; however, both VOC2 and VOC3 would prohibit unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective for soil because contaminants would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Risks are greater than the risk management range for unrestricted use and at the low end of the risk management range for restricted use. Risks under VOC3 would be acceptable. Risks under VOC2 may be acceptable. Risks under No Further Action would not be acceptable. The long-term effectiveness and permanence of the institutional controls under VOC2 and VOC3 would be nearly equal for potential residents; however, the long-term reliability and permanence of VOC3 would be increased for industrial/commercial reuse relative to VOC2 with the addition of engineered controls, which would control migration of soil gas into indoor air. The criterion for long-term effectiveness and permanence would not be met under No Further Action, except to the extent that VOCs would attenuate naturally, which would provide some degree of long-term reduction in risk at the site. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. The criterion for long-term effectiveness and permanence would not be met under No Further Action.	Because engineered controls under VOC3 would limit or eliminate the vapor inhalation pathway, mobility of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2 and No Further Action. Reduction by natural processes only would occur under VOC2 and No Further Action. None of the evaluated alternatives meet the statutory preference for treatment. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. Implementation of VOC2 would entail no significant adverse risks to the environment or health of the community and workers. Short-term risks during the implementation of engineered controls under VOC3 would be minimal because of limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4b).	VOC2 = $88,000 VOC3 = $196,000 Non-VOC4a = $1,610,000 Non-VOC4b = $3,054,000
PRL S-045	VOC2 would be the most protective for SSG because unrestricted use would be prohibited. No Further Action would not be protective. Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective, considering risks are within the risk management range for unrestricted use; however, the HI exceeds 1. In addition, potential impacts to water quality would remain.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Risks are within the risk management range for unrestricted use and less than the risk management range for restricted use. Risks under VOC2 would be acceptable. Risks under No Further Action may be acceptable. The long-term effectiveness and permanence of the institutional controls under VOC2 would depend on the maintenance, monitoring, and enforcement of the institutional controls. Current risks are within the risk management range for unrestricted use and less than the risk management range for restricted use. Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. The criterion for long-term effectiveness and permanence would not be met under No Further Action.	Reduction by natural processes only would occur under VOC2and No Further Action, but could not be evaluated because no monitoring is included. None of the evaluated alternatives meet the statutory preference for treatment. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4b.	VOC2 would be effective immediately. Implementation of VOC2 would entail no significant adverse risks to the environment or health of the community and workers. Short-term risks during excavation (Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All of the evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4b).	VOC2 = $88,000 Non-VOC4b = $212,000

Site	Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectivess and Performance	Reduction in Toxicity, Mobility, and Volume Through Treatment	Short-term Effectiveness	Implementability	Cost (PV_{30})
PRL T-032	VOC3 would be the most protective for SSG for future use if a new building is constructed; however, both VOC2 and VOC3 would prohibit unrestricted use. No Further Action would not be protective. Considering risks are greater than the risk management range for restricted use, VOC2 would not be protective for future use if a new building is constructed. Non-VOC4a and Non-VOC4b would be the most protective for soil because contaminants would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs with the exception of No Further Action and VOC2.	Risks are greater than the risk management range for both unrestricted and restricted use. Risks under VOC3 would be acceptable. Risks under VOC2 and No Further Action would not be acceptable. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, levels acceptable for restricted use would be achieved. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water, and monitoring would be performed to verify that residual contamination does not impact the environment. The criterion for long-term effectiveness and permanence would not be met under No Further Action.	Because engineered controls under VOC3 would limit or eliminate the vapor inhalation pathway, mobility of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2 and No Further Action. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under VOC2, VOC3, and No Further Action, but could not be evaluated because no monitoring is included.	VOC3 would be effective immediately. Short-term risks during the implementation of engineered controls under VOC3 would be minimal because of limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $159,000 Non-VOC4a = $878,000 Non-VOC4b = $799,000
SA 004	VOC3 would be the most protective for SSG for future use if a new building is constructed; however, both VOC2 and VOC3 would prohibit unrestricted use. No Further Action would not be protective. Non-VOC4b would be the most protective for soil because contaminants would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Risks are greater than the risk management range for unrestricted use and within the risk management range for restricted use. Risks under VOC3 would be acceptable. Risks under VOC2 may be acceptable. Risks under No Further Action would not be acceptable. The long-term effectiveness and permanence of the institutional controls under VOC2 and VOC3 would be nearly equal for potential residents; however, the long-term reliability and permanence of VOC3 would be increased for industrial/commercial reuse relative to VOC2 with the addition of engineered controls, which would control migration of soil gas into indoor air. The criterion for long-term effectiveness and permanence would not be met under No Further Action, except to the extent that VOCs would attenuate naturally, which would provide some degree of long-term reduction in risk at the site. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. The criterion for long-term effectiveness and permanence would not be met under No Further Action.	Because engineered controls under VOC3 would limit or eliminate the vapor inhalation pathway, mobility of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2 and No Further Action. Reduction by natural processes only would occur under VOC2 and No Further Action, but could not be evaluated because no monitoring is included. None of the evaluated alternatives meet the statutory preference for treatment. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4b.	VOC2 and VOC3 would be effective immediately. Implementation of VOC2 would entail no significant adverse risks to the environment or health of the community and workers. Short-term risks during the implementation of engineered controls under VOC3 would be minimal because of limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All of the evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4b).	VOC2 = $88,000 VOC3 = $196,000 Non-VOC4a = $171,000 Non-VOC4b = $92,000
SA 045	Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective, considering risks are within the risk management range for unrestricted use; however, the HI exceeds 1.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. However, Non-VOC4a would also be effective and permanent, given that institutional controls would provide continued protection of human health, and monitoring would be performed to verify that residual contamination does not impact the environment. Current risks for restricted use are at the low end of the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	Non-VOC4a = $444,000 Non-VOC4b = $365,000

Site	Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectivess and Performance	Reduction in Toxicity, Mobility, and Volume Through Treatment	Short-term Effectiveness	Implementability	Cost (PV_{30})
SA 049	Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective, considering risks are within the risk management range for unrestricted use; however, the HI exceeds 1. In addition, potential impacts to water quality would remain.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water. Current risks (without arsenic) for restricted use are less than the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	Non-VOC4a = $203,000 Non-VOC4b = $129,000
SA 055	Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective, considering risks are within the risk management range for unrestricted use; however, the HI exceeds 1.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. Current risks for restricted use are less than the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4b).	Non-VOC4b = $89,000
SA 060	Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective, considering risks are greater than the risk management range for unrestricted use; however, the HI exceeds 1. In addition, potential impacts to the environment would remain.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of surface water, and monitoring would be performed to verify that residual contamination does not impact the environment. Current risks for restricted use (excluding cadmium and thallium) are less than the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	Non-VOC4a = $191,000 Non-VOC4b = $92,000
SA 063	Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	Non-VOC4a and Non-VOC4b would comply with ARARs. No Further Action would not comply with ARARs.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water. Current risks for restricted use are greater than the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	Non-VOC4a = $452,000 Non-VOC4b = $517,000
SA 066	VOC3 would be the most protective for SSG, but VOC2 would effectively prevent unrestricted use. Non-VOC4a and Non-VOC4b would be the most protective for soil because TPH-D would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action and VOC2.	Risks under VOC3 would be acceptable. Risks for restricted use are greater than the risk management range. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. However, Non-VOC4a would also be effective and permanent, given that monitoring would be performed to verify that residual contamination does not impact the environment. Current risks for restricted use are less than the risk management range.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Coordination with the SVE program would be required for the non-VOC alternatives. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b). The target excavation volume is adjacent to Building 357, which could complicate excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $190,000 Non-VOC4a = $167,000 Non-VOC4b = $88,000

Site	Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectivess and Performance	Reduction in Toxicity, Mobility, and Volume Through Treatment	Short-term Effectiveness	Implementability	Cost (PV_{30})
SA 096	Non-VOC4a and Non-VOC4b would be the most protective because TPH would be physically removed. No Further Action may be protective, considering risks are within the risk management range for unrestricted use; however, potential impacts to water quality would remain.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. However, Non-VOC4a would also be effective and permanent, given that monitoring would be performed to verify that residual contamination does not impact the environment. Current risks for restricted use (excluding arsenic) are less than the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	Non-VOC4a = $201,000 Non-VOC4b = $122,000
SA 097	VOC3 would provide additional protection compared to VOC2. VOC2 would effectively prevent unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective for soil because contaminants would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action and VOC2. VOC2 may comply with ARARs[1].	Risks under VOC2 may be acceptable. Risks under VOC3 would be acceptable. Risks for restricted use are within the risk management range. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water, and monitoring would be performed to verify that residual contamination does not impact the environment.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Coordination with the SVE program would be required for the non-VOC alternatives. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $173,000 Non-VOC4a = $170,000 Non-VOC4b = $91,000
SA 100	VOC3 would provide additional protection compared to VOC2. VOC2 would effectively prevent unrestricted use. No Further Action would not be protective. Non-VOC4a and Non-VOC4b would be the most protective for soil because contaminants would be physically removed. No Further Action would not be protective, considering risks are greater than the risk management range for unrestricted use.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action and VOC2. VOC2 may comply with ARARs[1].	Risks under VOC3 would be acceptable. Risks under VOC2 may be acceptable. Risks are greater than the risk management range for unrestricted use and within the risk management range for restricted use. Non-VOC4b would be the most effective and permanent for soil because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water.	Mobility and volume of VOCs in SSG would be reduced to a greater extent under VOC3 compared to VOC2. Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	VOC2 and VOC3 would be effective immediately. VOC3 would involve limited disruption of shallow soils. Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Coordination with the SVE program would be required for the non-VOC alternatives. Current site use would be disrupted during excavation (Non-VOC4a and Non-VOC4b).	VOC2 = $88,000 VOC3 = $173,000 Non-VOC4a = $257,000 Non-VOC4b = $89,000
SA 109 (F2)	Non-VOC4a and Non-VOC4b would be the most protective because contaminants would be physically removed. No Further Action may be protective, considering risks are within the risk management range for unrestricted use; however, the HI exceeds 1.	All evaluated alternatives would comply with ARARs, with the exception of No Further Action.	Non-VOC4b would be the most effective and permanent because levels acceptable for unrestricted use would be achieved by excavation and disposal. Under Non-VOC4a, residual contamination would remain; however, institutional controls and engineered controls would provide continued protection of human health and surface water. Current risks for restricted use (excluding arsenic) are at the low end of the risk management range.	Toxicity, mobility, and volume would be reduced at the site upon excavation under Non-VOC4a and Non-VOC4b. Reduction by natural degradation processes only would occur under No Further Action, but could not be evaluated because no monitoring is included.	Short-term risks during excavation (Non-VOC4a and Non-VOC4b) could be managed. There are no short-term risks associated with No Further Action.	All evaluated alternatives are implementable. Excavation (Non-VOC4a and Non-VOC4b) within the creek may be difficult.	Non-VOC4a* = $1,052,000 Non-VOC4b* = $810,000

Notes: 1) Institutional controls alone would not directly address potential threats to groundwater; however, the threat to groundwater via VOCs is addressed under the VOC Groundwater ROD. Alternative VOC2 would not comply with ARARs for SVS sites, where risks for the industrial use scenario exceed (or potentially exceed) the upper end of the risk range.

* Indicates the costs and volumes for the alternative have been revised based on the completion of the SVS and Building 252 Radiological NTCRA.

AOC area of concern
ARAR applicable or relevant and appropriate requirements
CS confirmed site
HI Hazard Index
IC institutional control
IC (#) investigation cluster (used with a numeral to identify SVE investigation/cleanup areas)
PRL potential release location
PV_{30} Present value worth 30-year costs; no costs are associated with No Further Action alternative

SA	study area
SSG	shallow soil gas
SVE	soil vapor extraction
TPH	total petroleum hydrocarbons
TPH-D	diesel-range total petroleum hydrocarbons
TPH-G	gasoline-range total petroleum hydrocarbons
VOC	volatile organic compound

2.11 PRINCIPAL THREAT WASTES

Principal threat wastes are those hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination and are considered to be highly toxic or highly mobile, which generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable.

The contaminants at the FOSET # 2 Action Sites are not highly mobile and could be reliably contained; therefore, they do not constitute principal threat wastes.

2.12 SELECTED REMEDIES

EPA, in consultation with DTSC and the Central Valley Water Board, is selecting the combination of remedial alternatives as described below for the FOSET # 2 Action Sites. These remedial alternatives were presented in the Proposed Plan, and EPA has determined that the selected remedies are protective of human health and the environment, given the current and reasonably anticipated future land use of industrial or industrial/commercial. The selected IC measures are necessary to protect public health and the environment from the residual contaminants at the sites.

The selected remedies are presented in Table 1-2 and are presented in site-specific write-ups in Attachment D. Each of the selected remedies is described in detail in Sections 2.12.1 through 2.12.3. Because ICs and ECs are a component of most of the remedies, they are discussed in detail in Sections 2.12.4 and 2.12.5, respectively, following the remedy descriptions.

2.12.1 Alternative VOC2

Under Alternative VOC2, restrictions on residential/sensitive use will be used to eliminate or limit exposure pathways for VOCs to human receptors and the environment. Alternative VOC2 results in restricted land use. The use restrictions will be implemented through provisions in the property deeds and in SLUCs. The restrictions will prohibit the use of the sites for residential purposes, hospitals for human care, public or private schools for persons under 18 years of age, or day-care centers for children. Annual monitoring to determine if property use has conformed to the ICs and use restrictions is part of this alternative.

2.12.2 Alternative VOC3

In addition to the selected restrictions in Alternative VOC2, Alternative VOC3 includes ICs requiring either mitigation for vapor intrusion or sampling to show acceptable risk for any future construction or significant remodeling of existing buildings (e.g., remodeling that requires replacing major portions of the foundation or floor). Alternative VOC3 results in restricted land use. These ICs will be implemented through provisions in the property deeds and in SLUCs. Annual monitoring to determine if property use has conformed to the ICs or use restrictions is part of this alternative.

The restriction will prohibit construction or significant remodeling unless vapor controls are installed to mitigate the risk from vapor intrusion. Vapor controls are required unless new sampling indicates that SSG IC compliance levels in Table 2-5 are not exceeded, or a risk assessment based on new sampling is performed to evaluate the risk posed under CERCLA and the NCP, as determined by EPA, in consultation with DTSC and the Central Valley Water Board. The selection of the controls to be implemented will be based on whether the controls are to be implemented on an existing building or future construction. For existing buildings, the building design, foundation type (e.g., slab, raised, etc.),

and function of the building (e.g., warehouse, office building, etc.) will be used to determine the most appropriate type of EC in the approved work plan). For new buildings, a vapor barrier is assumed to be the most appropriate type of EC; however, this will ultimately be determined during the building design phase and approved by EPA, in consultation with DTSC and the Central Valley Water Board.

2.12.3 Alternatives Non-VOC4a and Non-VOC4b

Under Alternatives Non-VOC4a and Non-VOC4b, contaminated soil and/or sediment above the applicable cleanup levels in Table 2-3 will be excavated, and the excavated soil will be transported to an appropriate facility for disposal. Pre-excavation sampling may be conducted to refine the excavation area boundaries prior to construction work. Excavation will not be required in areas where validated pre-excavation sampling results are below cleanup levels. Alternative Non-VOC4a uses cleanup levels for restricted land use (i.e., industrial land use), and all soil containing concentrations of contaminants above industrial use cleanup levels (which could include cleanup levels for protection of surface water and groundwater) will be removed. Alternative Non-VOC4a also includes ECs (as appropriate for sites where potential impacts to surface water would remain), ICs, and annual monitoring to evaluate whether the ICs and ECs have been maintained.

If, based on the sampling for specific sites as identified in Attachment D during the Remedial Design phase, the average residual concentrations in the 0- to 1-foot-bgs interval exceed cleanup levels for protection of surface water, then a water quality assessment, ECs (e.g., maintaining the existing surface cover or sediment traps and quarterly monitoring), ICs (i.e., digging restrictions), additional excavation, and/or monitoring will be required to address potential impacts to surface water. If monitoring is required, it would be conducted over a period of at least three years or as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. ICs include use restrictions to prevent residential and sensitive use (e.g., hospitals, public or private schools for persons under 18 years of age, daycares, etc.), protection of surface covers or sediment traps, and digging restrictions to prevent soil disturbing activities (e.g. digging, excavation, grading, removal, trenching, filling, or other earth movement) that do not comply with the McClellan Park Soils Management Manual for Transfer Parcels that is in effect at the time of proposed soil or surface cover disturbing activities. The selected ICs will be implemented through provisions in the property deeds and in SLUCs. Table 2-7 displays the applicable ICs for each site. The most appropriate type of EC will be determined in the EPA/State-approved RAWP. Table 2-8 displays the applicable ECs for each site. Site-specific discussions of ECs required under Alternative Non-VOC4a are provided in Attachment D.

Alternative Non-VOC4b uses cleanup levels for unrestricted use. All soil containing concentrations of contaminants above unrestricted use cleanup levels (including cleanup levels for protection of surface water and groundwater) would be removed, and the resulting land use is unrestricted. Because resulting land use will be unrestricted, long-term ICs, ECs, and/or monitoring will not be required under Alternative Non-VOC4b.

Contaminated soil at concentrations exceeding cleanup levels will be physically excavated using conventional earthmoving equipment. The estimated extent of excavation for each site is shown on the site-specific figures in Attachment D and in Table 2-1. The type and quantity of equipment used will depend on the depth, areal extent, and volume of soil requiring removal. Field screening and/or onsite laboratory analysis might be used to guide excavation. Site controls such as fencing, signage, and security will be implemented as necessary during the remedial action. During excavation, stormwater runoff will be controlled using best management practices (e.g., staked straw waddles, silt fence curtains) to ensure that discharges of stormwater do not negatively impact surrounding surface water.

Following initial excavation, confirmation sampling will be conducted to verify that cleanup levels have been achieved. The details of this confirmation sampling, including sampling locations, sampling frequency, specific analytical methods, and acceptable confirmation sampling results, will be provided in the work plans associated with the Remedial Design phase of the project. If the analytical results indicate that contamination has been adequately removed, then the excavation void will be backfilled with clean soil. Otherwise, excavation will continue until cleanup levels are met. Verification sampling of the backfill, including sampling frequency, analytical methods, and acceptable results, will be provided in the work plan associated with the Remedial Design phase of this project. Backfill material used as cover soil (0 to 1 foot bgs) will be required to meet the screening levels for protection of surface water.

Construction activities associated with excavation have the potential to impact habitat, either directly or indirectly. The habitat impacts will require the payment of mitigation fees as compensation. Because the affected wetlands/vernal pools are located in areas planned for future industrial use, the wetlands/vernal pools will not be restored. Indirect impacts to wetlands are assumed to require mitigation if construction activities are within 50 feet of a wetland (CH2MHill, 2012). For excavation within 50 to 250 feet of a wetland, it is assumed that mitigation fees will not be required but additional controls (e.g., erosion controls) will be necessary to ensure nearby wetlands are not impacted (USFWS, 2010; CH2MHill, 2012).

Excavated material will be segregated to remove drums, containers, saturated wastes/sludges (i.e., wastes containing less than 50 percent solids), and other incompatible materials for disposal at an appropriate facility. The details of the characterization sampling that will be performed on this material and the proposed disposal or recycle facility options will be provided in the work plan associated with the Remedial Design phase of this project. Segregation and any preparation required for transportation offsite (e.g., overpacking of drums) will be performed in a dedicated area at each site during excavation. The segregation and preparation area will be engineered to ensure that all contaminated material is contained. The remaining material (presumably mostly soil) would be stockpiled.

2.12.4 Institutional Controls

ICs are a component of all the selected remedies, except the No Further Action Alternative and Alternative Non-VOC4b. The intent of the ICs is to limit or eliminate exposure pathways to humans by prohibiting certain uses of the property.

The selected use restrictions described in Table 2-7 will be implemented in the deeds of the property and in SLUCs recorded on the property, if they have not already been implemented as described below. The SLUCs run with the land and are binding on the current and future property owners. The SLUCs are enforceable by DTSC and the Central Valley Water Board, and by EPA as a third-party beneficiary.

The performance objectives for ICs are as follows:

- Prohibit the development and use of the property for residential housing, hospitals, public or private schools for persons under 18 years of age, and childcare facilities;

- Prohibit digging except in accordance with the approved McClellan Park Soils Management Manual for Transfer Parcels that is in effect at the time of proposed soil or surface cover disturbing activities; and

- Require construction of new buildings in a manner that would mitigate unacceptable risk through installation of vapor intrusion controls or install vapor intrusion controls in existing buildings that will be modified to mitigate unacceptable risk.

- Prevent removal of any surface cover that is part of the selected remedy, including but not limited to asphalt, pavement, gravel, building foundations, and landscaping, or if surface cover is removed, replacement of such surface cover with an equivalent cover, or installation and monitoring of sediment traps. Alternatively, sampling and risk assessment may be performed to determine if levels of COCs remain that exceed surface water quality protection levels, as listed in Table 2-4.

The site feature maps for each site in Attachment D show the remedy location and the associated IC compliance boundaries and buffers.

The selected ICs for each FOSET #2 Action Site are listed in Table 2-7, while the ECs and monitoring for each FOSET # 2 Action Site are listed in Table 2-8.

2.12.4.1 Existing ICs

Some ICs are already in place on the property because they were put in place at the time the property was transferred by the Air Force. Use restrictions described in the FOSET based on the existing conditions at the property were incorporated into the deeds for the transferred parcels. In addition, at the time of transfer, the new property owner, MBP, recorded SLUCs containing the same use restrictions. The existing restrictions specify that the property shall not be put to any of the following uses:

1) A residence, including any mobile home or factory built housing, used as residential human habitation;
2) A hospital for humans;
3) A public or private school for persons under 18 years of age;
4) A day care center for children;
5) Any use in a manner that causes the covering or disturbing of groundwater monitoring wells or that restricts access to groundwater monitoring wells;
6) Any use that includes construction of any well or extraction of groundwater for any purposes other than monitoring or treatment of groundwater or that would cause the surface application or injection of water or other fluids, unless approved by EPA, DTSC, and Central Valley Water Board;
7) Any use that would disturb or limit access to any equipment or systems associated with groundwater or soil vapor extraction remediation or monitoring;
8) Any use that would restrict investigation activities, remedial actions or long term maintenance and operations.

Furthermore, pursuant to the federal deed and SLUC, no activities at the FOSET # 2 Action Sites, except response actions pursuant to the AoC (EPA, 2013) or FFA Amendment (AFRPA, 2011a), shall disturb the soil unless conducted in accordance with the approved McClellan Park Soils Management Manual for Transfer Parcels that is in effect at the time of proposed soil or surface cover disturbing activities. Any soils brought to the surface as a result are required to be managed in accordance with all applicable provisions of state and federal law.

Following the implementation of the selected remedies, some or all of the use or activity restrictions may no longer be necessary to protect human health and the environment.

2.12.4.2 Selected ICs

The use restrictions selected in this ROD for each site are listed in Table 2-7.

Sensitive Use Restriction

For those sites at which the sensitive use restriction is selected, the SLUC and deed shall specify that the property shall not be put to any of the following uses:

1) A residence, including any mobile home or factory built housing, used as residential human habitation;
2) A hospital for humans;
3) A public or private school for persons under 18 years of age; and
4) A day care center for children.

Digging and Protection of Surface Cover Restriction

For those sites at which the digging and protection of surface cover restriction is selected, the SLUC and deed shall contain the following use restriction:

All soil disturbing activities (e.g., digging, excavation, grading, removal, trenching, filling, or other earth movement) and surface cover removal activities (e.g., removal of any surface cover that is part of the selected remedy, including but not limited to asphalt, pavement, gravel, building foundations, and landscaping) shall be prohibited, except those undertaken in accordance with the McClellan Park Soils Management Manual for Transfer Parcels that is in effect at the time of proposed soil or surface cover disturbing activities. Normal landscaping and lawn maintenance activities are excluded from this restriction.

Vapor Intrusion Restriction

For those sites at which the vapor intrusion restriction is selected, the SLUC and deed shall contain the following use restriction:

Any (i) new, enclosed structure on the property, or (ii) any modification to an existing enclosed structure on the property that disturbs the soil and/or building slab (e.g., digging, excavation, grading, removal, trenching, filling, or other earth movement), must be designed, constructed, or modified in a manner that would mitigate unacceptable risk from vapor intrusion (e.g., through installation of a vapor intrusion barrier, vapor collection system, and/or other appropriate EC), or the property user shall evaluate the potential for such unacceptable risk prior to the erection of any new enclosed structure (or modification to an existing structure as described above) in the same area, and include mitigation of the vapor intrusion in the design/construction of the structure prior to occupancy, if an unacceptable risk is posed (i.e., IC compliance levels are exceeded) as determined by DTSC and EPA. The property user shall provide any related reports evaluating risk from vapor intrusion to DTSC and EPA for this determination and must obtain prior written approval from DTSC and EPA for any ECs proposed.

Protection of Remedy Components Restriction

For all sites at which the protection of remedy components restriction is selected, the SLUC and deed shall include the following:

Any interference with the following is prohibited: existing infrastructure such as groundwater treatment systems, SVE systems, monitoring and extraction wells, and associated piping. Activities are prohibited that would inject, percolate, or allow infiltration of water/other fluids into the groundwater (e.g., construction or creation of any groundwater recharge area, percolation ponds, unlined surface impoundments, trenches, or irrigation) to the extent that the injection/infiltration of water/other fluids might affect groundwater flow direction or gradient. Normal watering to support landscaping is excluded from this restriction. For each site at which the existing use restrictions in the deed and SLUCs are consistent with the selected use restrictions, no additional action will be necessary to implement those ICs. For those sites at which the existing use restrictions are not consistent with the selected remedies the SLUCs and deeds will be modified to implement the selected use restrictions.

ICs shall be maintained until the concentration of hazardous substances in the soil and shallow soil gas are at concentrations that allow for unrestricted use and unlimited exposure, as listed in Tables 2-3, 2-4, and Table 2-5. The ICs will be monitored to ensure that they remain in place and are effective and will be further evaluated in the five year review for the sites. The existing SLUCs and a Memorandum of Agreement entered into by MBP and DTSC require MBP or the current owner to conduct annual inspections and submit inspection reports regarding the use restrictions. In addition, pursuant to the AoC, MBP will prepare an Institutional Controls Implementation and Assurance Plan that, once approved by EPA, in consultation with DTSC and the Water Board, will describe the process and requirements for any additional IC implementation pursuant to this ROD, and monitoring and enforcement processes for the ICs.

Table 2-7 Summary of Selected Institutional Controls

Site ID	Selected Institutional Controls			
	Sensitive Use Restriction	**Vapor Intrusion Restriction**	**Protection of Remedy Components Restriction**	**Digging and Protection of Surface Cover Restriction**
Alternative VOC2 – Institutional Controls (ICs) to Restrict Land Use and Alternative and Non-VOC4a – Excavation and Disposal and ICs to Restrict Land Use				
AOC G-3	x		x	x
AOC G-5	x		x	x
CS 040	x		x	x
CS B-005	x		x	x
CS S-024	x		x	x
CS T-016	x		x	x
CS T-047	x		x	x
PRL S-001	x		x	x
PRL S-006	x		x	x

Site ID	Selected Institutional Controls			
	Sensitive Use Restriction	**Vapor Intrusion Restriction**	**Protection of Remedy Components Restriction**	**Digging and Protection of Surface Cover Restriction**
PRL S-017	x		x	x
PRL S-019	x		x	x
PRL S-044	x		x	x
SA 100	x		x	x
Alternative VOC2 – Institutional Controls (ICs) to Restrict Land Use and Alternative and Non-VOC4b – Excavation and Disposal				
PRL S-043	x		x	--
PRL S-045	x		x	--
SA 004	x		x	--
Alternative VOC3 – Institutional Controls to Restrict Land Use and Engineered Controls to Mitigate Shallow Soil Gas Contamination and Alternative Non-VOC4a – Excavation and Disposal and ICs to Restrict Land Use				
AOC G-4	x	x	x	x
CS 038	x	x	x	x
CS S-007	x	x	x	x
CS S-026	x	x	x	x
CS T-020	x	x	x	x
CS T-057	x	x	x	x
PRL T-032	x	x	x	x
SA 066	x	x	x	x
SA 080	x	x	x	x
SA 097	x	x	x	x
SA 107	x	x	x	x

Site ID	Selected Institutional Controls			
	Sensitive Use Restriction	**Vapor Intrusion Restriction**	**Protection of Remedy Components Restriction**	**Digging and Protection of Surface Cover Restriction**
Alternative Non-VOC4a – Excavation and Disposal and ICs to Restrict Land Use				
CS T-012	x		x	x
CS T-017	x		x	x
CS T-021	x		x	x
CS T-030	x		x	x
CS T-036	x		x	x
PRL S-002	x		x	x
PRL S-018	x		x	x
PRL S-025	x		x	x
SA 045	x		x	x
SA 049	x		x	x
SA 060	x		x	x
SA 063	x		x	x
SA 096	x		x	x
Alternative Non-VOC4b – Excavation and Disposal (Unrestricted)				
PRL S-036	--	--	x	--
SA 055	--	--	x	--
SA 109 (F2)	--	--	x	--

Notes:
x Component to be implemented as necessary by MBP under this ROD.
-- Institutional Controls not applicable to the specified site.
AOC area of concern
CS confirmed site
IC institutional control
ID identification
PRL potential release location
SA study area
VOC volatile organic compound

2.12.5 Engineering Controls

ECs are a component of Alternatives VOC 3 and Non-VOC4a as indicated in Table 2-8. For Alternative VOC3, ECs include vapor barriers, gas collection, or ventilation. For Alternative Non-VOC4a, ECs may include maintaining surface cover and sediment traps or monitoring.

The performance objectives for ECs are as follows:

- Maintain the integrity of surface cover to protect surface water quality. Where there are no surface covers, trap sediment to protect surface water quality;

- Install and maintain vapor barriers or other vapor controls to protect workers under the industrial/commercial reuse scenario until concentrations are below the SSG IC compliance levels (Table 2-5).

Specific descriptions of the ECs are included in the sections below.

2.12.5.1 Vapor Barrier

Vapor barriers are impermeable membranes placed over contaminated soils that are specially designed to limit VOC exposure pathways to human and ecological receptors. Vapor barriers are made from various materials, which may include high-density polyethylene, polyvinyl chloride, chlorosulphonated polyethylene, neoprene, butyl rubber, and elasticized polyolefin. Vapor barriers can be applied as solid liners or sprayed on in liquid form. Spray-on vapor barriers consist of a rubberized asphalt emulsion that solidifies when exposed to ambient air. New building construction often requires the installation of a vapor barrier when the threat of soil gas infiltration exists. For new construction, the vapor barriers are applied beneath the building foundation. For retrofit of existing buildings with a slab-on-grade foundation, either the slab may be removed to allow for installation of the barrier and then reinstalled, or the vapor barrier may be applied directly to the slab, with the addition of a shallow slab cover for protection. Land use restrictions will be necessary at each site containing a vapor barrier to prevent damage to the barrier and the creation of exposure pathways.

2.12.5.2 Gas Collection

Gas collection systems consist of a network of perforated piping situated within a layer of permeable material (e.g., gravel) just below the foundation of a building. The piping is connected to a vent pipe that typically extends vertically up to a point at or slightly above the height of the building. VOCs emanating from contaminated soil beneath the building collect within the piping and are discharged to the atmosphere through the vent pipe. Gas collection systems are specifically designed to limit VOC intrusion into indoor air. The systems can operate passively where driven primarily by diffusion; VOCs collect within the piping and slowly dissipate to the atmosphere through the vent pipe. The systems can also be designed to operate actively, where a pump is used to create a vacuum within the piping that actively collects VOCs and forcibly discharges them to the atmosphere. Gas collection systems are typically installed at the time of new building construction; however, the retrofit of existing buildings may also be possible. Land use restrictions will be necessary at each site containing a gas collection system to prevent damage to the system and the creation of exposure pathways.

2.12.5.3 Ventilation

Ventilation systems use fans to dilute the air within a building. Ventilation systems can be designed and used to prevent or minimize the migration of VOCs into indoor air (i.e., positive pressure systems), and/or

to dilute VOCs within the indoor air. Positive pressure ventilation systems are designed to create and maintain pressure within the building at a level slightly higher than ambient. Fresh air is drawn from outside the building, filtered, and then circulated within the building. The higher pressure within the building forces air outward through openings in the building such as cracks in the foundation. The positive pressure and outward movement of air prevents or minimizes the potential for VOCs emanating from contaminated soil to enter the building. Positive pressure systems work most effectively in buildings that are typically sealed (e.g., office buildings) and do not have access points that are routinely left open (e.g., loading docks).

Negative pressure systems are designed to create a slight negative pressure within the building. Air is constantly withdrawn from the inside of the building and discharged to the outside. The constant air movement flushes the building and removes VOCs from indoor air. Negative pressure systems typically are more effective in buildings with multiple doors and windows that are routinely left open. Ventilation systems are routinely installed during new construction. Ventilation systems can also be installed or upgraded in existing buildings.

2.12.5.4 Surface Cover

Surface cover would consist of maintaining landscaping or existing hard surfaces such as concrete, asphalt, or building foundations to prevent direct contact with contaminated soil, or to prevent erosion and associated impacts to surface water. Surface cover must be maintained where contaminants remain at concentrations exceeding the levels for protection of water quality. If the existing surface cover is removed, sampling must be done to determine if a surface cover must be restored or if a sediment trap and sediment monitoring are required. This EC is implemented with the IC for protection of surface cover.

2.12.5.5 Sediment Collection

Sediment collection would use engineered methods to control and trap sediment where contaminants remain at concentrations in surface soil (0-1 foot bgs) that exceed the levels for protection of water quality. Sediment collection methods involve the installation of pre-fabricated sediment traps to collect sediment and prevent it from reaching sensitive surface water features such as creeks. Monitoring and maintaining the sediment traps are required.

Table 2-8 Summary of Selected Engineered Controls and Monitoring

Site ID	Surface Controls					Monitoring
	Vapor Barrier	Gas Collection	Ventilation	Maintain Existing Surface Cover	Sediment Traps and Collection	Surface Water and/or Sediment Trap Monitoring
Alternative VOC2 – Institutional Controls (ICs) to Restrict Land Use and Alternative Non-VOC4a – Excavation and Disposal and ICs to Restrict Land Use						
AOC G-3	--	--	--	*	--	--
AOC G-5	--	--	--	* [a]	* [a]	* [a]
CS 040	--	--	--	--	--	--
CS B-005	--	--	--	--	--	--
CS S-024	--	--	--	--	--	--
CS T-016	--	--	--	* [a]	* [a]	* [a]
CS T-047	--	--	--	*	--	--
PRL S-001	--	--	--	*	--	--
PRL S-006	--	--	--	--	--	--
PRL S-017	--	--	--	--	--	--
PRL S-019	--	--	--	--	--	--
PRL S-044	--	--	--	* [a]	* [a]	* [a]

Site ID	Surface Controls					Monitoring
	Vapor Barrier	Gas Collection	Ventilation	Maintain Existing Surface Cover	Sediment Traps and Collection	Surface Water and/or Sediment Trap Monitoring
SA 100	--	--	--	--	--	--
Alternative VOC2 – Institutional Controls (ICs) to Restrict Land Use and Alternative Non-VOC4b – Excavation and Disposal						
PRL S-043	--	--	--	--	--	--
PRL S-045	--	--	--	* [a]	* [a]	* [a]
SA 004	--	--	--	--	--	--
Alternative VOC3 – Institutional Controls (ICs) to Restrict Land Use and Engineered Controls (ECs) to Mitigate Shallow Soil Gas Contamination and Alternative Non-VOC4a – Excavation and Disposal and ICs to Restrict Land Use						
AOC G-4	x	x	x	--	--	--
CS 038	x	x	x	--	--	--
CS S-007	x	x	x	* [a]	* [a]	* [a]
CS S-026	x	x	x	--	--	--
CS T-020	x	x	x	* [a]	* [a]	* [a]
CS T-057	x	x	x	* [a]	* [a]	* [a]
PRL T-032	x	x	x	* [a]	* [a]	* [a]
SA 066	x	x	x	--	--	--

Site ID	Surface Controls					Monitoring
	Vapor Barrier	Gas Collection	Ventilation	Maintain Existing Surface Cover	Sediment Traps and Collection	Surface Water and/or Sediment Trap Monitoring
SA 080	x	x	x	* [a]	* [a]	* [a]
SA 097	x	x	x	* [a]	* [a]	* [a]
SA 107	x	x	x	* [a]	* [a]	* [a]
Alternative Non-VOC4a – Excavation and Disposal and ICs to Restrict Land Use						
CS T-012	--	--	--	--	--	--
CS T-017	--	--	--	*	--	--
CS T-021	--	--	--	--	--	--
CS T-030	--	--	--	--	--	--
CS T-036	--	--	--	--	--	--
PRL S-002	--	--	--	* [a]	* [a]	* [a]
PRL S-018	--	--	--	--	--	--
PRL S-025	--	--	--	* [a]	* [a]	* [a]
SA 045	--	--	--	--	--	--
SA 049	--	--	--	*	--	--
SA 060	--	--	--	*	--	--

Site ID	Surface Controls					Monitoring
	Vapor Barrier	Gas Collection	Ventilation	Maintain Existing Surface Cover	Sediment Traps and Collection	Surface Water and/or Sediment Trap Monitoring
SA 063	--	--	--	* [a]	* [a]	* [a]
SA 096	--	--	--	--	--	--
Alternative Non-VOC4b – Excavation and Disposal						
PRL S-036	--	--	--	--	--	--
SA 055	--	--	--	--	--	--
SA 109 (F2)	--	--	--	--	--	--

Notes:
[a] The existing surface cover(s) must be maintained and/or sediment traps and monitoring must be implemented.
x One or more components to be implemented to mitigate SSG contamination.
* Component to be implemented under this ROD.
-- Engineered Controls not applicable to the specified site.
AOC area of concern
CS confirmed site
EC engineered control
IC institutional control
ID identification
PRL potential release location
SA study area
VOC volatile organic compound

2.12.6 Summary of the Estimated Remedy Costs

The cost summary presented in Table 2-9 is based on information provided in the FSs, where complete cost details can be found (CH2MHill, 2010, 2011, and 2012) and RARs (CH2MHill, 2013). The information in this cost estimate summary table is based on the best available information regarding the anticipated scope of the selected remedial alternatives. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. Changes may be documented in the form of a memorandum in the Administrative Record file, an Explanation of Significant Difference, or a ROD amendment. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost. The estimated costs are based on the selected remedial alternatives for each of the FOSET # 2 Action Sites (Table 1-2) and the estimated remedy costs (Table 2-6).

Table 2-9 Summary of Estimated Selected Remedy Costs

Remedial Alternative	Total Cost (PW_{30}) ($)
Alternative VOC2	$1,232,000
Alternative VOC3	$2,073,000
Alternative Non-VOC4a	$18,798,600
Alternative Non-VOC4b	$1,675,000
Total Costs	$23,778,600

Notes: PW_{30} = present worth 30-year costs
A 3.0 percent discount rate, as per the United States Office of Management and Budget (OMB) Circular A-94 Appendix C (2012), was used for real discount rates over a 30-year period.

2.12.7 Summary of the Rationale for the Selected Remedies

EPA selected the remedies for the FOSET # 2 Action Sites based on the Air Force FSs (CH2MHill, 2010, 2011, and 2012). The principal factors considered in choosing the selected remedies for each site are summarized in the following sections. Site-specific rationale for remedy selection can be found in Attachment D.

Alternative VOC2 – Institutional Controls to Prohibit Residential Use (Restricted Land Use) and Alternative Non-VOC4a – Excavation/Disposal (Restricted Land Use) were selected for 13 of the FOSET # 2 Action Sites –AOC G-3, AOC G-5, CS 040, CS B-005, CS S-024, CS T-016, CS T-047, PRL S-001, PRL S-006, PRL S-017, PRL S-019, PRL S-044, and SA 100.

For these sites, Alternative VOC2 was chosen because ICs for VOCs in SSG are cost-effective and technically feasible solutions for sites with low-level or limited contamination. ICs limit exposure to contaminants remaining in place above unrestricted levels in SSG by prohibiting use by residents and other sensitive receptors (e.g., hospitals, day care centers, and public or private schools for persons under 18 years of age). ICs are easily implementable and effective in the short- and long-term as long as they are monitored and enforced. Because the future land use is expected to be industrial or industrial/commercial, ICs selected as the remedial alternative to prohibit residential use are protective of human health and the environment and comply with ARARs. Alternative Non-VOC4a was chosen because the soil risks are either greater than the risk management range for restricted use or because COC concentrations in soil exceed cleanup levels for the protection of surface water and/or groundwater. Excavation will remove soil contaminants to eliminate risk to future workers, is protective of water

quality, and is easily implementable and effective in the short- and long-term. ECs limit impacts to water quality. Both ICs and ECs are easily implementable and effective in the short- and long-term, as long as they are monitored and enforced. Non-VOC4a is preferable to Non-VOC4b because the use of this area is industrial and because there is uncertainty at some sites regarding the extent of contaminants (i.e., beneath buildings, etc.), and thus the cost to achieve unrestricted use cleanup levels under Alternative Non-VOC4b is more uncertain.

Alternative VOC2 – Institutional Controls to Prohibit Residential Use (Restricted Land Use) and Alternative Non- VOC4b – Excavation/Disposal (Unrestricted Land Use) were selected for three of the FOSET # 2 Action Sites – PRL S-043, PRL S-045, and SA 004.

For these sites, Alternative VOC2 was chosen because ICs for VOCs in SSG are cost-effective solutions for sites with low-level or limited contamination. ICs limit exposure to contaminants remaining in place above unrestricted use levels in SSG by prohibiting use by residents and other sensitive receptors (e.g., hospitals, day care centers, and public or private schools for persons under 18 years of age). ICs are easily implementable and effective in the short- and long-term, as long as they are monitored and enforced. Because the future land use is expected to be industrial or industrial/commercial, ICs selected as the remedial alternative to prohibit residential use are protective of human health and the environment and comply with ARARs. Alternative Non-VOC4b was chosen because the COC concentrations in soil exceed cleanup levels for protection of groundwater and/or surface water quality (Table 2-3) and unrestricted cleanup levels for soil can be achieved without uncertainty related to the extent of contaminants. Excavation will remove soil contaminants to eliminate risk from soil contaminants, is protective of water quality, and is easily implementable and effective in the short- and long-term. Although no use restrictions related to soil will be placed on these sites after implementation of the Non-VOC4b portion of the remedy, use restrictions related to soil gas will remain under Alternative VOC2.

Alternative VOC3 – Institutional Controls to Mitigate Shallow Soil Gas Contamination (Restricted Land Use) and Alternative Non- VOC4a – Excavation/Disposal (Restricted Land Use) were selected for 11 of the FOSET # 2 Action Sites – AOC G-4, CS 038, CS S-007, CS S-026, CS T-020, CS T-057, PRL T-032, SA 066, SA 080, SA 097, and SA 107.

For these sites, Alternative VOC3 was chosen because the SSG risks are greater than or within the risk management range for restricted use. Alternative VOC3 is protective because it ensures that the vapor inhalation pathway will not be complete for site users, as it requires mitigation for potential vapor intrusion from SSG for new construction. The landowner may choose to mitigate SSG through the use of ECs including vapor barriers, gas collection, and/or ventilation. Alternatively, prior to new construction, the landowner or developer is required to demonstrate there is not an unacceptable risk under the restricted use scenario for a vapor intrusion pathway through sampling and analysis. ICs limit exposure to contaminants remaining in place above unrestricted levels in SSG by prohibiting use by residents and other sensitive receptors (e.g., hospitals, day care centers, and public or private schools for persons under 18 years of age), while ECs limit exposure for workers. Both ICs and ECs are easily implementable and effective in the short- and long-term, as long as they are monitored and enforced. Because the future land use is expected to be industrial or industrial/commercial, maintenance of the existing ICs as well as the implementation of ECs, as necessary, are protective of human health and the environment and comply with ARARs. SSG IC compliance levels for VOCs, above which ECs for mitigation are necessary, are presented in Table 2-5; they are protective of human health and the environment and comply with ARARS. Alternative Non-VOC4a was chosen either because the soil risks are greater than the risk management range for restricted use or because COC concentrations in soil exceed cleanup levels for protection of groundwater and/or surface water quality. Excavation will remove soil contaminants to eliminate risk to workers, is protective of water quality, and is easily implementable and effective in the short- and long-term. ECs limit impacts to water quality. Both ICs and ECs are easily implementable

and effective in the short- and long-term, as long as they are monitored and enforced. Non-VOC4a is preferable to Non-VOC4b because the use of this area is industrial and because there is uncertainty at some sites regarding the extent of contaminants (i.e., beneath buildings, etc.), and thus the cost to achieve unrestricted use cleanup levels under Alternative Non-VOC4b is more uncertain.

Alternative Non-VOC4a – Excavation/Disposal (Restricted Land Use) was selected for 13 of the FOSET # 2 Action Sites – CS T-012, CS T-017, CS T-030, CS T-021, CS T-036, PRL S-002, PRL S-018, PRL S-025, SA 045, SA 049, SA 060, SA 063, and SA 096.

Alternative Non-VOC4a was chosen because the soil risks are either greater than the risk management range for restricted use or because COC concentrations in soil exceed cleanup levels for protection of groundwater and/or surface water quality (Table 2-3). Excavation will remove soil contaminants to eliminate risk to workers, is protective of water quality, and is easily implementable and effective in the short- and long-term. ICs limit exposure to contaminants remaining in place above unrestricted levels by prohibiting use by residents and other sensitive receptors (e.g., hospitals, day care centers, and public or private schools for persons under 18 years of age), while ECs limit impacts to water quality. Both ICs and ECs are easily implementable and effective in the short- and long-term as long as they are monitored and enforced. It is preferable to Alternative Non-VOC4b because the use of this area is industrial and because there is uncertainty at some sites regarding the extent of contaminants (i.e., beneath buildings, etc.) and thus the cost to achieve unrestricted use cleanup levels under Alternative Non-VOC4b is more uncertain.

Based on estimates of the vertical and lateral extent of contamination at the sites requiring excavation, approximately 66,020 cubic yards will be excavated and disposed from all of the FOSET # 2 Action Sites using Alternative Non-VOC4a. Because the future land use is expected to be industrial or industrial/commercial, maintenance of the existing ICs as well as the implementation of the excavation and disposal remedy are protective of human health and the environment and comply with ARARs.

Alternative Non-VOC4b – Excavation/Disposal (Unrestricted Land Use) was selected for three of the FOSET # 2 Action Sites – PRL S-036, SA 055, and SA 109 (F2).

Alternative Non-VOC4b was chosen because the COC concentrations in soil exceed cleanup levels for protection of groundwater and/or surface water quality and unrestricted cleanup levels for soil can be achieved without uncertainty related to the extent of contaminants. Excavation will remove soil contaminants to eliminate risk, is protective of water quality, and is easily implementable and effective in the short- and long-term.

Based on estimates of the vertical and lateral extent of contamination at the sites requiring excavation, approximately 7,260 cubic yards will be excavated and disposed from all of the FOSET # 2 Action Sites using Alternative Non-VOC4b.

2.12.8 Expected Outcomes

Following implementation of Alternatives VOC2 (ICs to Prohibit Residential Use) and VOC3 (ICs to Restrict Land Use and ECs to Mitigate SSG Contamination), the expected outcome would be a restriction on land use to industrial purposes only. SSG IC compliance levels apply to VOCs at sites where Alternative VOC3 is selected as part of the remedy. SSG IC compliance levels are used as the basis for the extent of IC compliance boundaries for SSG and are presented in Table 2-5. Under Alternative VOC3, mitigation for vapor intrusion or sampling to show acceptable risk for any future construction or significant remodeling of existing buildings would be required for any areas within the IC compliance boundaries, as well as the 100 foot buffer zone. Because anticipated future land use at these sites is

industrial in nature, the restrictions and limitations are consistent with the intended reuse. The property would be available for industrial reuse immediately upon implementation of the remedies selected in this ROD.

Following implementation of Alternative Non-VOC4a (Excavation and Disposal [Restricted Land Use]), all wastes exceeding industrial use cleanup levels (see Table 2-3) will have been removed, and the resulting risks would be acceptable for industrial reuse of the property. Potential threats to groundwater and surface water would also be mitigated. If, based on the sampling for specific sites as identified in Attachment D during the Remedial Design phase, the average residual concentrations in the 0- to 1-foot-bgs interval exceed cleanup levels for protection of surface water, then a water quality assessment, ECs, additional excavation, and/or monitoring would be required to address potential impacts to surface water. If monitoring is required, it would be conducted over a period of at least three years. The expected outcome would be a restriction on land use to industrial purposes only. Additional limitations on intrusive activities without regulatory agency approval and/or ECs to address potential impacts to surface water would be required at some sites (Table 2-8). Because anticipated future land use at these sites is industrial in nature, the restrictions and limitations are consistent with the intended reuse. Industrial or commercial use of the property could be achieved within 6 months to a year.

Following implementation of Alternative Non-VOC4b (Excavation and Disposal [Unrestricted Land Use]), all wastes exceeding unrestricted use cleanup levels (see Table 2-3) will have been removed, and the resulting risks would be acceptable for unrestricted reuse of the property. Potential threats to groundwater and surface water would also be mitigated. The expected outcome would be unrestricted use of the property. Unrestricted use of the property could be achieved within 6 months to a year.

The first RAO (protection of human health, prevent inhalation, ingestion, direct contact, and external exposure to shallow soil gas and soil within the upper 15 feet bgs [with certain exceptions, as specified in Section 2.2.4] posing excess cancer risk greater than the CERCLA risk range [1 x 10-6 to 1 x 10-4] or an HI greater than 1) will be achieved if the concentration of each contaminant is less than or equal to cleanup levels presented in Section 2.8.3 for current and anticipated future land use. Cleanup levels are included for both unrestricted and industrial use and are generally based on a risk of 1 x 10-6 or an HQ of 1. In cases where concentrations still exceed the cleanup levels, ICs and ECs will be implemented, monitored, enforced, maintained, and reported on in order to prevent exposure and protect human health.

For non-VOCs, the second RAO (protect surface water and groundwater quality and beneficial uses from contaminants in soil and sediment) will achieve protection of groundwater if the concentration of each contaminant in soil is less than its respective cleanup level for protection of groundwater as presented in Section 2.8.3. For protection of surface water, the RAO is achieved if the concentration of each contaminant in soil is less than its respective cleanup levels for protection of surface water or if ECs eliminate contaminant migration. For VOCs, impacts to surface water are not expected because of the inherent volatility of VOCs. Impacts to groundwater from VOCs are not addressed in this ROD. Impacts to groundwater from VOCs below 15 ft bgs at several of the FOSET # 2 Action Sites are being addressed as part of the ongoing SVE program under the VOC Groundwater ROD (AFRPA, 2007).

For the third RAO (protect ecological receptors), land use at the FOSET # 2 Action Sites is currently, and is expected to remain into the foreseeable future, primarily industrial or industrial/commercial. There are limited areas with grassland and wetland/vernal pool habitat within and adjacent to some of the FOSET # 2 Action Sites. As described in Section 2.7.2, all of the FOSET # 2 Action Sites, except AOC G-5, have been determined not to pose significant risks to ecological receptors either onsite or in downgradient habitat or have already been evaluated as part of the Ecological Sites FS (CH2M HILL, 2010). For AOC G-5, this RAO will be achieved by eliminating the potential risks to benthic invertebrates from contaminants in soil and sediment through excavation and disposal of soil and sediment within seasonal

wetland 654 at AOC G-5 at concentrations exceeding restricted use cleanup levels. Because the affected wetland is located in an area planned for future industrial use, the wetland will not be restored. Mitigation (purchase of credits in a habitat mitigation bank or payment of mitigation fees as compensation) will be required for the impacted wetland. For the remaining FOSET # 2 Action Sites, this RAO will be achieved if direct or indirect impacts to wetlands/vernal pools from remedial activities (such as excavation) are prevented or mitigated.

2.13 STATUTORY DETERMINATIONS

Under CERCLA §121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, and mobility of hazardous wastes as a principal element and a bias against disposal of untreated wastes. The selected site remedies do not satisfy the statutory preference for treatment as a principal element of the remedies because costs to achieve the same risk reduction using treatment are significantly higher. The response actions selected in this ROD are necessary to protect public health or the environment from actual or threatened releases of hazardous substances into the environment and from actual or threatened releases of pollutants.

The following sections provide a brief description of how (or if) the selected remedies satisfy the statutory requirements of CERCLA §121 and the Five-Year Review requirements.

2.13.1 Protection of Human Health and the Environment

The selected remedies will protect human health and the environment through a series of remedies, including excavating contaminated surface and subsurface soils within the upper 15 feet bgs (with certain exceptions, specified in Section 2.2.4), ICs and/or ECs selected to prevent human exposure to contaminants that exceed the health-based clean up levels or removal of sediments and subsurface soils that exceed cleanup levels for the protection of water quality. Where excavation has been selected, soil will be excavated and transported for disposal at an appropriate facility, further limiting human and environmental exposure. ICs implemented as part of the selected remedies will also protect human health and the environment by restricting site uses that would allow exposure to any residual contamination. The selected remedies will not pose unacceptable short-term risks or result in cross-media impacts.

Under Alternatives VOC2 and VOC3, ICs would provide protection of human health and the environment by limiting exposure to contaminants in SSG. Access restrictions and land use restrictions would be designed to prevent exposure.

Under Alternative Non-VOC4a, excavation and disposal of contaminated soil/sediment within the upper 15 feet bgs (with certain exceptions, specified in Section 2.2.4) at concentrations greater than industrial use cleanup levels would provide protection of human health and the environment by physically removing the contaminants from the site, eliminating direct exposure, and minimizing the potential for migration of contaminants to groundwater and surface water. Under Alternative Non-VOC4b, contaminated soil/sediment within the upper 15 feet bgs (with certain exceptions, specified in Section 2.2.4) at concentrations greater than unrestricted use cleanup levels would be removed, eliminating direct exposure, and minimizing the potential for migration of contaminants to groundwater and surface water. Alternative Non-VOC4b would be more protective than Alternative Non-VOC4a. Under Alternative Non-VOC4a, contamination would remain at the sites at levels acceptable for industrial use. Therefore,

ICs would be implemented to protect human health and, as appropriate, ECs and/or monitoring would be implemented to protect surface water.

2.13.2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Section 121(d) of CERCLA states that remedial actions on CERCLA sites must attain (or justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations that are determined to be ARARs. Applicable requirements are those cleanup standards, criteria, or limitations promulgated under federal or state law that specifically extend to the situation at a CERCLA site. Relevant and appropriate requirements are federal or state cleanup standards, requirements, criteria, or limitations that, while not "applicable" to a hazardous substance, action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those found at the site. The selected remedies will meet all federal or state standards, requirements, criteria or limitations that have been determined to be ARARs for the FOSET # 2 Action Sites contamination. These ARARS are presented in Attachment A.

California Regional Water Quality Control Board, Central Valley Region Position Regarding Resolution 92-49 as an ARAR for the FOSET #2 Action Sites ROD:

The Central Valley Water Board has identified State Water Resources Control Board Resolution No. 92-49 as an ARAR for several of the remedial actions being selected for certain sites in this ROD. The Water Board asserts that Resolution No. 92-49 is an applicable requirement for remedial actions that may impact waters of the state pursuant to Water Code Section 13050, "Waters of the state" means any surface water or ground water, including saline waters, within the boundaries of the state.

EPA disagrees with the Central Valley Water Board about the applicability of Resolution No. 92-49 for the remedial actions being selected in this ROD. However, there is no substantive dispute as to the selected remedies and cleanup levels for this cleanup action, and the Central Valley Water Board believes the selected remedies and cleanup levels set forth in the ROD substantively comply with Resolution No. 92-49. The Central Valley Water Board reserves any and all rights to assert Resolution No. 92-49 as an ARAR in any future ROD and without prejudice to its position, the Central Valley Water Board agrees to concur with this ROD.

EPA's Position Regarding Resolution 92-49 as an ARAR for the FOSET #2 Action Sites ROD:

In general, EPA does not believe Resolution 92-49 is a relevant and appropriate requirement when the remedial action only addresses soil. This has been EPA's legal opinion over many years and its longstanding practice in identifying ARARs for soil cleanups at both private and Federal Facility sites. EPA agrees there may be instances where a soils remedial action could directly impact groundwater and in such instances, certain substantive provisions of Resolution 92-49 may be an ARAR.

The FOSET #2 Action Sites ROD addresses only soil, with MBP undertaking the implementation of the ROD under an AoC. The Air Force has retained responsibility for "groundwater and existing contamination or other environmental conditions greater than 15 feet below ground surface" at the FOSET #2 Action Sites (designated as "retained conditions" in the Administrative Order on Consent). Although there are a number of sites addressed in this ROD that have groundwater contamination underneath, this contaminated groundwater is being addressed in the VOC Groundwater ROD, which was signed in 2007, and the Non-VOC ROD Amendment signed in 2009. If the soils remedial action required by the FOSET #2 Action Sites ROD fails to address the impacts to the groundwater, the Air Force VOC Groundwater ROD will address such impacts or, if necessary, the Air Force VOC Groundwater ROD can

be amended to address such impacts. In addition, EPA has provided language in the Declaration that describes the mechanisms to address soils contamination near the 15-foot horizon.

2.13.3 Use of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

EPA has selected remedies for the FOSET #2 Action Sites that are protective of human health and the environment, comply with federal and state ARARs for the remedial actions, and are cost-effective.

The selected remedies will remove much of the source materials that contribute substantially to the risks. The selected remedies do not use alternative treatment technologies because they are not appropriate for site circumstances. The selected remedies satisfy the criteria for long-term effectiveness by removing PCBs, TPHs, PAHs, pesticides, and metals from the site. Offsite disposal of contaminated soil effectively reduces the mobility of chemicals and potential for direct contact.

2.13.4 Preference for Treatment as a Principal Element

The selected site remedies do not satisfy the statutory preference for treatment as a principal element of the remedies because costs to achieve the same risk reduction using treatment are significantly higher. The hazardous substances present at the FOSET #2 Action Sites are not considered principal threat wastes and, therefore, do not trigger the NCP expectation for treatment of principal threat wastes. For example, there are no liquid, mobile, or highly toxic source materials present at the FOSET #2 Action Sites.

For VOCs in shallow soil gas, treatment is not practicable to address the indoor air pathway. SVE was evaluated in the FSs as a treatment option (Alternative VOC4); however, given the relatively low and distributed concentrations of SSG, SVE is not technically feasible and was therefore screened out. There are no liquid, highly mobile, or highly toxic source materials that would require treatment. Treatment of excavated soil prior to disposal is not expected to be necessary; however, need for treatment cannot be determined until excavation occurs and the removed soil is characterized for disposal.

2.13.5 Requirements for Five-Year Reviews

Because these remedies result in hazardous substances, pollutants, or contaminants remaining on the site above levels that allow for unlimited use and unrestricted exposure, a statutory five-year review will be conducted for the FOSET # 2 Action Sites. For Alternative Non-VOC4b, a single five-year review report may be required to document completion of the remedy and additional five-year reviews may be required if the remedy cannot be completed within the first five years.

The Air Force will consolidate the protectiveness determinations for the remedies at the FOSET # 2 Action Sites in subsequent Five-Year Reviews. The next Five-Year Review will occur in 2019 in coordination with Five-Year Reviews being conducted by the Air Force and every 5 years thereafter to ensure that the remedies are, or will be, protective of human health and the environment.

2.13.6 Cost Effectiveness

In EPA's judgment, the selected remedies for the FOSET # 2 Action Sites are cost-effective. According to the NCP, a remedy is cost-effective if its costs are proportional to its overall effectiveness. The overall effectiveness of the selected remedies was demonstrated in the comparative analysis of the alternatives. The selected remedies satisfy the threshold criteria (overall protectiveness and compliance with ARARs), while scoring high with respect to long-term effectiveness and short-term effectiveness.

The overall effectiveness of the alternatives was then evaluated with respect to cost. Alternative VOC2 includes limited additional costs to modify the land use restrictions in the federal deed and SLUC and is, therefore, a cost-effective remedy. Alternative VOC3 incurs limited costs, other than for maintenance, inspection, reporting and possible enforcement of the ICs, and for any potential future sampling or ECs necessary to address risks of vapor intrusion. Costs for Alternatives Non-VOC4a and Non-VOC4b are required to protect public health and the environment. Therefore, these remedies are also considered cost-effective for these sites relative to the necessary remedial action.

2.13.7 State Acceptance

The DTSC and Central Valley Water Board have been an integral part of the CERCLA process for the FOSET # 2 Action Sites including the 2014 Proposed Plan and drafting this ROD. They concur on the selected remedies for the FOSET # 2 Action Sites.

2.13.8 Community Acceptance

The EPA issued a final Proposed Plan (EPA, 2014) for the FOSET # 2 Action Sites on January 2, 2014 for public comment. The public comment period on the Proposed Plan was held from January 6 to February 7, 2014 and a public meeting was held on January 21, 2014. All those who provided comments supported the FOSET # 2 Action Sites cleanup. Responses to all comments received are presented in Section 3.0.

2.14 DOCUMENTATION OF SIGNIFICANT CHANGES

The following changes have occurred subsequent to the Proposed Plan that was released for public comment in January 2014.

- The Proposed Plan listed Alternative Non-VOC4b as the selected remedy for CS T-030 and PRL S-018. However, while Alternative Non-VOC4b was implemented to address the radiological contamination at these sites, the chemical contaminants in soil should be addressed under Alternative Non-VOC4a, due to the intended future industrial use of the site. Therefore, Alternative Non-VOC4a was selected for CS T-030 and PRL S-018 in this ROD.

- The costs and volumes for sites CS B-005, CS 040/PRL S-006/PRL S-019, CS T-030/PRL S-018, and SA 109 were revised based on completion of the SVS and Building 252 Radiological NTCRAs listed in Attachment B. Excavations conducted during the SVS and Building 252 Radiological NTCRA have impacted the volume and costs associated with the Non-VOC remedies for these sites.

- PAHs were added as a COC for CS T-030 based on the SVS and Building 252 Radiological NTCRA. During the SVS and Building 252 Radiological NTCRAs, the tanks were found to contain product and when the tanks were removed one sample location had PAHs. The extent of PAHs has not been delineated.

- The Proposed Plan listed Alternatives VOC3 and Non-VOC4b as the selected remedies for CS T-020; however, ECs are needed to address TPH at the surface in the vicinity of sample CST20SB007 to protect surface water. Therefore, Alternatives VOC3 and Non-VOC4a were selected for CS T-020 in this ROD.

3.0 PART 3: RESPONSIVENESS SUMMARY

EPA received one verbal comment during the public meeting. The comment and the EPA response are provided below. There were no written comments received during the public comment period.

3.1 STAKEHOLDER COMMENTS AND LEAD AGENCY RESPONSES

Mr. Glenn Jorgensen, Restoration Advisory Board: *In my time with the McClellan Restoration Advisory Board, I have been impressed with the care that both the Air Force and the regulatory agencies and the EPA and the -- no, there's a local water board. Yeah, that's it. I can never remember it. But anyway, the care they take in seeing that these remedial actions are appropriate, and which is why I was curious about the difference in price because that doesn't follow. They don't do that. But I just wanted to say that I'm -- I'm confident that -- that this -- that this -- that these proposed actions will be appropriate. Although I have to admit I'm going to look at them just to make sure. Thank you.*

EPA Response: The issue is why, if the estimated cost for an unrestricted use cleanup (Non-VOC4b) at sites CS T-012 / CS T-021, CS T-017, and CS T-036 is less than the industrial use cleanup (Non-VOC4a), EPA is proposing the Non-VOC4a cleanup for these sites.

As discussed with the commenter after the public meeting, these sites are most likely unique in that the estimated volumes to be excavated would be similar or the same for either industrial or unrestricted use and the explanation for the higher cost of the Non-VOC4a (industrial use) remedy is the cost of implementing institutional controls (ICs), which are required for sites with industrial use restrictions. Since ICs are implemented on a larger, parcel-wide basis rather than a site-wide basis, it is likely that there would be no actual cost difference if the sites were on the same parcel as another site or sites which require ICs.

EPA researched these sites further and confirmed that the estimated excavation volumes are indeed the same for both Non-VOC4a and Non-VOC4b remedies at each site, which explains why the site-specific estimated cost is higher for Non-VOC4a, which includes ICs. Furthermore, it was also confirmed that all the sites included in the question are on parcels which will have ICs due to required remedies for other sites, so there would be no actual cost difference.

Therefore, EPA is selecting the industrial use remedy (Non-VOC4a), since the intended reuse of the site property is industrial. In addition, there is some concern remaining after the Air Force Remedial Investigation / Feasibility Study that the actual excavation volumes that would be required for unrestricted use at these sites may be significantly larger than estimated.

3.2 TECHNICAL AND LEGAL ISSUES

There are no significant technical changes to the selected remedy. There are no additional significant technical or legal issues.

4.0 REFERENCES

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5.0 GLOSSARY/ACRONYMS

Administrative Record—A collection of all the pertinent documents that support the final decisions for each site. This is located at the former McClellan Air Force Base and at EPA, Region IX.

Air Force Civil Engineer Center (AFCEC or AFCEC/CIBW) —An Air Force unit responsible for real property management and environmental compliance and restoration, among other things. Includes the former Air Force Real Property Agency (AFRPA).

Air Force Real Property Agency (AFRPA)—A former field operating agency activated by the secretary of the Air Force. The mission was to execute the environmental programs and real and personal property disposal for major Air Force bases being closed in the U.S. Incorporated into AFCEC in October 2012.

Applicable or relevant and appropriate requirements (ARARs)— Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

Area of Concern (AOC)—An area identified for further investigation during the Installation Restoration Program process.

Cleanup levels—Levels set for the protection of human health, groundwater, or surface water. To protect human health, the set risk level is usually one in a million—an additional person in a million people may contract cancer.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)— Legislation passed in 1980 and designed to respond to the past disposal of hazardous substances. The act was extensively amended in 1986 by the Superfund Amendments and Reauthorization Act, which added many provisions and clarified unclear areas in the original law.

Confirmed Site (CS)—Site identified during the Installation Restoration Program process to have contaminants above the screening levels being used at the time.

Contaminant of concern (COC)—A substance selected for environmental cleanup based on predicted impacts to groundwater resources and a health risk posed by the contaminant.

Engineered Controls (ECs)—Methods of managing environmental and health risks. Engineered controls, such as barriers placed between a contaminated area and the rest of a site, can be used to limit exposure pathways.

Exposure pathway—Ways that people can be exposed to contaminants. Common pathways include breathing, ingestion, or absorption through the skin.

Feasibility Study (FS)—A study of a hazardous waste site that must be completed before a cleanup remedy can be chosen and implemented. The Feasibility Study identifies and evaluates alternatives for addressing contamination.

Five-year review—Regular check-ups conducted on certain Superfund sites (where either treatment systems are still operating after 5 years or where waste is left behind) to make sure the site is still safe. Five-year review reports make recommendations on the continuation, modification, or

elimination of annual reports and institutional control monitoring frequencies. Five-year reviews also represent an opportunity for the public to voice any concerns.

Groundwater—Underground water that fills pores between particles of soil, sand, and gravel or openings in rocks to the point of saturation. Where groundwater occurs in significant quantity, it can be used as a source of drinking water.

Hazard index (HI)—The ratio of contaminant concentration divided by the safe exposure level. If the hazard index exceeds 1, people are exposed to contaminants that may pose non-cancer health risks. Non-cancer health risks are contaminant-dependent but may include kidney disease, headaches, dizziness, and anemia. For more information, go to ToxFAQs at http://www.atsdr.cdc.gov/.

Industrial Use—When land is used for industrial, commercial, office, retail, or other occupational purposes.

Installation Restoration Program (IRP)—Program designed to identify, investigate, and cleanup contamination.

Mitigate—The implementation of engineered controls or actions that prevent or make conditions less severe or harsh.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP)—The federal regulation that guides determination of the sites to be cleaned up under the Superfund program. This plan also provides the organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances in accordance with CERCLA and the Clean Water Act.

National Priorities List (NPL)—The U.S. Environmental Protection Agency's published list of the highest priority hazardous waste sites in the U.S. for investigation and cleanup, which are subject to the Superfund program.

Non-cancer health risk—Health risks that do not result in cancer and may include kidney disease, headaches, dizziness, and anemia.

Non-volatile organic compounds (non-VOCs)—A group of compounds that do not readily evaporate at room temperature. They include metals, pesticides, SVOCs, petroleum hydrocarbons, dioxins/furans and radionuclides.

Occupational Worker—Includes indoor and outdoor workers who may be exposed to chemicals in soil, air, and water during the course of a workday.

Operable Unit (OU)—The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with a site. Operable units may address geographic portions of a site, specific site problems, or initial phases of an action, or may consist of any set of actions that are concurrent but located in different parts of a site. The determination of an operable unit may vary over time as a result of change in activity or need. For management purposes, McClellan is subdivided into 11 operable units. Ten operable units correspond to discrete areas of the base where specific industrial operations and/or waste management activities took place: A, B, B1, C, C1, D, E, F, G, and H. The remaining operable unit is the Groundwater OU, which encompasses the entire base.

Polychlorinated Biphenyls (PCBs)—A group of man-made compounds that were widely used, mainly in electrical equipment, but were banned at the end of the 1970s in many countries because of environmental concerns.

Polycyclic aromatic hydrocarbons (PAHs)—Any of a class of carcinogenic organic molecules that consist of three or more benzene rings.

Potential Release Location (PRL)—A Site identified during the Installation Restoration Program process to have potentially released contaminants.

Preferred Alternative—EPA's suggested cleanup method(s) for the contaminated site(s). The preferred alternative is protective of human health and the environment, complies with applicable or relevant and appropriate requirements, and is cost-effective.

Preliminary Cleanup Goal (PCG)—A preliminary cleanup value used in the FS to evaluate alternatives and establish target volumes for excavation. This term is replaced by the term "cleanup level" in the ROD. The term PCG will appear in the legend of the figures in Attachment D, which were taken from the FSs documents.

Privatization—The process where the Department of Defense provides cleanup funds to a new property owner with the goal of speeding up redevelopment. EPA, instead of the military in conjunction with EPA, will decide how the contamination will be cleaned up.

Proposed Plan—A summary of cleanup alternatives for a contaminated site, including a preferred alternative and the reasons for its selection. This step is the community's opportunity to review and comment on all cleanup alternatives under consideration. The responses to the comments are presented in the Record of Decision. All changes from the Proposed Plan are explained in the Record of Decision.

Radionuclides—Radioactive elements that may be naturally occurring or synthetic. There are hundreds of radionuclides, many of which are rarely encountered. People are much more likely to encounter a few that are used routinely for medical, military, or commercial purposes. Twelve radionuclides are most commonly found at Superfund sites, including cesium-137, radium, radon, and thorium.

Record of Decision (ROD)—A document explaining and legally committing the lead agency to the cleanup alternative(s) that will be used at a site. The Record of Decision is based on information and technical analyses generated during the Remedial Investigation, the Feasibility Study, and consideration of public comments and community concerns.

Remedial Investigation (RI)—A hazardous waste site study to examine the nature and extent of site contamination.

Residential Receptor—A resident (child or adult) who may be exposed to chemicals through soil, air, and water from indoor and outdoor exposure.

Residential Use—When land is suitable for use as housing or any other purpose.

Responsiveness Summary—The section within the Record of Decision that summarizes comments received from the public during the public comment period and the responses from the lead agency.

Restoration Advisory Board (RAB)—A board consisting primarily of members of the public. Board members have the opportunity to review cleanup reports and provide advice to decision makers on investigation and cleanup matters. The Restoration Advisory Board is a forum for the exchange of information between community members, regulatory agencies, and Air Force personnel.

Risk Assessment—A study based on the results of the Remedial Investigation to determine the extent to which chemical contaminants found at a Superfund site pose a risk to public health and the environment.

Semi-volatile organic compounds (SVOCs)—A group of chemical compounds that evaporate in air at a slower rate than VOCs. SVOC is a name for a class of compounds and includes PAHs, PCBs, pesticides, and dioxins/furans.

Shallow soil gas (SSG)—Soil gas in the upper 15 feet of soil.

State Land Use Covenant (SLUC)—A legal document that limits future land use.

Soil gas—The air between soil particles that may be contaminated by contaminants that have vaporized in the soil.

Soil Vapor Extraction (SVE)—A method of treating soil contaminants by extracting contaminated soil gas using perforated underground pipes connected to vacuum pumps.

Study Area (SA)—A site identified during the Installation Restoration Program process that requires further study for potential contamination.

Total petroleum hydrocarbons (TPH)—A wide range of liquid hydrocarbons, including gasoline and diesel fuel.

Unrestricted land use—A designation that risk is reduced to such a low level as to allow anything to be built, including homes and public or private schools for persons under 18 years of age.

Vapor inhalation pathway—A pathway used in risk analysis where contaminants in the soil volatilize into soil gas, migrate into buildings, and are inhaled by the occupants.

Volatile organic compound (VOC)—An organic compound containing carbon that evaporates (volatilizes) readily at room temperature. VOCs are used in the manufacturing of paints, pharmaceuticals, and refrigerants. VOCs typically are industrial solvents, such as trichloroethene (TCE). Some VOCs are known carcinogens. For more information, go to ToxFAQs at http://www.atsdr.cdc.gov/.

ATTACHMENT A.
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The ARARs listed below include provisions that could be triggered by activity associated with the selected remedy, although EPA does not expect or anticipate that a number of these provisions will be triggered. The list does not include provisions that would be triggered by a failure of the selected remedy. Those ARARs would be addressed in an amendment to the ROD.

Action-Specific ARARs

Source	Requirement/ Citation	ARAR Determination	Description of Requirement	Comments	Sites
Water Quality Control Plan (Basin Plan) for the Sacramento and San Joaquin River Basins	Chapter III, Water Quality Objectives for Inland Surface Waters	Applicable	The water quality objectives apply to all surface waters in the Sacramento and San Joaquin River Basins, including the Delta or as noted.	Any activity, including, for example, a new discharge of contaminated soils that may affect water quality must not result in water quality exceeding water quality objectives.	Non-VOC4b sites
Water Quality Control Plan (Basin Plan) for the Sacramento and San Joaquin River Basins	Narrative Toxicity Standard in the Water Quality Control Basin	Applicable	Chapter III, Narrative Toxicity Objective, states as a policy that all waters shall be maintained free of toxic substances that produce detrimental physiological responses in human, plant, animal or aquatic life.	The narrative toxicity objective is a federally required water quality objective for surface waters.	Non-VOC4b sites
Clean Water Act – National Pollutant Discharge Elimination System (NPDES) Program	California Toxics Rule (CTR) 40 Code of Federal Regulations (CFR) Part 131	Applicable	Water quality standards: EPA adopted water quality criteria that apply in California, called the California Toxics Rule (CTR). The CTR establishes water quality standards that apply to NPDES discharges when certain conditions are met.	The CTR is an ARAR for the sites that pose a threat to surface water quality. The CTR establishes criteria for surface water quality.	Non-VOC4b sites
Discharges of Storm Water from Construction Areas	40 CFR Parts 122, 123, 124, NPDES, implemented by California Storm Water Permit for Construction Activities, State Water Resources Control Board Order 2010-0014-DWQ	Applicable	Regulates pollutants in discharge of storm water associated with construction activity (clearing, grading, or excavation) involving the disturbance of 1 acre or more. Requirements to ensure storm water discharges do not contribute to a violation of surface water quality standards.	Substantive requirements relating to potential discharge of pollutants to Waters of the United States from cleanup and remedial action activities. Applies to construction areas over 1 acre in size. Includes measures to minimize and/or eliminate pollutants in storm water discharges and monitoring to demonstrate compliance	All sites
Discharges of Storm Water from Industrial Areas	40 CFR Parts 122, 123, 124, NPDES, implemented by California Storm Water Permit for Industrial Activities, SWRCB Order 97-03-DWQ	Applicable	Regulates pollutants in discharge of storm water associated with hazardous waste treatment, storage, and disposal facilities, wastewater treatment plants, landfills, land application sites, and open dumps. Requirements to ensure storm water discharges do not contribute to a violation of surface water quality standards.	The CERCLA permit exemption applies to all discharges that are related to response actions and that are “onsite,” as that term is defined in the NCP. Remedial activities should meet the substantive requirements of the NPDES Program.	All sites

Source	Requirement/ Citation	ARAR Determination	Description of Requirement	Comments	Sites
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13269).	Title 23, California Code of Regulations (CCR), Section 2520, 2521	Applicable	Action taken by public agencies to cleanup unauthorized releases are exempt from Title 27/ Title 23 except that wastes removed from immediate place of release and discharged to land must be managed in accordance with classification (Title 27 CCR, Section 20200/ Title 23 CCR, Sections 2520) and siting requirements of Title 27 or Title 23 and wastes contained or left in place must comply with Title 27 or Title 23 to the extent feasible. Requires that waste be sent to the appropriate waste management unit, depending on its classification.	Applies to discharges of waste to land for treatment, storage or disposal.	All Sites
Remediation and Monitoring of Sites	Title 27, CCR, Section 20090(d) Title 23 CCR, Section 2511(d)	Applicable		Applies if there is designated waste on site and if hazardous waste is present. Applies to remediation and monitoring of sites. Before action, waste must be classified and disposed of consistent with its classification.	All Sites
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304).	Title 27, CCR, Section 20080 (d) Title 23, CCR, Section 2510(d)	Relevant and Appropriate	Requires closure of existing waste management units according to Title 27/Title 23.	Applies to “existing” waste management units (i.e., areas where waste was discharged to land on or before November 27, 1984, but that were not closed, abandoned, or inactive prior to that date).	All Sites
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13269).	Title 27, CCR Section 20200(c), 20210	Applicable	Requires that designated waste be sent to Class I or Class II waste management units.	Applies to discharges of designated waste (nonhazardous waste that could cause degradation of surface or ground waters) to land for treatment, storage, or disposal.	All Sites
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13269).	Title 27, CCR Section 20200(c), 20220	Applicable	Requires that nonhazardous solid waste be sent to an appropriate waste management unit.	Applies to discharges of nonhazardous solid waste to land for treatment, storage, or disposal.	All Sites
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13269).	Title 27, CCR, Section 20410 Title 23, CCR, Section 2550.6	Relevant and Appropriate*	Requires monitoring for compliance with remedial action objectives for three years from the date of achieving cleanup levels.	Post remediation sediment trap monitoring shall be conducted to demonstrate that the source of contamination has been eliminated and to assure protection of surface water quality.	All Sites
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13269).	Title 27, CCR Section 20950 (a)(2)(B)	Relevant and Appropriate*	(2) Performance Standards -The performance standards applicable to closure of a Unit and, for Units that are not clean-closed, to post-closure maintenance at the Unit are as follows: (B) Unit Clean-Closed — for Units that are clean-closed, the goal of closure is to physically remove all waste and contaminated materials from the Unit and from its underlying and surrounding environs, such that the waste in the Unit no longer poses a threat to water quality. Successful completion of clean-closure eliminates the need for any post-closure maintenance period and removes the Unit from being subject to the SWRCB-promulgated requirements of this subdivision.	Applicable to excavated soil to determine partial or final closure of waste management units.	All Sites

Source	Requirement/ Citation	ARAR Determination	Description of Requirement	Comments	Sites
Land Use Covenant	California Civil Code Section 1471	Relevant and Appropriate	Allows an owner to enter into restrictive land use covenants as "reasonably necessary to protect present or future human health or safety or the environment as a result of the presence on the land of hazardous materials…" 1471(a)(3)	This language provides authority for establishing a durable IC that will be implemented through incorporation of restrictive covenants that run with the land.	VOC2, VOC3, and Non-VOC4a sites
Land Use Covenants	Title 22, CCR Section 67391.1	Relevant and Appropriate	Requires that a land use covenant imposing appropriate limitations on land use shall be executed and recorded when hazardous substances will remain at the property at levels not suitable for unrestricted use of the land.	EPA specifically identifies subsections (a) and (d) as relevant and appropriate for this ROD. DTSC's position is that all of the State regulation is an ARAR.	VOC2, VOC3, and Non-VOC4a sites
Hazardous Waste Determination	Title 22, CCR Section 66262.11	Applicable	Defines the methods to be used to determine whether a waste is a hazardous waste.		All Sites
Criteria for Identifying Hazardous Waste and Persistent and Bio-accumulative Toxic Substances	Title 22, CCR Ch. 11, § 66261.24	Applicable	Presents criteria for testing and identifying RCRA hazardous wastes, sets levels for total threshold limit concentrations (TTLC) and soluble threshold limit concentrations (STLC).	The criteria and TTLC and STLC levels are applicable for the characterization of excavated soils or other wastes generated by remedial actions.	Non-VOC4a and Non-VOC4b sites
Standards Applicable to Generators of Hazardous Waste	Title 22, CCR Sections 66262.10 and 66262.11	Applicable	Establishes standards for generators of hazardous wastes in California, including those for hazardous waste determination.	Substantive requirements are applicable to management of excavated soils or treatment residuals if they exceed RCRA hazardous waste thresholds.	Non-VOC4a and Non-VOC4b sites
Use and Management of Containers	Title 22, CCR Sections 66264.171, 66264.172, 66264.173, 66264,174, 66264.175(a) and (b), 66264.177, and 66264.178	Applicable	These regulations define the requirements for using and managing containers, including compatibility between wastes and containers, storage of containers, inspections for leakage/deterioration, containment of container transfer/storage areas, incompatible wastes, and containment system closure.	Applicable to sites where containers will be used for temporary storage or excavated soil / remediation units.	Non-VOC4a and Non-VOC4b sites
Land Disposal Restrictions	Title 22, CCR Section 66268.124, Corrective Management Rule, §§ 66264.91; 66262.100, 66264.708; 66270.30; and 66272.1	Applicable	Identifies hazardous wastes that are restricted from land disposal.	If excavated soil or treatment residuals exceed limits they will be evaluated using TTLC/STLC to determine if treatment is required prior to off-site disposal.	Non-VOC4a and Non-VOC4b sites
Pre-transportation Handling of Hazardous Waste	Title 22, CCR Sections 66262.30, 66262.31, 66262.32, 66262.33, and 66262.34	Applicable	Defines pre-transport requirements for RCRA or California hazardous waste, including packaging, labeling, marking, placarding, and accumulation time limitations.	Applicable to RCRA or California hazardous waste that may be shipped offsite for disposal.	Non-VOC4a and Non-VOC4b sites
Control of Air Emissions	Rule 403, Fugitive Dusts	Applicable	Limits visible particulate emissions to the property line.	Would be applicable for soil excavation and handling	Non-VOC4a and Non-VOC4b sites

Source	Requirement/ Citation	ARAR Determination	Description of Requirement	Comments	Sites
Toxic Substances Control Act (TSCA)	40 CFR Parts 761.60-761.79	Relevant and Appropriate	Regulates PCB-contaminated material.	TSCA provides requirements for sampling, characterization and cleanup of PCB contaminated soils, including the management of excavated material and off-site disposal requirements.	PCB Sites: AOC G-5 CS 040 CS S-024 PRL S-002 PRL S-006 PRL S-019 PRL S-025 PRL S-036 SA 004 SA 049 SA 055 SA 063 SA 097 SA 109 (F2)

* The State disagrees with EPA's characterization of these requirements as "relevant and appropriate" as by statute and regulation they apply expressly to the circumstances at the site. The State, however, does not object to the ROD because the State concurs with the selected remedies, and when the ROD is final the performance standards of these ARARs will become the enforceable requirements for the remedial action.

ATTACHMENT B. PAST FOSET # 2 ACTION SITES REMOVAL ACTIONS

Summary of Radiological Removal Actions

Site	Removal Descriptions	Status
CS 040	• SVS and Building 252 Radiological NTCRA conducted between July 2012 and June 2013, in conjunction with PRL S-006; • Resulted in residual Ra-226 concentrations suitable for unrestricted use of the site with respect to radionuclides, using a cleanup level of 2.0 pCi/g; • A total of 7,460 cubic yards of contaminated soil were removed, greatly exceeding the 180 cubic yards estimated.	Complete for Ra-226
CS B-005	• SVS and Building 252 Radiological NTCRA conducted between June 2012 and June 2013; • Resulted in residual Ra-226 concentrations suitable for unrestricted use of the site with respect to radionuclides, using a cleanup level of 2.0 pCi/g; • Removed non-VOC contaminants co-located with radium 226 in soil; • A total of 7,325 cubic yards of contaminated soil and asphalt were removed, exceeding the 5,610 cubic yards estimated.	Complete for Ra -226, but confirmation sampling for dioxins and furans was insufficient to determine whether further excavation is necessary.
CS T-030	• SVS and Building 252 radiological NTCRA conducted between October 2012 and June 2013; • Resulted in residual Ra-226 concentrations suitable for unrestricted use of the site with respect to radionuclides, using a cleanup level of 2.0 pCi/g; • A total of 3,132 cubic yards of contaminated soil, asphalt, and concrete were removed, which is less than the 5,037 cubic yards estimated; • Removed non-VOC contaminants co-located with radium 226 in soil; • Included removal of four USTs (tanks 1, 2, 5, and 6) and solvent lines beneath Building 252 as well as demolition of Buildings 252, 253, and 230.	Complete for Ra-226, but additional sampling is needed to evaluate the extent of PAHs and determine whether additional excavation is necessary.
PRL S-006	• SVS and Building 252 Radiological NTCRA conducted in July 2012, in conjunction with CS 040; • Resulted in residual Ra-226 concentrations suitable for unrestricted use of the site with respect to radionuclides, using a cleanup level of 2.0 pCi/g; • A total of 92 cubic yards of contaminated soil were removed, exceeding the 50 cubic yards estimated.	Complete for Ra-226

PRL S-018	• SVS and Building 252 Radiological NTCRA conducted between October 2012 and June 2013; • Resulted in residual Ra-226 concentrations suitable for unrestricted use of the site with respect to radionuclides, using a cleanup level of 2.0 pCi/g; • A total of 3,132 cubic yards of contaminated soil, asphalt, and concrete were removed, which is less than the 5,037 cubic yards estimated; • Removed non-VOC contaminants co-located with radium 226 in soil; • Included removal of four USTs (tanks 1, 2, 5, and 6) and solvent lines beneath Building 252 as well as demolition of Buildings 252, 253, and 230.	Complete for Ra-226, but the extent of mercury contamination has not been delineated and confirmation sampling for mercury and PAHs was insufficient. Additional sampling for mercury and PAHs is needed to evaluate whether additional excavation is necessary.
SA 109	• SVS and Building 252 Radiological NTCRA conducted between June 2012 and February 2013; • Resulted in residual Ra-226 concentrations suitable for unrestricted use of the site with respect to radionuclides, using a cleanup level of 2.0 pCi/g; • Removed non-VOC contaminants co-located with radium 226 in soil; • A total of 16,160 bank cubic yards of soil/sediment, metal liner, and gunite/shotcrete were removed, exceeding the 10,540 bank cubic yards of soil and 2,020 bank cubic yards of gunite/shotcrete estimated.	Complete for Ra-226, but sampling is needed to evaluate the extent of dieldrin and determine whether additional excavation is needed.

Notes:
CS confirmed site
NTCRA non-time critical removal action
PAHs polycyclic aromatic hydrocarbons
pCi/g picocurie(s) per gram
PRL potential release location
Ra-226 radium 226
SA study area
SVS Small Volume Sites
UST underground storage tank
VOC volatile organic compound

Sources: Small Volume Sites and Building 252 Non-Time Critical Removal Action Report (CH2MHill, 2013).

Summary of Underground Storage Tank and Oil and Water Separator Removal Actions

Site	Removal Descriptions	Status
CS 038	Two carbon removal solvent USTs abandoned in place. One solvent UST removed in 2009.	Closure requested.
CS B-005	Four diesel and gasoline USTs removed in 2011. These USTs and the associated refueling station are not considered part of the CSM as they were installed in 1991 in accordance with California regulations.	Active
CS T-016	Five fuel USTs removed in 1992.	Closure not yet granted.
CS T-017	Nine fuel USTs removed in 1989.	Closure not yet granted.
CS T-020	Seven fuel and solvent USTs removed in 1990.	Closure not yet granted.
CS T-021	Five fuel and solvent USTs removed in 1989.	Closure not yet granted.
CS T-030	Two USTs removed, four USTs abandoned in place. Note that the remaining four USTs were removed during the SVS and Building 252 Radiological NTCRA.	Closure not yet granted.
CS T-036	Solvent UST removed in 1989.	Closure granted.
CS T-047	Underground OWS removed in 1994.	Closure not yet granted.
CS T-057	Wastewater UST removed in 1988.	Closure not yet granted.
PRL S-017	Two fuel USTs removed in 1984 and 1988 or 1990. Former OWS north of Building 251, date of removal unknown.	No soil impacts detected. Closure not yet granted for USTs or OWS.
PRL T-032	Two USTs removed in 1987.	Closure granted in 1998.
SA 045	Diesel UST removed in 1988.	Closure not yet granted.
SA 049	Diesel UST removed in 1992. Replaced with another diesel UST. Another diesel UST abandoned in place in 1986.	Closure granted in 1996 for removed UST. Closure not yet granted for UST abandoned in place.
SA 100	Diesel UST removed in 1992.	Closure not yet granted.

Notes:
CS confirmed site
CSM conceptual site model
NTCRA non-time critical removal action
OWS oil and water separator
PRL potential release location
SA study area
SVS Small Volume Sites

UST underground storage tank

Sources: Building 252 RICS and FS (CH2MHill, 2010).
Follow-on Strategic Sites RICS Addenda and FS (CH2MHill, 2012).
Small Volume Sites RICS Addenda and FS (CH2MHill, 2011).

Summary of SVE Systems

SVE System	SVE System Description	FOSET # 2 Action Sites within ROI of SVE System
IC 23 SVE System	**Status:** Decommissioned December 2011 **Primary COCs:** TCE; 1,1-DCE; 1,2-DCA **Cumulative Mass Removed:** 4,260 lbs.	CS T-030 PRL S-017 PRL S-018
IC 27 SVE System	**Status:** Decommissioned December 2006 **Primary COCs:** TCE; Carbon Tetrachloride **Cumulative Mass Removed:** 431 lbs.	SA 045
IC 29 SVE System	**Status:** Decommissioned December 2011 **Primary COCs:** TCE; 1,2-DCA; Carbon Tetrachloride; 1,1,2,2-PCA; Chloroform; Naphthalene; 1,2,4-TMB **Cumulative Mass Removed:** 1,650 lbs.	PRL S-001 PRL S-017 SA 055 SA 066
IC 30 SVE System	**Status:** Decommissioned December 2011 **Primary COCs:** TCE; 1,2-DCA **Cumulative Mass Removed:** 125 lbs.	CS B-005 CS S-024 SA 063 SA 109 (F2)
IC 31 SVE System	**Status:** Currently operational **Primary COCs:** TCE; 1,2-DCA; cis-1,2-DCE **Cumulative Mass Removed:** 6,356 lbs.	CS 040 CS T-017 CS T-036 SA 055 SA 063 SA 100 SA 109 (F2)
IC 32 SVE System	**Status:** Decommissioned December 2011 **Primary COCs:** 1,2-DCA; Naphthalene **Cumulative Mass Removed:** 1,205 lbs.	CS 040 SA 055 SA 109 (F2)
IC 34 SVE System	**Status:** Currently operational, undergoing rebound study **Primary COCs:** TCE; 1,2-DCA **Cumulative Mass Removed:** 225 lbs.	CS T-016 CS S-007 SA 097
IC 35 SVE System	**Status:** Currently operational **Primary COCs:** cis-1,2-DCE; 1,2-DCA; Carbon Tetrachloride; TCE **Cumulative Mass Removed:** 1,855 lbs.	CS T-057 SA 080 SA 107 PRL S-002 PRL S-025

SVE System	SVE System Description	FOSET # 2 Action Sites within ROI of SVE System
IC 37 SVE System	**Status:** Currently operational **Primary COCs:** TCE; Benzene; Carbon Tetrachloride; PCE; cis-1,2-DCE; 1,2-DCA **Cumulative Mass Removed:** 13,936 lbs.	CS 038 CS S-026 SA 060 SA 097

Notes:

COC	contaminant of concern
CS	confirmed site
DCA	dichloroethane
DCE	dichloroethene
F2	the portion of the IRP site within FOSET # 2
IC (#)	Investigation Cluster
lbs	pounds
PCA	tetrachloroethane
PCE	tetrachloroethene
PRL	potential release location
ROI	radius of influence
SA	study area
SVE	soil vapor extraction
TCE	trichloroethene
TMB	trimethylbenzene

Sources: IC 27 Final STOP (CH2MHill, 2006).
Building 252 RICS and FS, Appendix I – STOP Analyses (CH2MHill, 2010).
Small Volume Sites RICS Addenda and FS, Appendix I – STOP Analyses (CH2MHill, 2011).
2012 Groundwater and SVE Annual Remediation Monitoring Report (URS, 2013).

ATTACHMENT C. SUMMARY OF SITE RISKS

Site	Residential Risk				Commercial/Industrial Risk				COC Risk Drivers		Selected Remedial Alternative(s)
	Soil		Shallow Soil Gas		Soil		Shallow Soil Gas				
	Carcinogenic Risk	Non-carcinogenic HI	Carcinogenic Risk	Non-carcinogenic HI	Carcinogenic Risk	Non-carcinogenic HI	Carcinogenic Risk	Non-carcinogenic HI	Soil	Shallow Soil Gas	
AOC G-3	6E-04	1	1E-04	3	8E-05	< 1	8E-06	< 1	Benzo(a)pyrene	Naphthalene	VOC2 Non-VOC4a
AOC G-4	1E-03	2	1E-04	3	1E-04	< 1	8E-06	< 1	Benzo(a)pyrene Benzo(a)anthracene Benzo(b)fluoranthene Indeno(1,2,3-c,d)pyrene	Naphthalene	VOC3 Non-VOC4a
AOC G-5	2E-03	3	4E-05	< 1	2E-04	< 1	2E-06	< 1	Benzo(a)pyrene Aroclor-1260	PCE TCE	VOC2 Non-VOC4a
CS 038	1E-04	2	8E-03	136	1E-05	< 1	5E-04	9	Naphthalene Benzo(a)pyrene	PCE 1,2,4-TMB 1,3,5-TMB	VOC3 Non-VOC4a
CS 040/ PRL S-006/ PRL S-019	1E-03	2	3E-04	5	1E-04	< 1	2E-05	< 1	Aroclor-1260 Benzo(a)pyrene Dibenzo(a,h)anthracene dieldrin	1,1-DCA cis-1,2-DCE PCE	VOC2 Non-VOC4a
CS B-005	4E-04	128	6E-06	< 1	3E-05	4	4E-07	< 1	Copper Manganese Arsenic	Benzene	VOC2 Non-VOC4a
CS S-007	7E-04	74	4E-04	2	2E-04	7	3E-05	< 1	Naphthalene 1,3-DCB	TCE cis-1,2-DCE	VOC3 Non-VOC4a
CS S-024	3E-05	5	5E-05	< 1	4E-06	< 1	3E-06	< 1	Aroclor-1260	PCE	VOC2 Non-VOC4a
CS S-026	9E-05	2	2E-04	58	7E-06	< 1	1E-05	4	Naphthalene	1,2,4-TMB PCE	VOC3 Non-VOC4a
CS T-012/ CS T-021	9E-06	3	< 1E-06	< 1	1E-06	< 1	< 1E-06	< 1	Benzo(a)pyrene	None	Non-VOC4a
CS T-016	1E-04	2	4E-05	< 1	9E-06	< 1	2E-06	< 1	1-Methylnaphthalene	Benzene Ethylbenzene	VOC2 Non-VOC4a
CS T-017	1E-04	2	1E-05	< 1	1E-05	< 1	7E-07	< 1	Benzo(a)pyrene Benzo(a)anthracene	Carbon Tetrachloride Chloroform TCE PCE	Non-VOC4a

Site	Residential Risk				Commercial/Industrial Risk				COC Risk Drivers		Selected Remedial Alternative(s)
	Soil		Shallow Soil Gas		Soil		Shallow Soil Gas				
	Carcinogenic Risk	Non-carcinogenic HI	Carcinogenic Risk	Non-carcinogenic HI	Carcinogenic Risk	Non-carcinogenic HI	Carcinogenic Risk	Non-carcinogenic HI	Soil	Shallow Soil Gas	
CS T-020	1E-07	5	3E-06	< 1	1E-08	< 1	2E-07	< 1	None	Benzene	VOC3 Non-VOC4a
CS T-030/ PRL S-018	2E-05	575	< 1E-06	< 1	3E-06	13	< 1E-06	< 1	Mercury PAHs	None	Non-VOC4a
CS T-036	1E-04	< 1	6E-07	< 1	8E-06	< 1	3E-08	< 1	Dieldrin	None	Non-VOC4a
CS T-047	5E-06	2	3E-04	5	2E-06	< 1	2E-05	< 1	2-Methylnaphthalene Naphthalene	PCE cis-1,2-DCE 1,1-DCA	VOC2 Non-VOC4a
CS T-057/ SA 080/ SA 107	5E-04	5	2E-03	9	4E-05	< 1	9E-05	< 1	Dioxins/Furans	TCE cis-1,2-DCE	VOC3 Non-VOC4a
PRL S-001	6E-05	9	4E-05	< 1	4E-06	< 1	3E-06	< 1	Cadmium	PCE Carbon Tetrachloride Chloroform	VOC2 Non-VOC4a
PRL S-002	1E-04	15	8E-06	< 1	1E-05	< 1	5E-07	< 1	Aroclor-1260	Naphthalene Benzene	Non-VOC4a
PRL S-017	5E-05	< 1	3E-05	< 1	4E-06	< 1	2E-06	< 1	None	TCE Carbon Tetrachloride	VOC2 Non-VOC4a
PRL S-025	8E-06	2	5E-06	< 1	1E-06	< 1	3E-07	< 1	Aroclor-1254 Aroclor-1260	Benzene	Non-VOC4a
PRL S-036	5E-06	8	3E-05	< 1	6E-07	< 1	2E-06	< 1	Aroclor-1260	Carbon Tetrachloride	Non-VOC4b
PRL S-043	2E-04	6	4E-05	< 1	2E-05	< 1	2E-06	< 1	Benzo(a)pyrene	PCE	VOC2 Non-VOC4b
PRL S-044	6E-04	7	2E-05	< 1	7E-05	< 1	1E-06	< 1	Benzo(a)pyrene Thallium	TCE	VOC2 Non-VOC4a
PRL S-045	6E-05	2	1E-05	< 1	4E-06	< 1	9E-07	< 1	Benzo(a)pyrene	Benzene	VOC2 Non-VOC4b
PRL T-032	3E-04	6	6E-05	60	2E-05	< 1	4E-06	4	Naphthalene	1,2,4-TMB 1,3,5-TMB	VOC3 Non-VOC4a
SA 004	4E-04	58	3E-04	3	5E-05	3	2E-05	< 1	Aroclor-1260	PCE	VOC2 Non-VOC4b
SA 045	5E-05	8	9E-06	< 1	3E-06	< 1	5E-07	< 1	1-Methylnaphthalene Naphthalene	Chloroform Benzene	Non-VOC4a
SA 049	1E-04	5	< 1E-06	< 1	8E-06	< 1	< 1E-06	< 1	Benzo(a)pyrene	None	Non-VOC4a
SA 055	1E-06	5	3E-05	< 1	1E-07	< 1	2E-06	< 1	Aroclor-1260	PCE	Non-VOC4b

Site	Residential Risk				Commercial/Industrial Risk				COC Risk Drivers		Selected Remedial Alternative(s)
	Soil		Shallow Soil Gas		Soil		Shallow Soil Gas				
	Carcinogenic Risk	Non-carcinogenic HI	Carcinogenic Risk	Non-carcinogenic HI	Carcinogenic Risk	Non-carcinogenic HI	Carcinogenic Risk	Non-carcinogenic HI	Soil	Shallow Soil Gas	
SA 060	2E-07	8	5E-06	< 1	3E-08	< 1	3E-07	< 1	None	TCE	Non-VOC4a
SA 063	2E-03	211	2E-06	< 1	2E-04	12	1E-07	< 1	Aroclor-1260	Chloroform	Non-VOC4a
SA 066	1E-10	< 1	2E-02	77	6E-11	< 1	1E-03	5	None	Chloroform Carbon Tetrachloride 1,2,4-TMB 1,3,5-TMB	VOC3 Non-VOC4a
SA 096	4E-05	< 1	5E-06	< 1	3E-06	< 1	3E-07	< 1	None	Naphthalene	Non-VOC4a
SA 097	5E-05	4	2E-03	8	4E-06	< 1	1E-04	< 1	4-Chloroaniline	TCE cis-1,2-DCE	VOC3 Non-VOC4a
SA 100	2E-04	2	1E-04	< 1	2E-05	< 1	8E-06	< 1	Benzo(a)pyrene Dioxins/Furans	Carbon Tetrachloride Chloroform	VOC2 Non-VOC4a
SA 109 (F2)	1E-04	12	< 1E-06	< 1	9E-06	< 1	< 1E-06	< 1	Cadmium Aroclor-1254 Aroclor-1260	None	Non-VOC4b

Notes:

AOC	area of concern
COC	contaminant of concern
CS	confirmed site
DCB	dichlorobenzene
DCA	dichloroethane
DCE	dichloroethene
HI	Hazard Index
PAH	polycyclic aromatic hydrocarbon
PCE	Tetrachloroethene
PRL	potential release location
SA	study area
TCE	trichloroethene
TMB	trimethylbenzene
VOC	volatile organic compound

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ATTACHMENT D. RATIONALE FOR SELECTED REMEDIES AND SITE FIGURES

AOC G-3: This site is approximately 7.8 acres and consists of a portion of a paved aircraft parking apron known as Mat V (18-inch thick concrete), a portion of Building 1106 (aircraft maintenance hangar), and surrounding unpaved areas. Activities associated with this site included aircraft washing, maintenance, and parking. Mat V was reportedly cracked and the aircraft wash liquid often seeped into the cracks faster than it would flow to the drains.

Selected Remedy: Alternatives VOC2 (ICs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use and ECs)

Contaminants Addressed: VOCs in SSG; PAHs in soil

Shallow Soil Gas: Risks are at the high end of the risk management range for unrestricted use and within the risk management range for restricted use; however, the HI for unrestricted use exceeds 1. Cumulative sample-by-sample carcinogenic risks for the residential scenario range from 9×10^{-7} to 1×10^{-4} and the non-carcinogenic HIs range from less than 1 to 3. For the occupational worker scenario, the carcinogenic risks range from 5×10^{-8} to 8×10^{-6}, and the non-carcinogenic HIs are less than 1. The COCs are benzene, methylene chloride, naphthalene, and PCE. Naphthalene concentrations exceeded the industrial use screening level, while concentrations of benzene, methylene chloride, and PCE exceeded unrestricted use screening levels.

Soil: Leaks, spills, and disposal of wastes to the ground surface as a result of aircraft maintenance and parking activities have impacted the site soil. Soil risks, primarily associated with PAHs, are greater than the risk management range for unrestricted use, and within the risk management range for restricted use. The carcinogenic risk for the residential scenario is 6×10^{-4} and the non-carcinogenic HI is 1. The carcinogenic risk for the occupational worker scenario is 8×10^{-5} and the non-carcinogenic HI is less than 1. PAHs were detected at concentrations greater than levels protective of surface water quality. The vertical extent of PAH contamination is limited to 1 foot bgs. The COCs are benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial (occupational) worker for combined exposure to soil and SSG is 8.8×10^{-5} and may exceed 10^{-4}, when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future land use for AOC G-3 is industrial. Alternatives VOC2 and Non-VOC4a were selected to address VOCs in SSG and to address PAHs in soil that pose a threat to surface water quality. ICs established by Alternative VOC2 will restrict the use of the site because although the carcinogenic risks are at the upper end of the risk management range, the HI for unrestricted use exceeds 1. VOC2 was selected over VOC3 because the risk for SSG does not exceed the risk management range for industrial use.

The industrial use target volume under Alternative Non-VOC4a is 7,950 cubic yards, and was selected to remove PAH-contaminated soil that exceeds levels protective of surface water quality. The unrestricted use target volume for Non-VOC4b is the same (7,950 cubic yards), but Non-VOC4a was selected over Non-VOC4b because uncertainties remain with regard to the delineation of PAHs under pavement. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the risk for unrestricted use exceeds the risk management range. The ICs require that if existing buildings on the site are demolished or significantly remodeled or the Mat V paved cover is removed, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are

exceeded. Soils with PAH contamination are present beneath Mat V cover. This soil will be addressed by maintaining a surface cover in the Mat V area as an engineered control.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

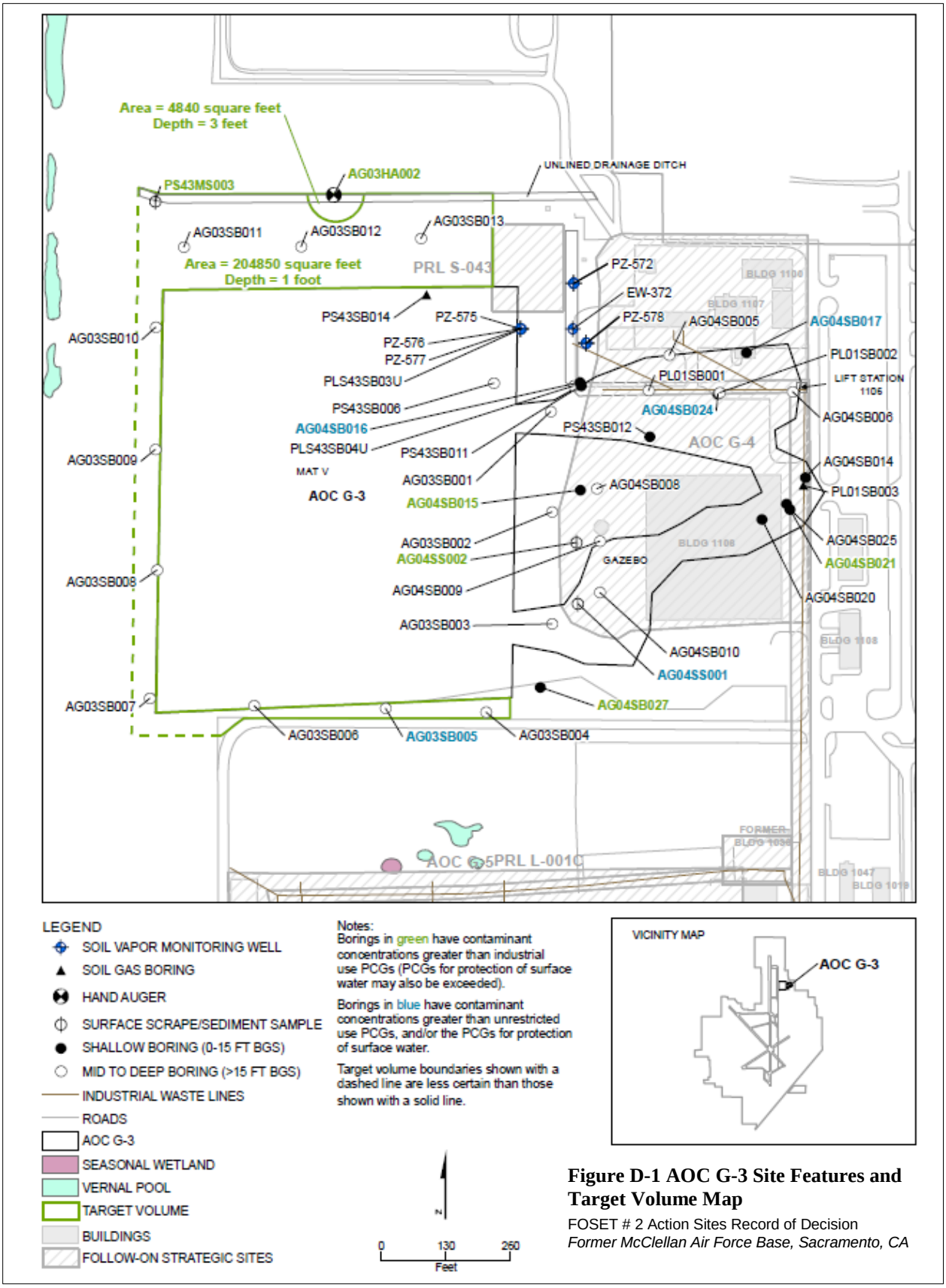

Figure D-1 AOC G-3 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

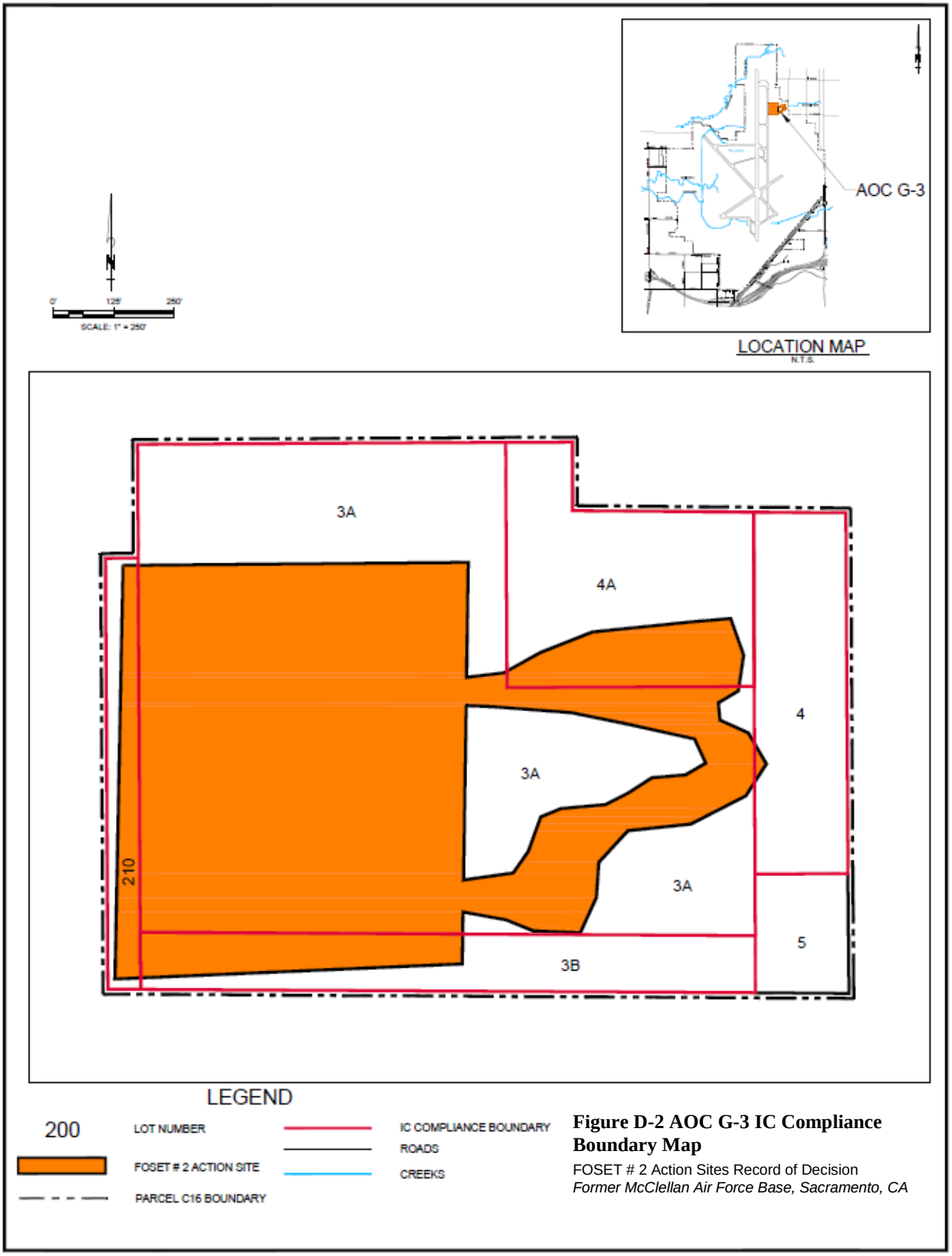

Figure D-2 AOC G-3 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

AOC G-4: This site is approximately 9.5 acres and consists of a portion of a paved aircraft parking apron known as Mat V and Buildings 1100 (aircraft support and wood shop), 1102 (aircraft maintenance), 1103 (drum storage area), 1105 (hazardous materials storage area), 1106 (open waste storage area), and 1107 (aircraft storage supply area and metals shop). A 250-gallon above-ground storage tank (AST) used to support a backup generator is located east of Building 1106 and trench drains that may have connected to the industrial waste line (IWL) are located at the north and south ends of Building 1106.

Selected Remedy: Alternatives VOC3 (ICs/ECs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; PAHs in soil

Shallow Soil Gas: Risks are at the high end of the risk management range of unrestricted use, and within the risk management range for restricted use; however, the HI for unrestricted use is greater than 1. The carcinogenic risks for the residential scenario range from 5×10^{-8} to 1×10^{-4}, and the non-carcinogenic HIs range from less than 1 to 3. For the occupational worker scenario, the carcinogenic risks range from 3×10^{-9} to 8×10^{-6}, and the non-carcinogenic HIs are less than 1. The COCs are 1,4-DCB, benzene, chloroform, methylene chloride, naphthalene, and PCE. Multiple VOCs were detected at concentrations greater than the unrestricted use screening levels, and naphthalene exceeded the industrial use cleanup level in two locations.

Soil: Releases from the hazardous waste disposal, hazardous materials storage, and/or aircraft shop and maintenance activities have impacted the surface and subsurface soil. Soil risks, primarily associated with PAHs, are greater than the risk management range for unrestricted use, and at the high end of the risk management range for restricted use. The carcinogenic risk for the residential scenario is 1×10^{-3}, and the non-carcinogenic HI is 2, due to arsenic and naphthalene. For the occupational worker scenario, the carcinogenic risk is 1×10^{-4}, and the non-carcinogenic HI is less than 1. PAHs were detected in surface samples at concentrations greater than levels for the protection of surface water quality. The COCs are benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene, and naphthalene.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 1.08×10^{-4} and may be higher when exposure to all pathways, including groundwater, are considered.

Rationale for Selected Remedies: The expected future land use for AOC G-4 is industrial. Alternatives VOC3 and Non-VOC4a were selected to address VOCs in SSG that exceed the HI of 1 for unrestricted use and to address PAHs in soil that pose a threat to surface water quality. VOC3 was selected over VOC2 due to the proximity of the IWL, which has not been pressure tested, and the possibility of releases from the IWL impacting AOC G-4. ICs and ECs established by Alternative VOC3 will restrict the use of the site and require the installation of engineered controls in any future buildings or during significant remodeling of existing buildings to mitigate the potential for VOCs in SSG from migrating into buildings and impacting occupants via the vapor inhalation pathway. The parcel and lots affected by the IC compliance buffer for Alternative VOC3 are Parcel C16, Lots 3A, 3B, 4, 4A, and 5. Because portions of the IC compliance buffer extend approximately 89 feet beyond the MBP property boundary, soil vapor sampling along the property boundary to evaluate the potential for off-site vapor intrusion is required.

The industrial use target volume under Alternative Non-VOC4a is 2,190 cubic yards, and was selected to remove PAHs in soil that exceed levels protective of surface water quality. The unrestricted use target volume of 3,420 cubic yards under Non-VOC4b was not selected because the future use for AOC G-4 is industrial. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because soil risks exceed the risk management range for unrestricted and the HI for unrestricted exceeds 1. The ICs require that if existing buildings on the site are demolished or

significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

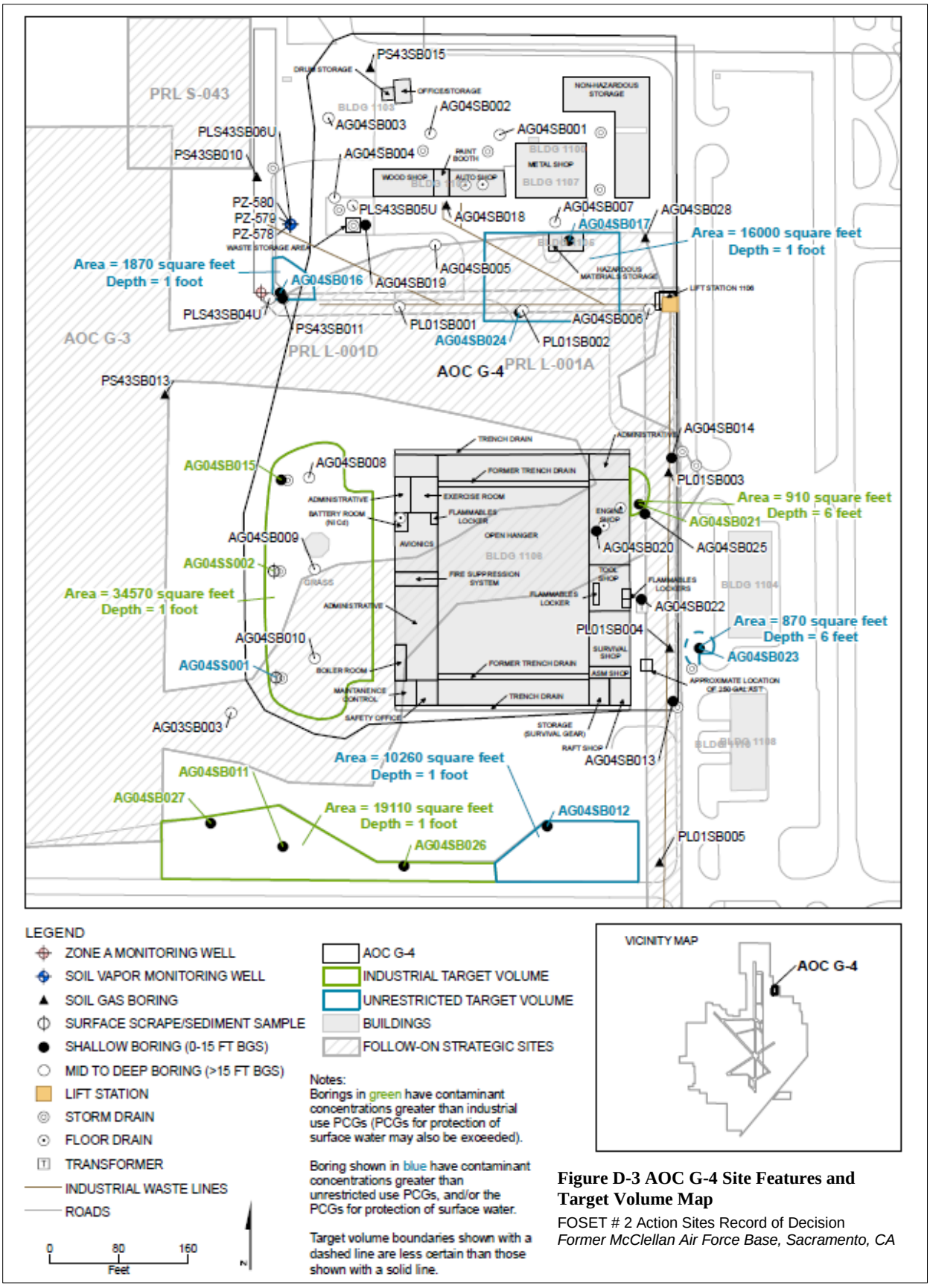

Figure D-3 AOC G-4 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

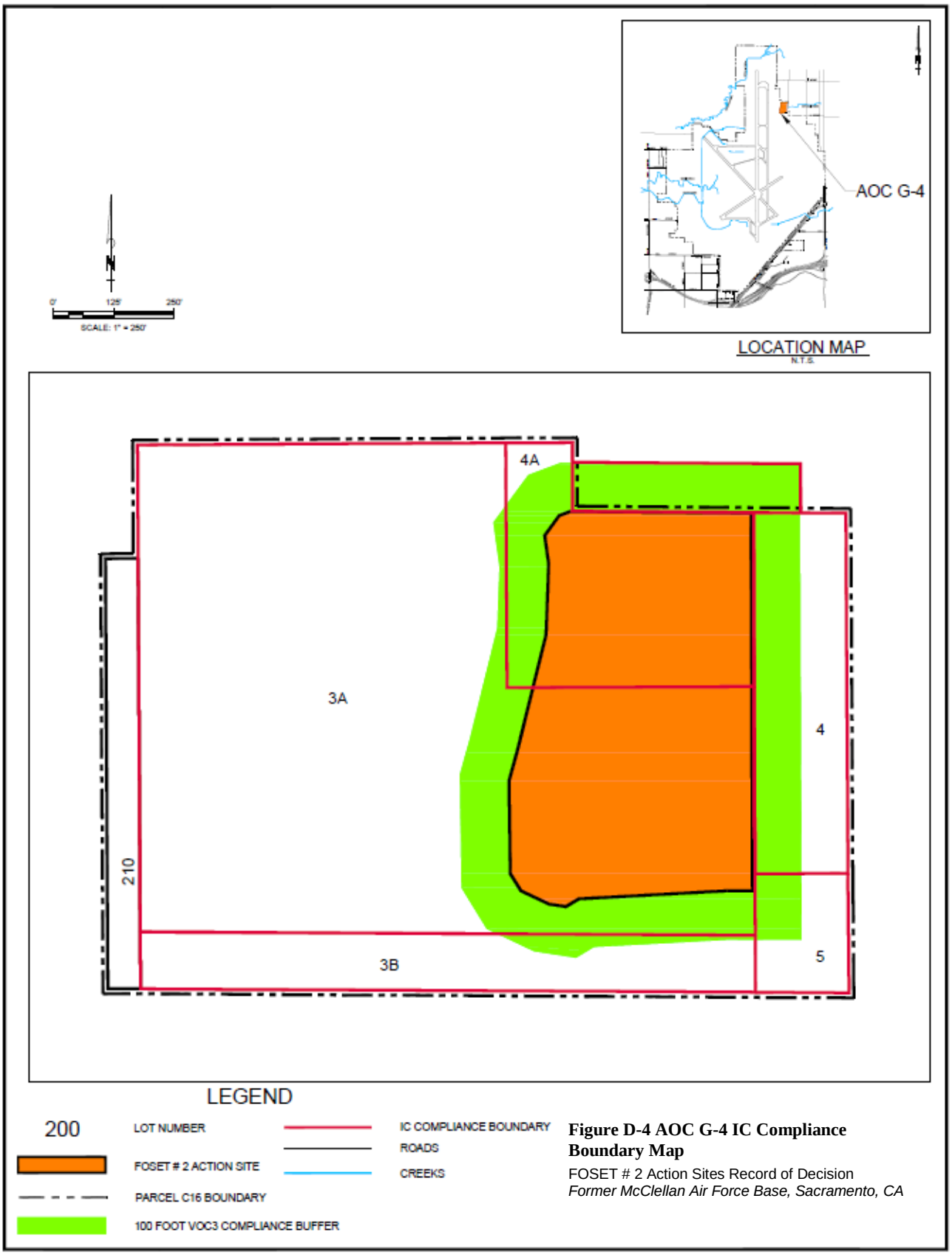

Figure D-4 AOC G-4 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

AOC G-5: This site is a portion of a paved aircraft parking apron known as Mat U, Building 1071 (aircraft maintenance shop), and a cemented and bermed hazardous waste storage area. The site covers approximately 950 feet by 950 feet. The maintenance activities performed in Building 1071 consisted of light, routine servicing of active duty aircraft, such as pre- and post-flight checks and minor services with oils, lubricants, and solvents. Historically, wastes were disposed to unpaved surfaces but were later contained in 55-gallon drums and transported to the hazardous waste storage area in the northwestern corner of the site. According to interviews, fuels were reportedly dumped into a shallow unlined trench located just north of MAT U and concrete collection sumps beneath the western and northern edges of the tarmac adjacent to the IWL were used for collection of liquid wastes, which were then pumped into 55-gallon drums for disposal.

Selected Remedy: Alternatives VOC2 (ICs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; PCBs, PAHs, and lead in soil

Shallow Soil Gas: Risks are within the risk management range for both unrestricted use and restricted use. The carcinogenic risks for the residential scenario range from 3×10^{-7} to 4×10^{-5}. For the occupational worker scenario, the carcinogenic risks range from 2×10^{-8} to 2×10^{-6}. The non-carcinogenic HIs for both scenarios are less than 1. The COCs are benzene, chloroform, naphthalene, PCE, and TCE.

Soil: Leaks, spills, and disposal of wastes have impacted the ground surface as a result of aircraft maintenance. Leaks from the drains, sumps, and/or IWL have impacted the subsurface soil. Soil risks, primarily associated with the PAHs, are greater than the risk management range for unrestricted and restricted use. In addition, the HI for unrestricted use is greater than 1. The carcinogenic risk for the residential scenario is 2×10^{-3}, and the non-carcinogenic HI is 3, due to arsenic, cadmium, and vanadium. For the occupational worker scenario, the carcinogenic risk is 2×10^{-4}, and the non-carcinogenic HI is less than 1. Aroclor-1260, lead, and PAHs were detected in surface samples at concentrations greater than levels for the protection of surface water quality. The COCs are Aroclor-1260, lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k) fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene, and chrysene. AOC G-5 was the only FOSET # 2 Action Site that was identified as potentially posing risk to ecological receptors in vernal pools onsite or nearby.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 2.02×10^{-4} and may be higher when exposure to all pathways, including groundwater, are considered.

Rationale for Selected Remedies: The expected future use for AOC G-5 is industrial. Alternatives VOC2 and Non-VOC4a were selected to address VOCs in SSG and to address PAHs in soil that exceed the risk management range for industrial use and pose a threat to surface water quality. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit potential exposures to VOCs in SSG. VOC2 was selected because the risk to potential future residents is above the middle of the carcinogenic risk range and because of uncertainty associated with the proximity of the IWL.

The industrial use target volume under Alternative Non-VOC4a is 5,480 cubic yards, and was selected to remove PAH-contaminated soil that exceeds industrial use cleanup levels and some locations where levels protective of surface water quality are exceeded; the remaining locations where COCs exceed levels protective of surface water quality will be addressed by ECs. The unrestricted use target volume of 13,780 cubic yards under Non-VOC4b was not selected because the future use for AOC G-5 is industrial. The existing surface cover(s) must be maintained by ECs. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure, because the soil risks exceed the risk management range for unrestricted use and the HI for unrestricted use exceeds 1. The ICs

require that if existing surface covers are removed or existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

Protection of ecological receptors will be achieved by eliminating the potential risks to benthic invertebrates from contaminants in soil and sediment through excavation and disposal of soil and sediment within seasonal wetland 654 at AOC G-5. Because the affected wetland is located in an area planned for future industrial use, the wetland will not be restored. Mitigation (purchase of credits in a habitat mitigation bank or payment of mitigation fees as compensation) will be required for the impacted wetland.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

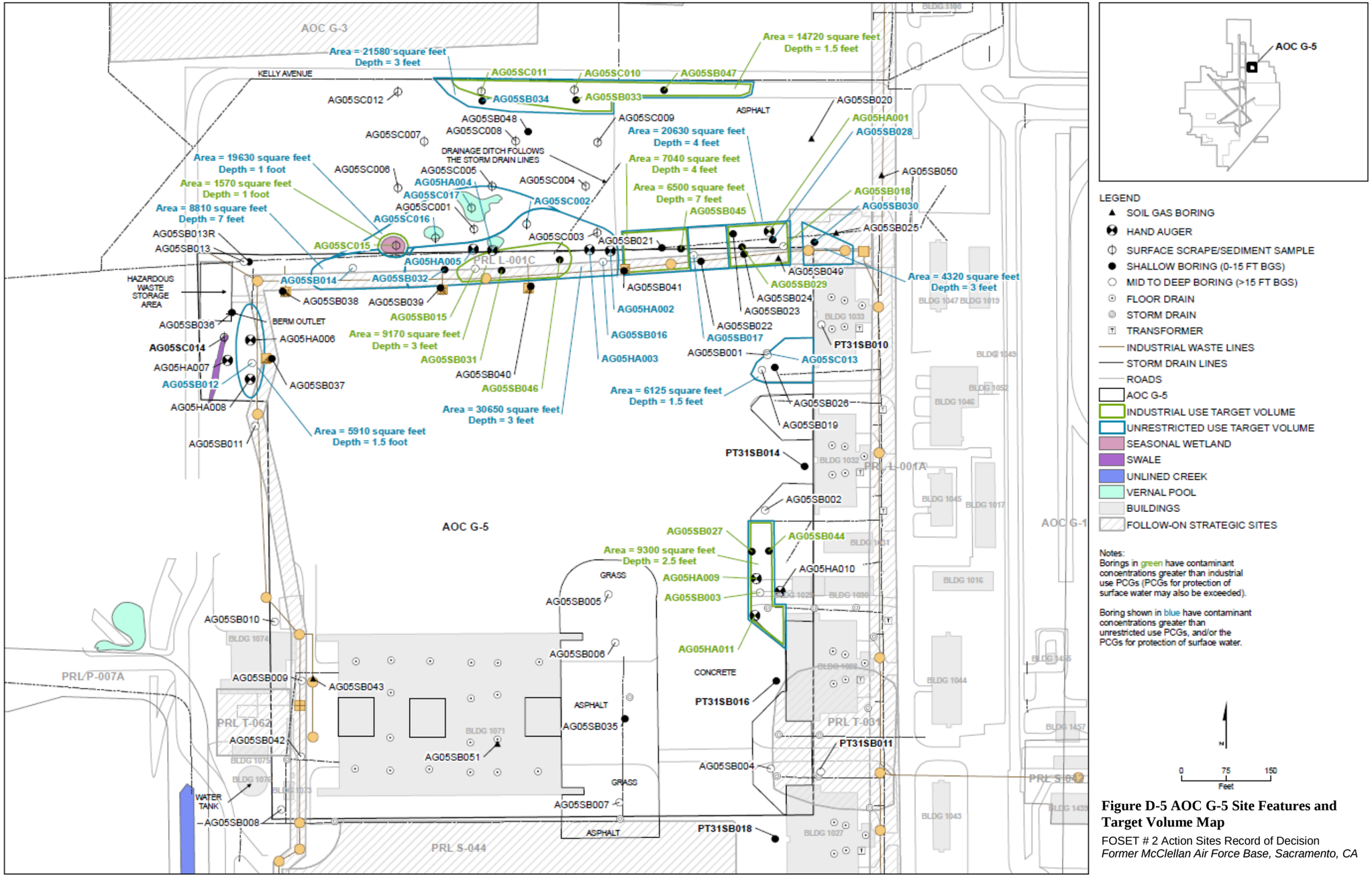

Figure D-5 AOC G-5 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

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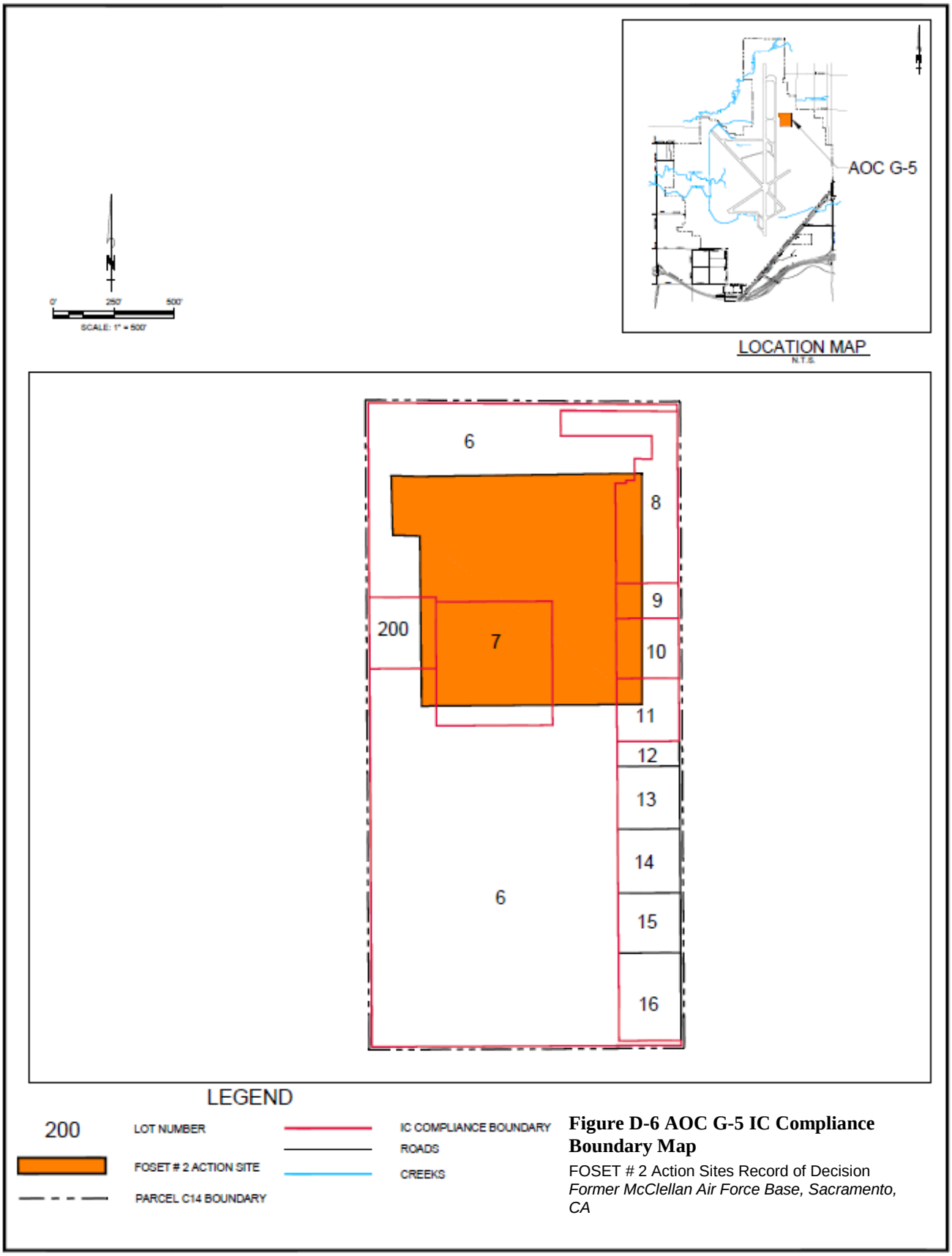

Figure D-6 AOC G-5 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS 038: This site consists of Building 475, which was a repair shop for large aircraft reciprocating engines; the building covers approximately 160,000 square feet. Several other industrial activities took place within Building 475, including electric motor repair, jet engine repair, welding, metalwork, laser etching, sand-blasting, solvent spray, and storage. Two USTs used to store carbon removal solvents have been abandoned in place in Building 475F. No additional information regarding these USTs is available. An approximately 2,250-gallon Stoddard/waste solvent (TCE) UST was also discovered at CS 038, and it was removed on November 3, 2009, but has not been granted closure status. This tank was removed and appeared to be in good condition without any visible cracks, holes, or other defects. The underground and aboveground piping associated with the tank was also removed.

Selected Remedy: Alternatives VOC3 (ICs/ECs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; TPH-G in soil

Shallow Soil Gas: Risks are greater than the risk management range for both unrestricted and restricted use and HI values for both use scenarios are greater than 1. The cumulative sample-by-sample carcinogenic risks for the residential scenario range from 2×10^{-6} to 8×10^{-3} and total non-carcinogenic HIs range from less than 1 to 136. Carcinogenic risks for the occupational worker scenario range from 1×10^{-7} to 5×10^{-4} and non-carcinogenic HIs range from less than 1 to 9. CS 038 is within the radius of influence of the IC 37 SVE system. The COCs are benzene, carbon tetrachloride, chloroform, 1,4-DCB, ethylbenzene, hexane, naphthalene, PCE, TCE, 1,3,5-TMB, 1,2,4-TMB, and vinyl chloride.

Soil: Leaks from USTs, piping, other tanks, the IWL, and possible burial pits have impacted the subsurface soil. The carcinogenic risk for the residential scenario is 1×10^{-4}, and the non-carcinogenic HI is 2, due to arsenic. Arsenic was the main driver of soil risk, but with one exception, soil concentrations were within the range of natural background variation. Soil risks (excluding arsenic) are below the risk management range for unrestricted use. Including arsenic, soil risks are at the high end of the risk management range for unrestricted use and within the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. For the occupational worker scenario, the carcinogenic risk is 1×10^{-5}, and the non-carcinogenic HI is less than 1. One TPH-G concentration exceeded the screening level for protection of groundwater. TPH-G is the only COC in soil.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 5.1×10^{-4} and may be higher when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for CS 038 is industrial. Alternatives VOC3 and Non-VOC4a were selected to address VOCs in SSG that exceed the risk management range for industrial use and TPH-G in soil that poses a threat to groundwater quality. VOC3 was selected over VOC2 because the carcinogenic risk in one sampling location exceeds the risk management range for residential use and industrial use, so restricted use alone will not be sufficient to protect workers. The ICs and ECs established by Alternative VOC3 will restrict the use of the site and require the installation of engineered controls in any future buildings or during significant remodeling of existing buildings to mitigate the potential for VOCs in SSG from migrating into buildings and impacting occupants via the vapor inhalation pathway. The parcels and lots affected by the IC compliance buffer for Alternative VOC3 are Parcel B2, Lots 123A, 123B, 123C, and 124; and Parcel B3, Lots 125 and 126. Because portions of the IC compliance buffer extend approximately 43 feet beyond the MBP property boundary, soil vapor sampling along the property boundary to evaluate the potential for off-site vapor intrusion is required.

The industrial use target volume under Alternative Non-VOC4a is 230 cubic yards, and was selected to remove TPH-G contaminated soil that exceeds levels protective of groundwater quality. The unrestricted

use target volume for Non-VOC4b is the same (230 cubic yards) because the excavation volume is based on the removal of soil for the protection of groundwater quality. Non-VOC4b was not selected because the future use for CS 038 is industrial. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

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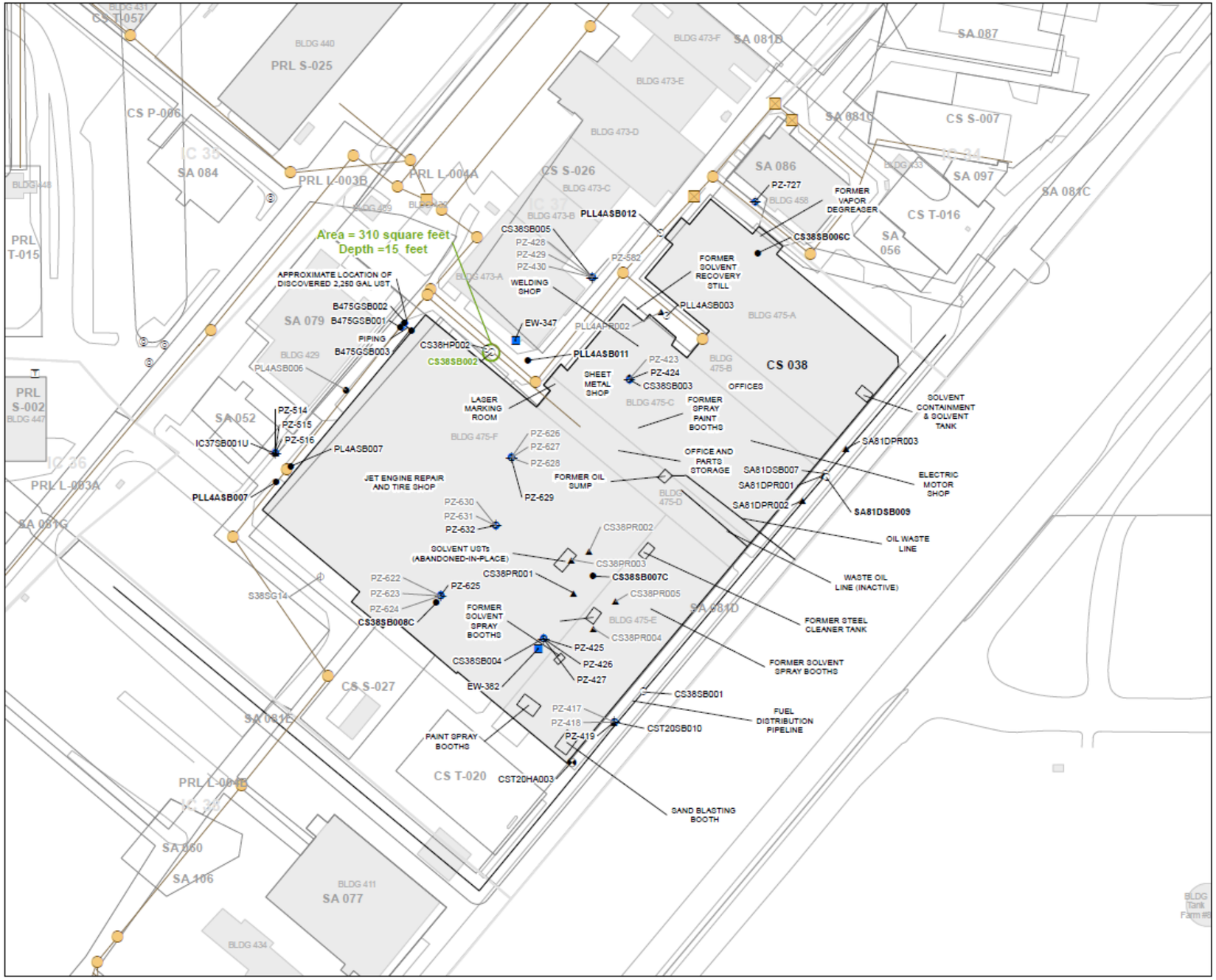

Figure D-7 CS 038 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

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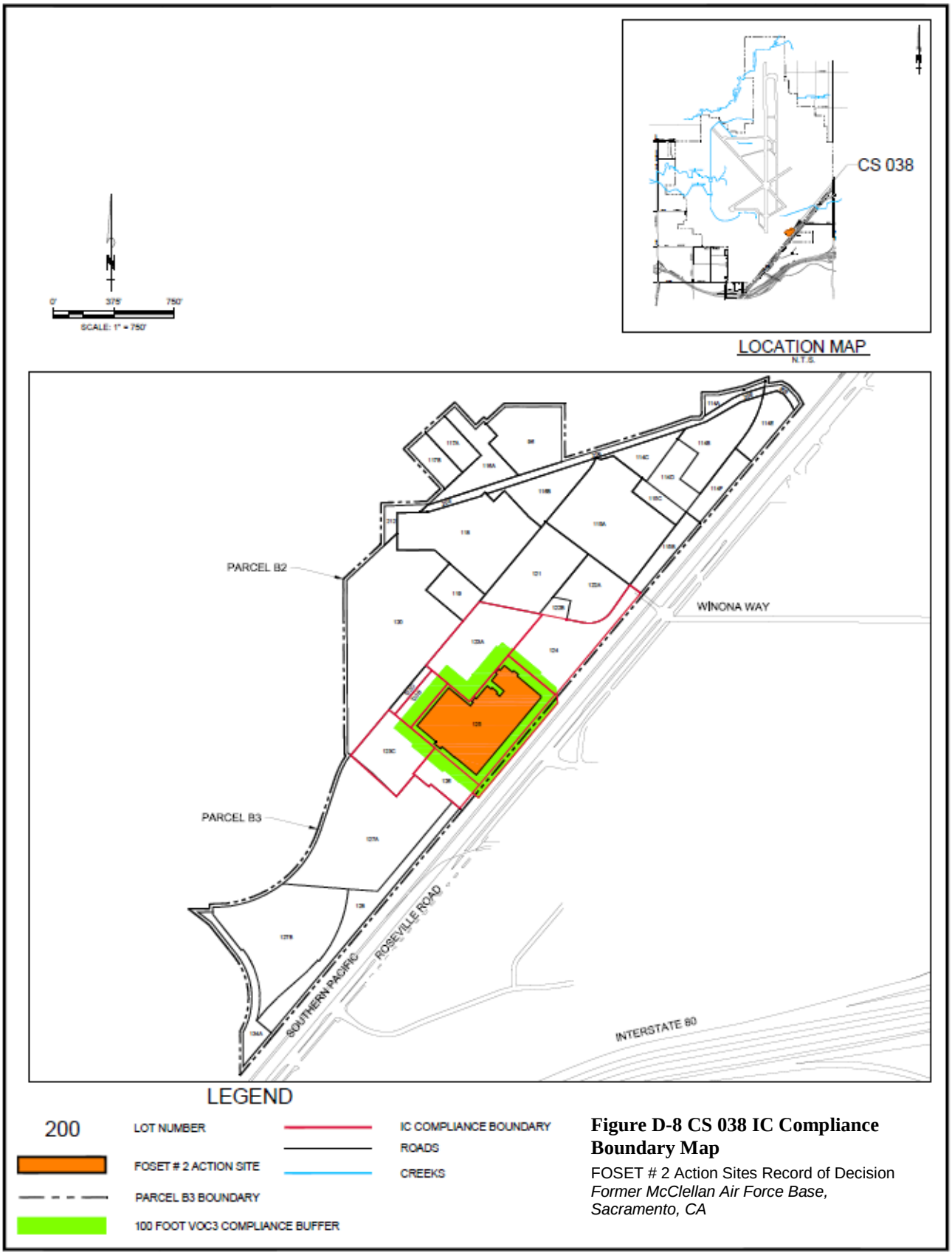

Figure D-8 CS 038 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS 040: This site consists of eight sludge drying beds that were used during operations at former industrial waste treatment plant (IWTP) #1. The drying beds, which were originally constructed over relatively impermeable soil, were 190 feet long 110 feet wide and 1 foot deep and were used to dewater sludge from the IWTP #1. The drying beds were demolished in 1994. After demolition in 1994, fill was used to bring the former IWTP area to grade before paving. Prior investigations have found PAH contamination within the fill used to bring parts of CS 040 to grade in the southern portion of the site.

Selected Remedy: Alternatives VOC2 (ICs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; PCBs, PAHs, pesticides, and lead in soil

Shallow Soil Gas: Risks are greater than the risk management range for unrestricted use, and within the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. For the residential scenario, carcinogenic risks ranged from 5×10^{-7} to 3×10^{-4}, and the non-carcinogenic HI ranged from less than 1 to 5. For the occupational worker scenario, carcinogenic risks ranged from 3×10^{-8} to 2×10^{-5}, and the non-carcinogenic HI was less than 1. The northern portion of CS 040 is within the 300-foot radius of influence of the IC 32 SVE system. The COCs are 1,1-DCA, benzene, chloroform, cis-1,2-DCE, naphthalene, PCE, TCE, and vinyl chloride. It should be noted that Ra-226 was previously a soil COC at CS 040; however, Ra-226 contamination was removed during the SVS and Building 252 Radiological NTCRA and is no longer a COC for CS 040. A total of 7,460 cubic yards of contaminated soil were removed.

Soil: Releases from sludge stored at CS 040 have impacted the subsurface soil, and overflows during rain events have impacted the surface soil. Soil risks, primarily associated with PCBs, pesticides, and PAHs, are greater than the risk management range for unrestricted use, and at the high end of the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. The carcinogenic risk for the residential scenario is 1×10^{-3}, and the non-carcinogenic HI is 2, due to arsenic, cadmium and Aroclor-1260. For the occupational worker scenario, the carcinogenic risk is 1×10^{-4}, and the non-carcinogenic HI is less than 1. Lead, PAHs, and PCBs were detected at concentrations greater than levels for protection of surface water quality. The COCs are Aroclor-1260, dieldrin, lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene. It should be noted that Ra-226 was previously a soil COC at CS 040; however, Ra-226 contamination was removed during the SVS and Building 252 Radiological NTCRA and is no longer a COC for CS 040. A total of 7,460 cubic yards of contaminated soil were removed.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 1.2×10^{-4} and may be higher when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for CS 040 is industrial. Alternatives VOC2 and Non-VOC4a were selected to address VOCs in SSG that exceed the risk management range for unrestricted use and to address PAHs in soil that exceed the risk management range for industrial use and lead, PAHs, and PCBs in soil that pose a threat to surface water quality. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit exposures to VOCs in SSG, because risks are greater than the risk management range for unrestricted use. VOC2 was selected over VOC3 because the risk for SSG does not exceed the risk management range for industrial use.

The combined industrial use target volume under Alternative Non-VOC4a for adjacent sites CS 040, PRL S-006, and PRL S-019 is 12,248 cubic yards, and was selected to remove PAHs in soil that exceed industrial use cleanup levels as well as lead, PAHs, and PCBs in soil that exceed levels protective of surface water quality. The SVS and Building 252 Radiological NTCRA only addressed Ra-226. If contamination is found when delineation sampling is done for the remaining contaminated soil, the

backfill placed when the SVS and Building 252 Radiological NTCRA was completed will be removed and stockpiled for use in backfilling the excavations associated with the selected remedy. If the delineation samples indicate that contamination has been addressed, additional excavation will not be necessary. The unrestricted use target volume of 17,040 cubic yards under Non-VOC4b was not selected because the future use for CS 040, PRL S-006, and PRL S-019 is industrial, there will be ICs associated with VOC2, and the HI for unrestricted use exceeds 1. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the soil risks exceed the risk management range for unrestricted use and the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

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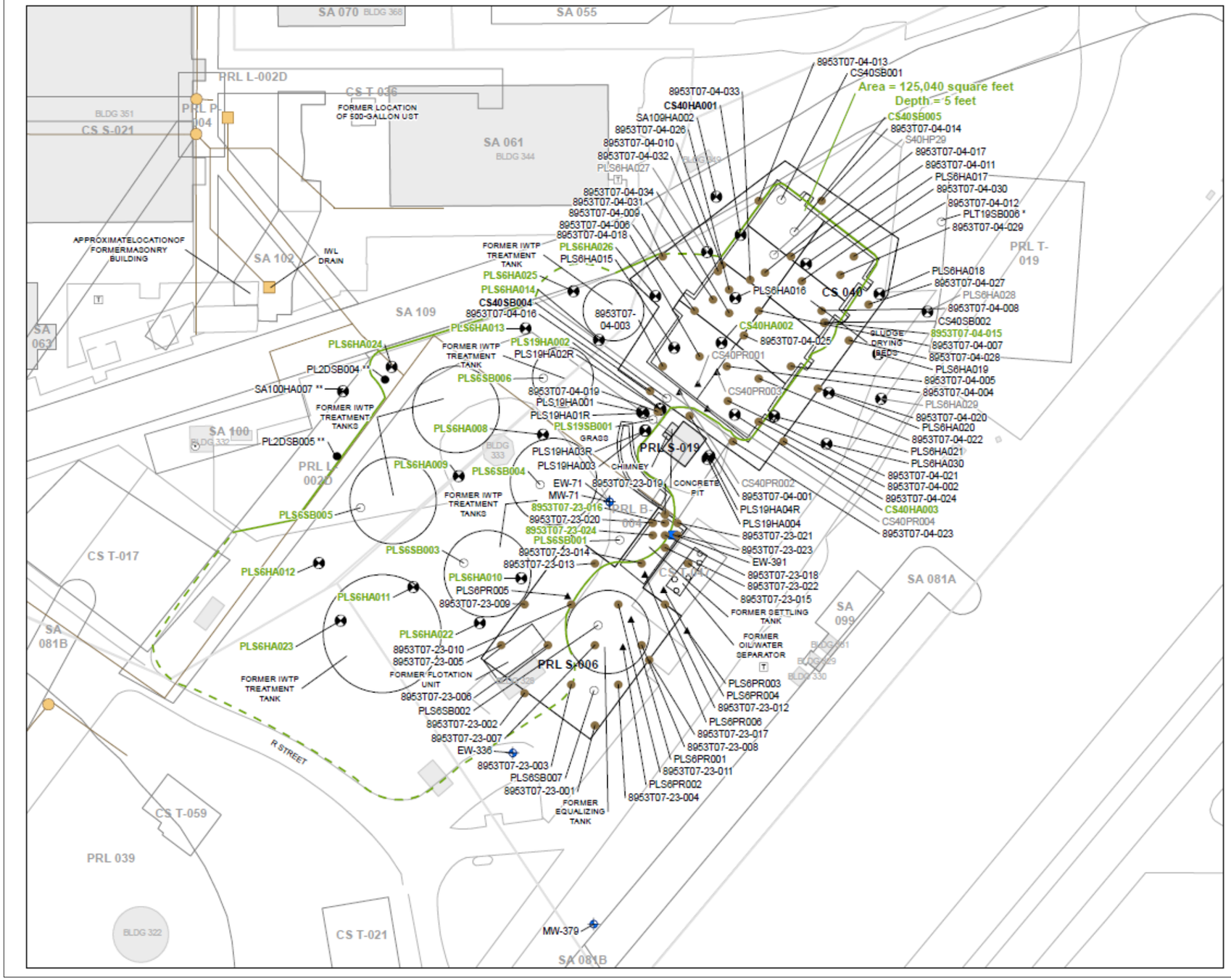

Figure D-9 CS 040, PRL S-006, and PRL S-019 Site Features and Target Volume Map
FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

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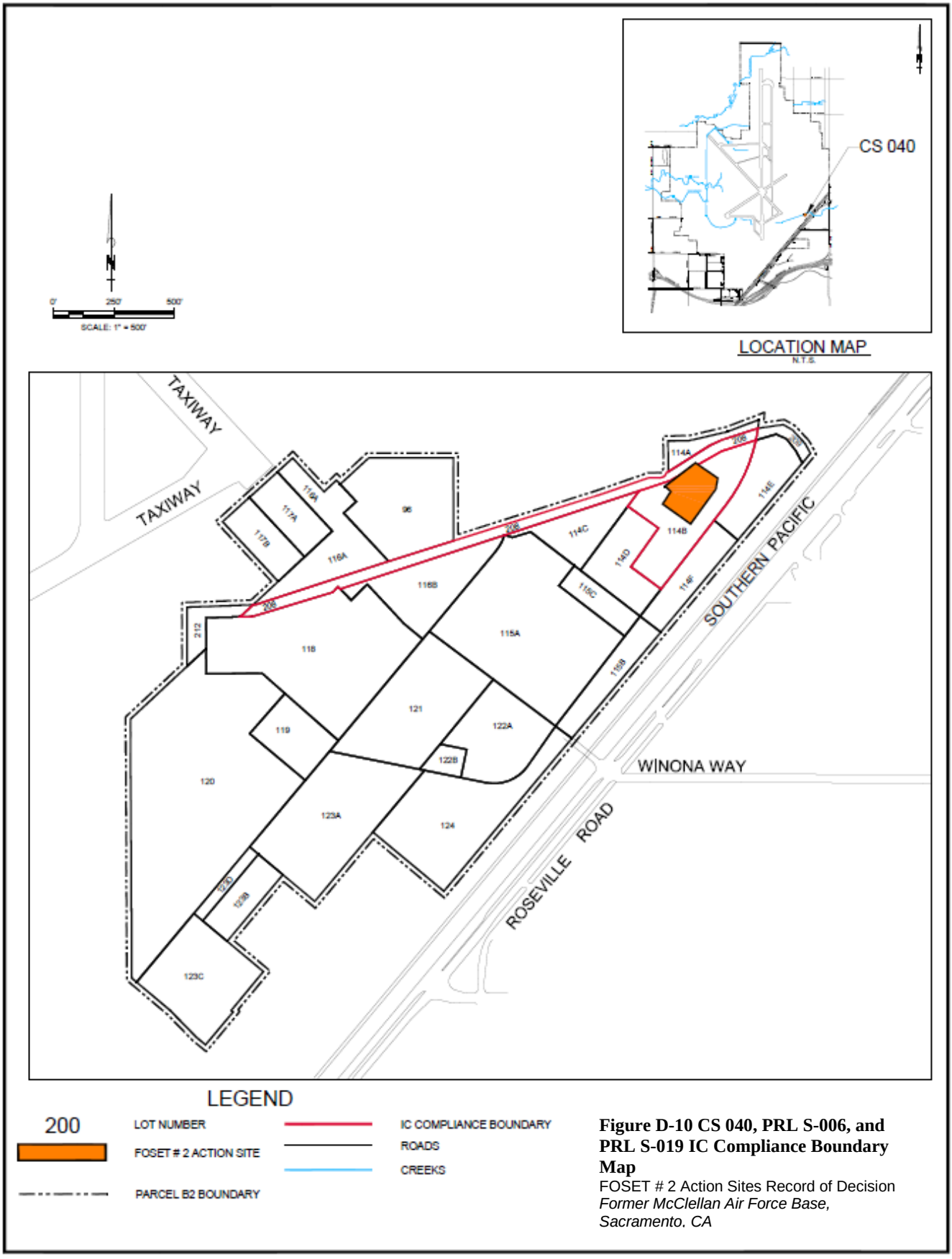

Figure D-10 CS 040, PRL S-006, and PRL S-019 IC Compliance Boundary Map
FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS B-005: This site consists of an active fueling station which has four 20,000-gallon USTs that contain diesel and gasoline, installed in 1991. The USTs and refueling station are not considered part of the CSM for CS B-005 because the station was installed in 1991 in accordance with California regulations. CS B-005 was originally identified as an IRP site because it was an undeveloped area whose surface soil may have been impacted by petroleum residues in surface runoff from adjacent parking lots. In October 2006, areas of blackened material were discovered while trenching along the southwestern border of CS B-005 as part of construction activities. Buried debris from an undetermined source has also been encountered at CS B-005.

Selected Remedy: Alternatives VOC2 (ICs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; PCBs, dioxins/furans, and metals in soil

Shallow Soil Gas: Risks are within the risk management range for unrestricted use, and below the risk management range for restricted use. The carcinogenic risk for the residential scenario ranges from 2×10^{-7} to 6×10^{-6}. The carcinogenic risk for the occupational worker scenario ranges from 1×10^{-8} to 4×10^{-7}. The HIs for both scenarios are less than 1. The northern portion of CS B-005 is within the radius of the IC 30 SVE system. Benzene is identified as a COC in shallow soil gas because of the uncertainty in the CSM (trenches with waste were unexpected) and the low number of shallow soil gas samples collected from the site. The COC is benzene.

Soil: Buried debris from an undetermined source has impacted the subsurface soil. Soil risks, driven by metals and dioxins/furans, exceed the risk management range for unrestricted use and are within the risk management range for restricted use. The HI values for both use scenarios exceed 1. The carcinogenic risk in soil for the residential scenario is 4×10^{-4}, and the HI is 128, due to antimony, arsenic, cadmium, cobalt, copper, manganese, mercury, nickel, and zinc. For the occupational worker scenario, the carcinogenic risk is 3×10^{-5}, and the non-carcinogenic HI is 4. The primary risk drivers include cadmium, copper, manganese, zinc, arsenic, and dioxins/furans. Lead concentrations exceeded the industrial use screening levels. Contaminants were not detected in surface soil exceeding surface water screening levels. Arsenic, cadmium, and lead in soil were detected at concentrations exceeding the levels for protection of groundwater. The COCs are antimony, arsenic, benzo(a)pyrene, cadmium, cobalt, copper, lead, manganese, zinc, and dioxins/furans. It should be noted that Ra-226 was previously a soil COC at CS B-005; however, Ra-226 contamination was removed during the SVS and Building 252 Radiological NTCRA and is no longer a COC for CS B-005. A total of 7,325 cubic yards of contaminated soil and asphalt were removed.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 3.04×10^{-5} and may exceed 10^{-4} when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for CS B-005 is industrial. Alternatives VOC2 and Non-VOC4a were selected to address VOCs in SSG and to address PAHs, metals, and dioxins/furans in soil that exceed the industrial HI of 1 as well as metals that pose a threat to groundwater quality. Although SSG risks are within the risk management range, soil gas samples were only collected from two locations (CSB5SB002 and CSB5SB003) at CS B-005, which is insufficient to characterize SSG. VOC2 was selected due to this uncertainty. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit exposures to VOCs in SSG.

The industrial use target volume under Alternative Non-VOC4a is 3,328 cubic yards, and was selected to remove PAHs, metals, and dioxins/furans in soil that exceed industrial cleanup levels and levels protective of groundwater quality The RAR for CS B-005 indicates that confirmation samples for dioxins and furans were not collected in areas where dioxins and furans were detected above CLs. If additional excavation is found to be necessary when delineation sampling is done for the remaining contaminated

soil, the backfill placed when the SVS and Building 252 Radiological NTCRA was completed will be removed and stockpiled for use in backfilling the excavations associated with the selected remedy. If the delineation samples indicate that contamination has been addressed, additional excavation will not be necessary. The unrestricted use target volume of 16,640 cubic yards under Non-VOC4b was not selected because the future use for CS B-005 is industrial. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because soil risks exceed the risk management range for unrestricted use and the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

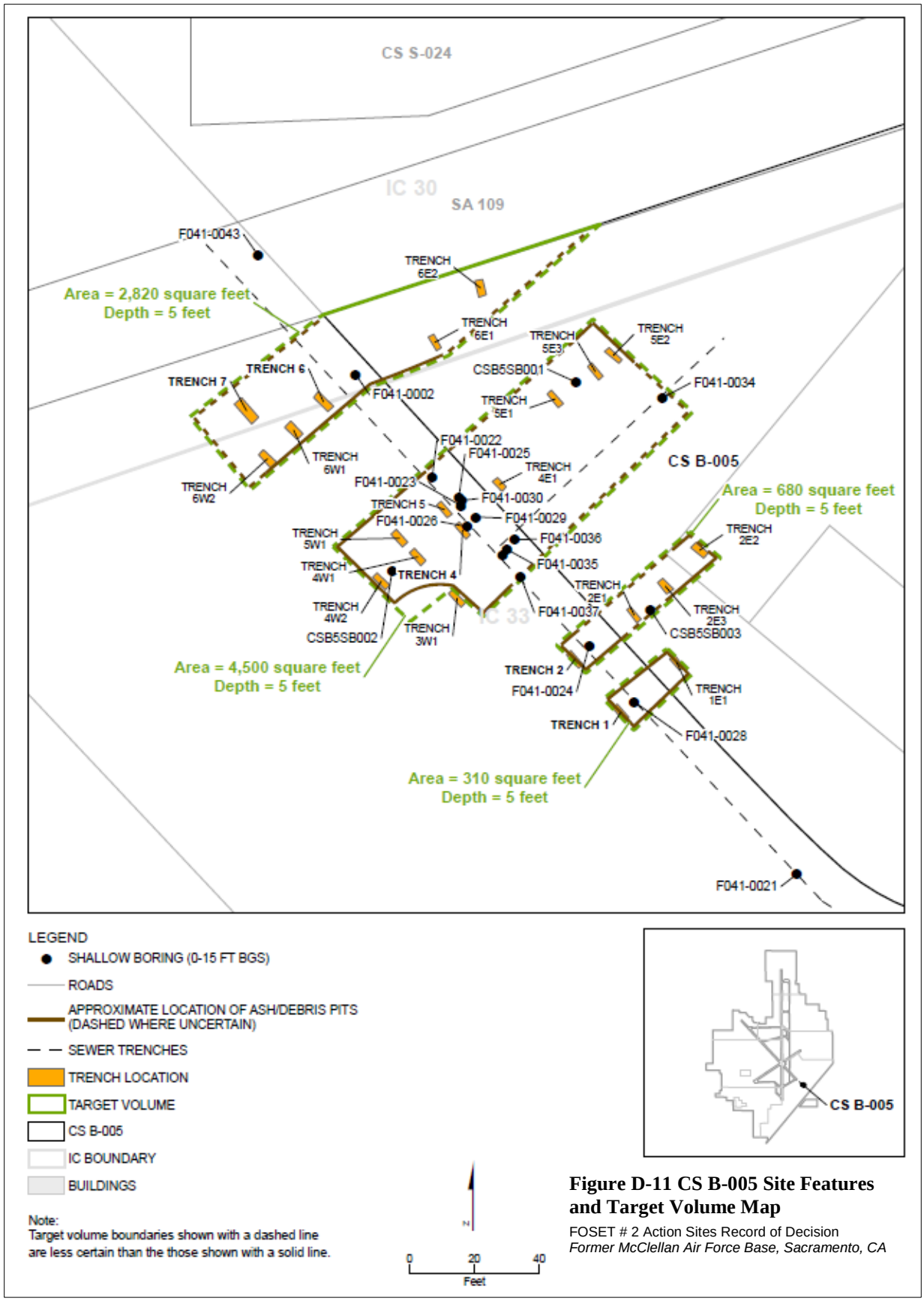

Figure D-11 CS B-005 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

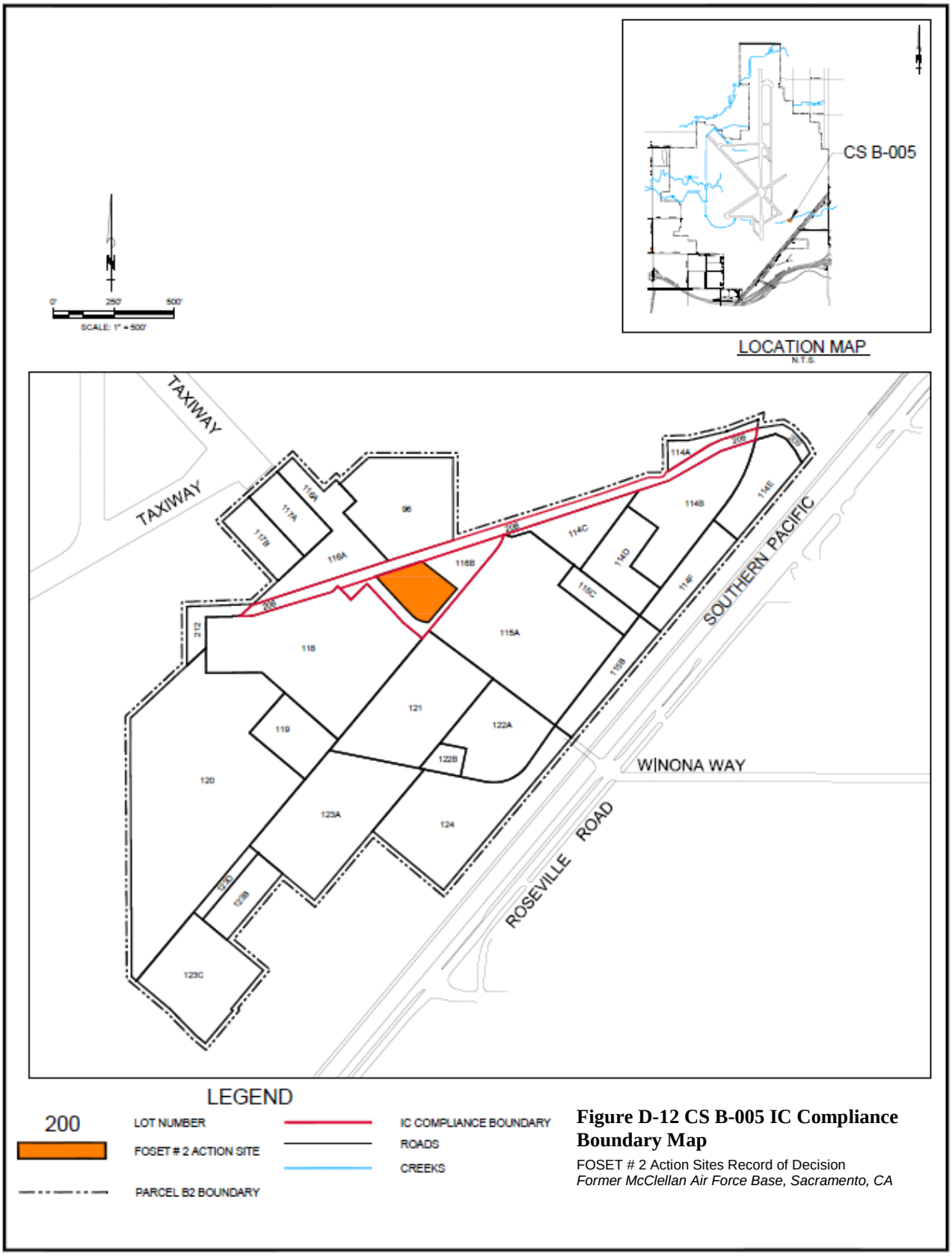

Figure D-12 CS B-005 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS S-007: This site is the former location of water cooling ponds, used to cool water from the reciprocating engine test buildings, and IWTP #3. A free oil separator, oil sump, clarifying tank, air saturation tank, flotation tank, 60,000-gallon holding tank, bleed-off tank, two backup holding tanks, raw waste holding tank, two sand filters, cooling pond, and underground holding tank were associated with IWTP #3. The plant treated wash waste from Building 475 and Building S-692 that contained free and emulsified oil with phenol content between 200 and 1,000 ppm. All IWTP #3 structures were removed in 1981. The site was then converted to a storage area for maintenance equipment and is currently paved.

Selected Remedy: Alternatives VOC3 (ICs/ECs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; TPH-G in soil

Shallow Soil Gas: Risks are greater than the risk management range for unrestricted use, and within the risk management range for restricted use. The HI for unrestricted use is greater than 1. The estimated cumulative carcinogenic risks for the residential scenario range from 3×10^{-6} to 4×10^{-4}, and the total non-carcinogenic HIs range from less than 1 to 2. The estimated carcinogenic risks in soil gas for the occupational worker scenario range from 2×10^{-7} to 3×10^{-5}, and the non-carcinogenic HIs are less than 1. CS S-007 was within the radius of influence of EW-345 from IC 34 SVE system. The COCs are benzene, ethylbenzene, naphthalene, PCE, and TCE.

Soil: Releases from the cooling pond, site tanks, and associated underground piping have impacted the surface and subsurface soil. Soil risks, driven by a single elevated naphthalene detection, exceed the risk management range for both unrestricted and restricted use. Excluding naphthalene, soil risks would be within the risk management range for restricted use. The HI values for both use scenarios are greater than 1. The carcinogenic risk is 7×10^{-4} for the residential scenario and 2×10^{-4} for the occupational worker scenario. The non-carcinogenic HI for the residential scenario is 74, due to naphthalene, arsenic, 1,2-DCB, 1,3-DCB, and 4-chloroaniline, and the HI for the occupational worker scenario is 7. Lead and PAHs were detected at concentrations greater than levels for protection of surface water quality and TPH-D was detected at concentrations greater than levels for protection of groundwater quality. The COCs identified in soil are benzo(a)pyrene, benzo(a)anthracene, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene, naphthalene, 1,2-DCB, 1,3-DCB, 1,4-DCB, TPH-D, and lead.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 2.3×10^{-4} and may be higher when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for CS S-007 is industrial. Alternatives VOC3 and Non-VOC4a were selected to address VOCs in SSG that exceed the risk management range for unrestricted use and to address lead and PAHs in soil that exceed the risk management range for industrial use and pose a threat to surface water quality as well as TPH-D in soil that poses a threat to groundwater quality. Alternative VOC3 was selected over VOC2 because only three locations were sampled for SSG, which is insufficient to fully characterize this large and complex site and restricted use alone may not be sufficient to protect workers. The ICs and ECs established by Alternative VOC3 will restrict the use of the site and require the installation of engineered controls in any future buildings or during significant remodeling of existing buildings to mitigate the potential for VOCs in SSG from migrating into buildings and impacting occupants via the vapor inhalation pathway. The parcel and lots affected by the IC compliance buffer for Alternative VOC3 are Parcel B2, Lots 123A and 124.

The industrial use target volume under Alternative Non-VOC4a is 420 cubic yards, and was selected to remove lead and PAHs in soil that exceed industrial cleanup levels and levels for surface water quality protection, as well as TPH-D in soil that exceed levels for protection of groundwater quality. ECs will be required where excavation is not planned. Sampling at the site and a recent site visit confirm that engineered controls will be needed to protect surface water quality. The unrestricted use target volume of

630 cubic yards under Non-VOC4b was not selected because the future use for CS S-007 is industrial. Lead and PAHs exceed the cleanup level for surface water quality protection and will require ECs where excavation is not planned. The existing surface cover(s) must be maintained by ECs. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because soil risks exceed the risk management range for unrestricted use and the HI for unrestricted use exceeds 1 The ICs require that if the existing surface covers are removed or existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

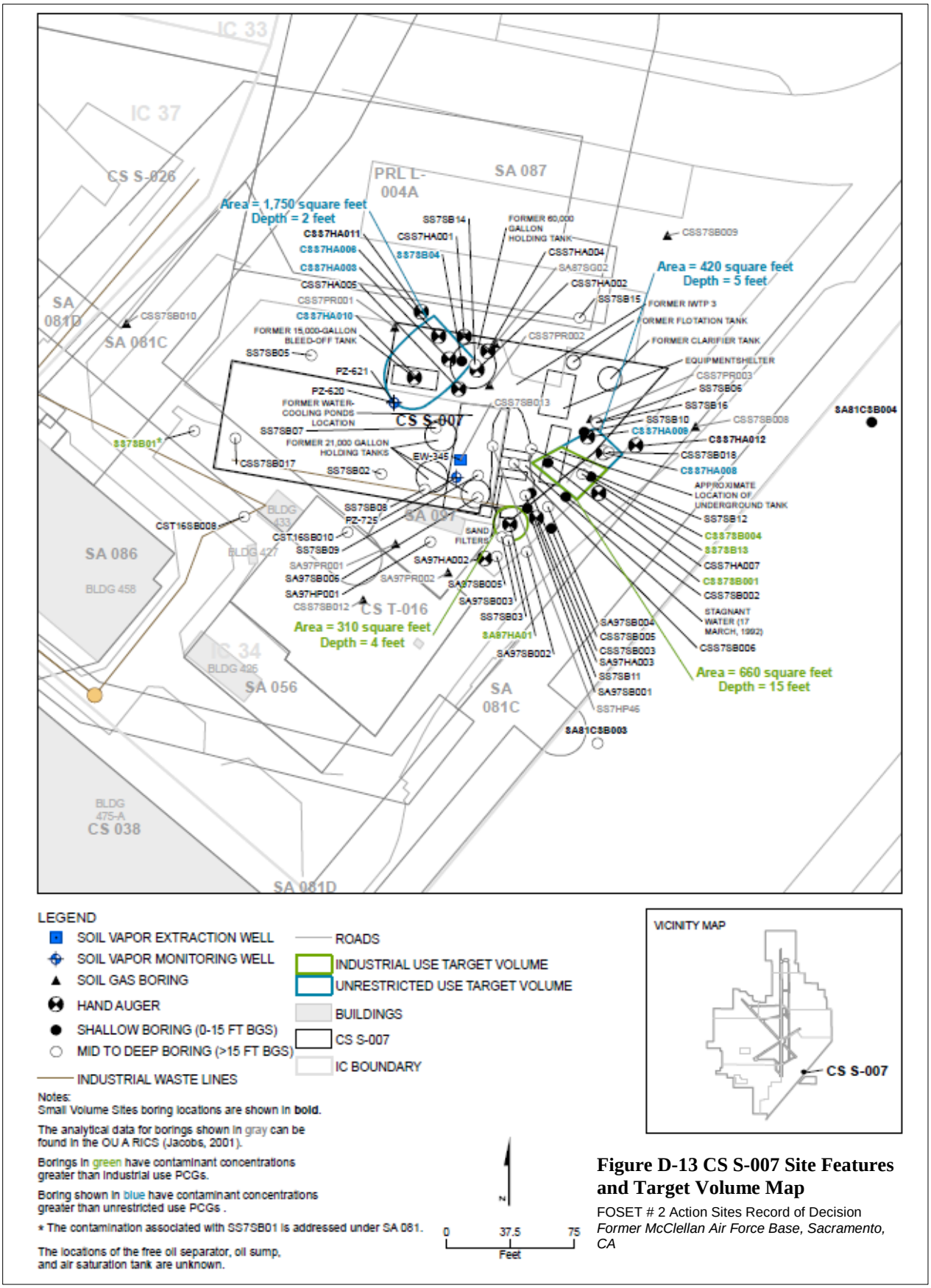

Figure D-13 CS S-007 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

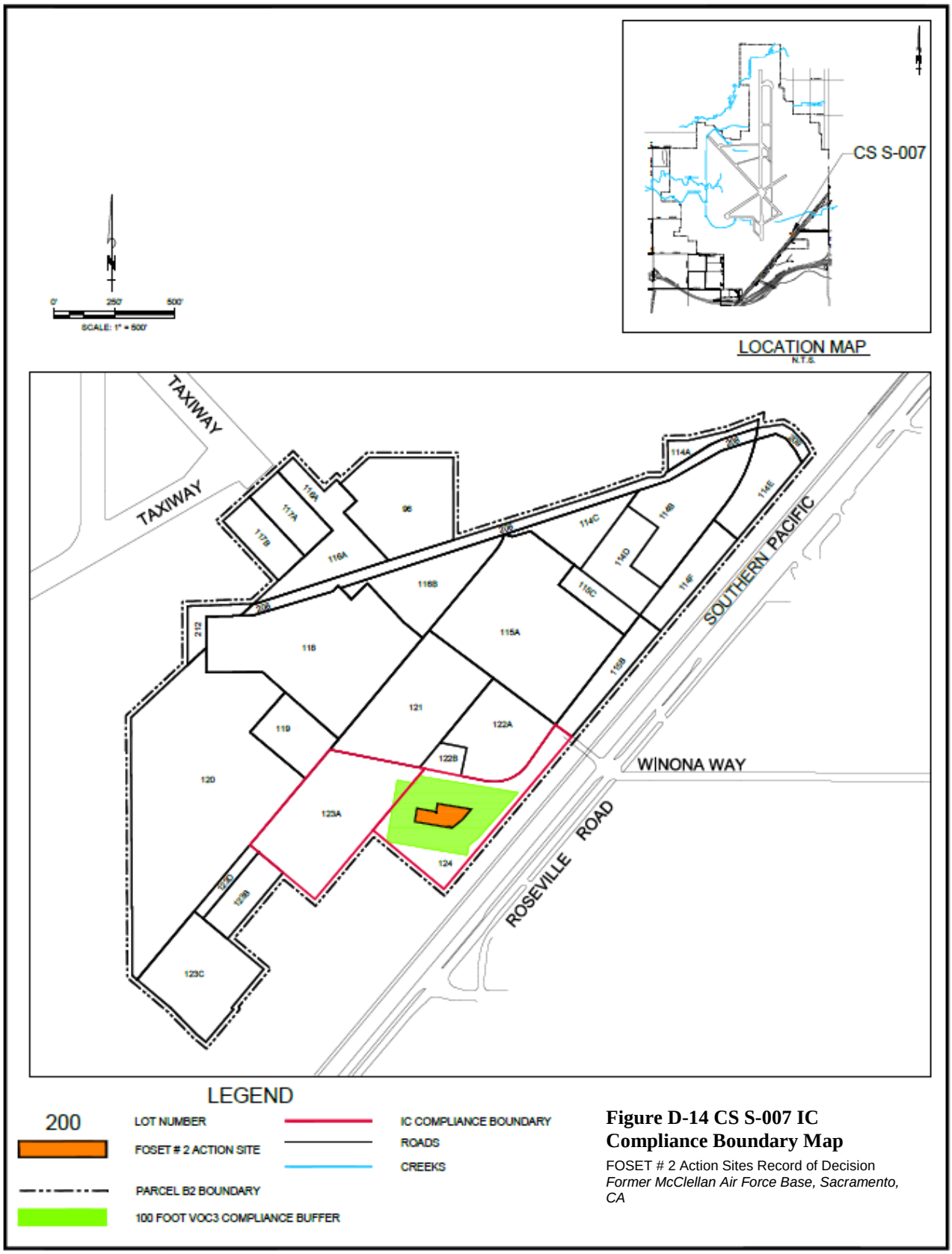

Figure D-14 CS S-007 IC Compliance Boundary Map

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Former McClellan Air Force Base, Sacramento, CA

CS S-024: This site covers approximately 2.1 acres and consisted of a concrete pad used for aircraft cleaning, two sumps that collected runoff from the aircraft washing operations, an unlined drainage ditch, Building 375 (which included aircraft washing, paint stripping, and fuel tank de-sealing), three paint remover ASTs and one solvent AST, Building 377 (support building), and Building 378 (chemical storage area). CS S-024 also includes a portion of Building 372 and the areas to the north and south of Building 375. Prior to 1959, CS S-024 was an unpaved area used for aircraft parking, where fuels and oils may have leaked or spilled on the ground surface. The pressure regulators associated with the paint removal ASTs reportedly leaked paint remover into the bermed areas, with a severe leak impacting the soil around the southeastern AST during the early 1980s. The ASTs have been removed; however, their removal date is uncertain. Wastewater produced at Building 375 was collected in four trench drains located in the middle of the building floor that discharged the wastewater into two sumps that were located on the southern end of the former concrete pad and on the southern side of Building 375. A bypass pipe that discharged directly to Magpie Creek was present in the southeastern sump, but was plugged with cement in 1985. Two trench drains were installed along the northern end of the washrack during the 1980s to collect stormwater runoff from the area to the north. An IWL, storm drain, and sanitary sewer inspection in 1998 (CBD/Dolver, 1998) indicated that broken and plugged pipes were present in the storm and IWL lines serving the washrack.

Selected Remedy: Alternatives VOC2 (ICs), Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; PCBs and TPH-G in soil

Shallow Soil Gas: Risks are within the risk management range for both unrestricted and restricted use. The carcinogenic risk for the residential scenarios ranges between 4×10^{-7} and 5×10^{-5}. For the occupational worker scenario, the carcinogenic risk ranges between 3×10^{-8} and 3×10^{-6}. The non-carcinogenic HIs for both the residential and the occupational worker scenarios are less than 1. Remedial Action is being taken because the extent of soil gas contamination to the north is uncertain. The eastern and central portions of CS S-024 are within the radius of the IC 30 SVE system. The COCs are TCE, ethylbenzene, PCE, and benzene.

Soil: Spills and releases from hazardous materials storage areas, solvent storage tanks, process work areas, media bulking locations, and transformers may have impacted the surface soil. Leaks from sumps, drains, and IWL and stormwater lines may have impacted the subsurface soil. Soil risks, driven by PCBs, are within the risk management range for unrestricted use, and within the risk management range for restricted use; however, the HI for unrestricted use exceeds 1. The carcinogenic risks for the residential and occupational worker scenarios are 3×10^{-5} and 4×10^{-6}, respectively. The non-carcinogenic HI for the residential scenario is 5, due to Aroclor-1260. The non-carcinogenic risk HI for the occupational worker scenario is less than 1. TPH-G exceeded the cleanup level for protection of groundwater quality. Aroclor-1260 was detected at concentrations greater than levels for protection of surface water quality. The COCs are Aroclor-1260 and TPH-G.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 7.0×10^{-6} and may be higher when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for CS S-024 is industrial. Alternatives VOC2 and Non-VOC4a were selected to address VOCs in SSG and to address non-VOC COCs in soil that pose a threat to surface water (Aroclor-1260) and groundwater quality (TPH-G). Although SSG risks are within the risk management range, the extent of soil gas contamination to the north is uncertain. VOC2 was selected due to this uncertainty. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit potential exposures to VOCs in SSG.

The industrial use target volume under Alternative Non-VOC4a of 320 cubic yards includes 140 cubic yards to address TPH-G that exceeds levels protective of groundwater quality and 180 cubic yards to address PCBs that exceed levels protective of surface water quality. The unrestricted use target volume of 320 cubic yards under Non-VOC4b was not selected because the future use for CS S-024 is industrial, there will be restrictions associated with VOC2, and due to the uncertainty in COC delineation. The ICs established by Alternative Non-VOC4a will restrict the sensitive uses of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

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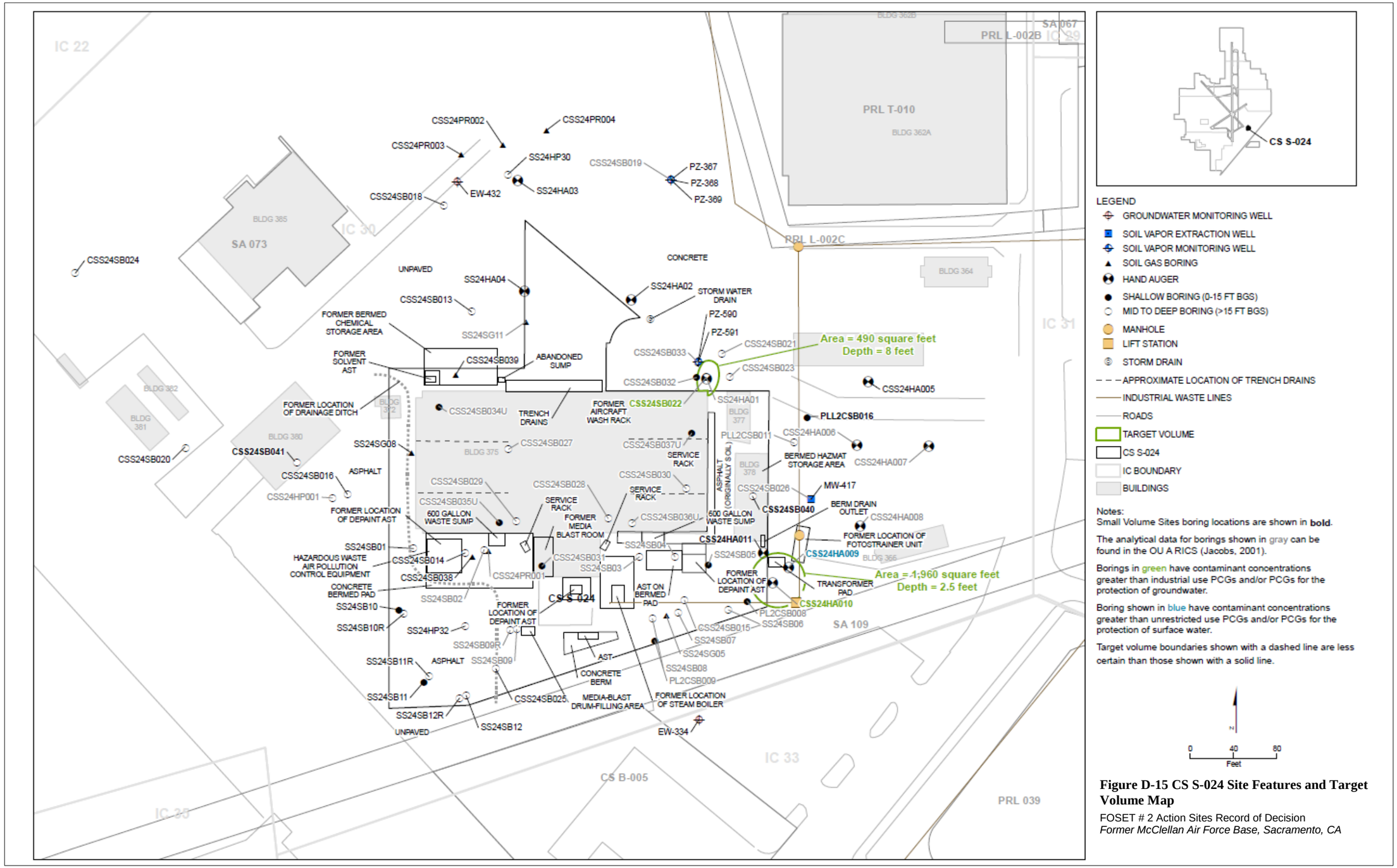

Figure D-15 CS S-024 Site Features and Target Volume Map

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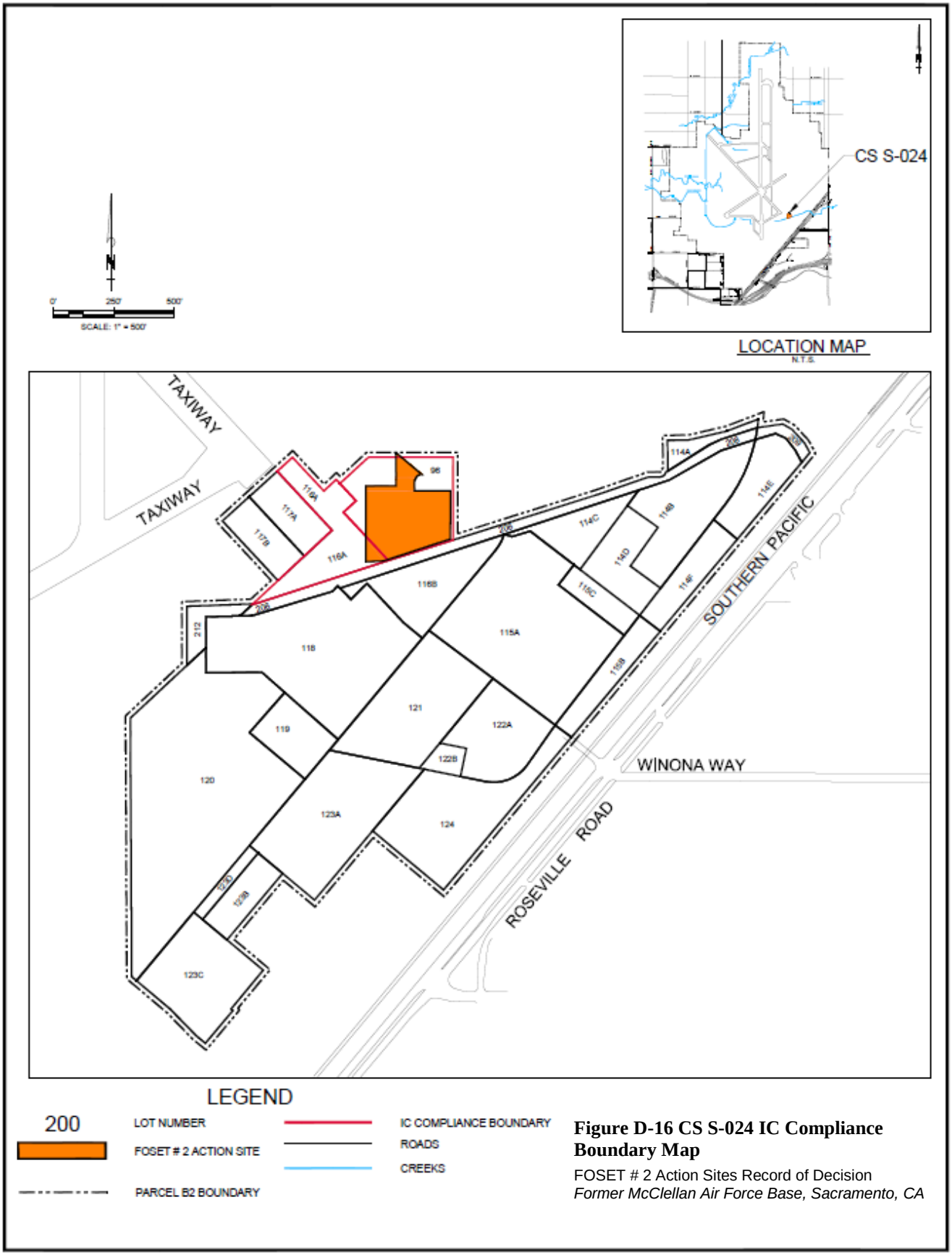


Figure D-16 CS S-024 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS S-026: This site consists of consists of Building 473 and the surrounding area. Building 473 was used for aircraft engine testing, and included a hazardous waste tank. A concrete basement contained high-pressure piping, sumps, drains, and tanks. Materials handled at CS S-026 included fuels, oils, VOCs, paints, heavy metals, aliphatic naphtha, toluene, and lead. Personnel interviews indicated that several spills and leaks occurred at Building 473 during its years of operation as an aircraft engine testing facility. Specifically, air blown through test cells containing oil and fuel was deposited onto the ground surface, and was washed into storm drains. The storm drains discharged into Magpie Creek. Additionally, approximately 1,000 gallons of oil spilled from leaking basement pipes over a 10- to 15-year period. Part of Building 473 was demolished in 1991 and the remaining sections demolished between May 2006 and September 2007.

Selected Remedy: Alternatives VOC3 (ICs/ECs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; TPH-D and TPH-G in soil

Shallow Soil Gas: Risks are greater than the risk management range for unrestricted use and within the risk management range for restricted use. The HI values for both use scenarios exceed 1. The cumulative sample-by-sample carcinogenic risks for the residential scenario range from 2×10^{-6} to 2×10^{-4} and total non-carcinogenic HIs range from less than 1 to 58. Carcinogenic risks for the occupational worker scenario range from 2×10^{-7} to 1×10^{-5} and non-carcinogenic HIs range from less than 1 to 4. CS S-026 is under the influence of the IC 37 SVE system. The COCs are hexachlorobutadiene, 1,2,4-TMB, 1,3,5-TMB, carbon tetrachloride, and PCE.

Soil: Releases from fuel handling and jet engine testing, spray booth operations, and other operations at Building 473 have impacted the site soil. Soil risks are within the risk management range for both unrestricted use and restricted use. The HI for unrestricted use is greater than 1. The carcinogenic risk is 9×10^{-5} for the residential scenario and 7×10^{-6} for the occupational worker scenario. The non-carcinogenic HI in soil for the residential scenario is 2, due to arsenic below revised background levels and cadmium, and the HI for the occupational worker scenario is less than 1. TPH-D and TPH-G exceeded cleanup levels for protection of groundwater quality. The COCs are TPH-D and TPH-G.

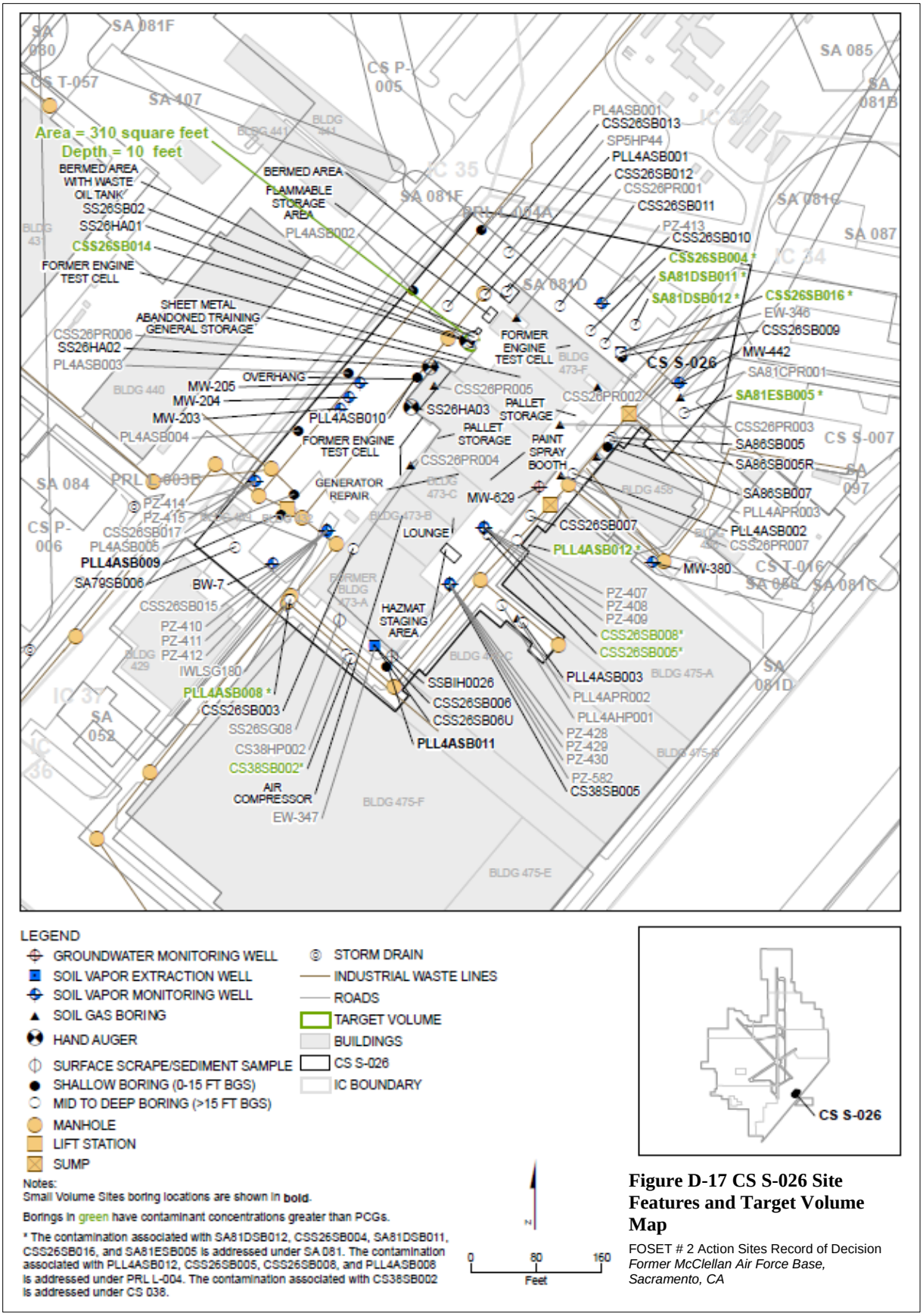
Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 1.7×10^{-5} and may exceed 10^{-4} when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for CS S-026 is industrial. Alternatives VOC3 and Non-VOC4a were selected to address VOCs in SSG that exceed the HI of 1 for industrial use and to address TPH-D and TPH-G in soil that pose a threat to groundwater quality. VOC3 was selected over VOC2 because the HI values for both unrestricted and industrial use exceed 1, and ICs alone will not be sufficient to protect workers. The ICs and ECs established by Alternative VOC3 will restrict the use of the site and require the installation of engineered controls in any future buildings or during significant remodeling of existing buildings to mitigate the potential for VOCs in SSG from migrating into buildings and impacting occupants via the vapor inhalation pathway. The parcel and lots affected by the IC compliance buffer for Alternative VOC3 are Parcel B2, Lots 118, 119, 120, 121, 121B, 123A, 123B, 123D, 124, and 125.

The industrial use target volume under Alternative Non-VOC4a is 120 cubic yards, and was selected to remove TPH-D and TPH-G in soil that exceed levels protective of groundwater quality. The unrestricted use target volume for Non-VOC4b is the same (120 cubic yards) because the excavation volume is based on the removal of soil for the protection of groundwater quality. Non-VOC4a was selected over Non-VOC4b because the future use for CS S-026 is industrial and because the ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or

significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.



LEGEND

- GROUNDWATER MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR MONITORING WELL
- SOIL GAS BORING
- HAND AUGER
- SURFACE SCRAPE/SEDIMENT SAMPLE
- SHALLOW BORING (0-15 FT BGS)
- MID TO DEEP BORING (>15 FT BGS)
- MANHOLE
- LIFT STATION
- SUMP
- STORM DRAIN
- INDUSTRIAL WASTE LINES
- ROADS
- TARGET VOLUME
- BUILDINGS
- CS S-026
- IC BOUNDARY

Notes:
Small Volume Sites boring locations are shown in **bold**.

Borings in green have contaminant concentrations greater than PCGs.

* The contamination associated with SA81DSB012, CSS26SB004, SA81DSB011, CSS26SB016, and SA81ESB005 is addressed under SA 081. The contamination associated with PLL4ASB012, CSS26SB005, CSS26SB008, and PLL4ASB008 is addressed under PRL L-004. The contamination associated with CS38SB002 is addressed under CS 038.

Figure D-17 CS S-026 Site Features and Target Volume Map

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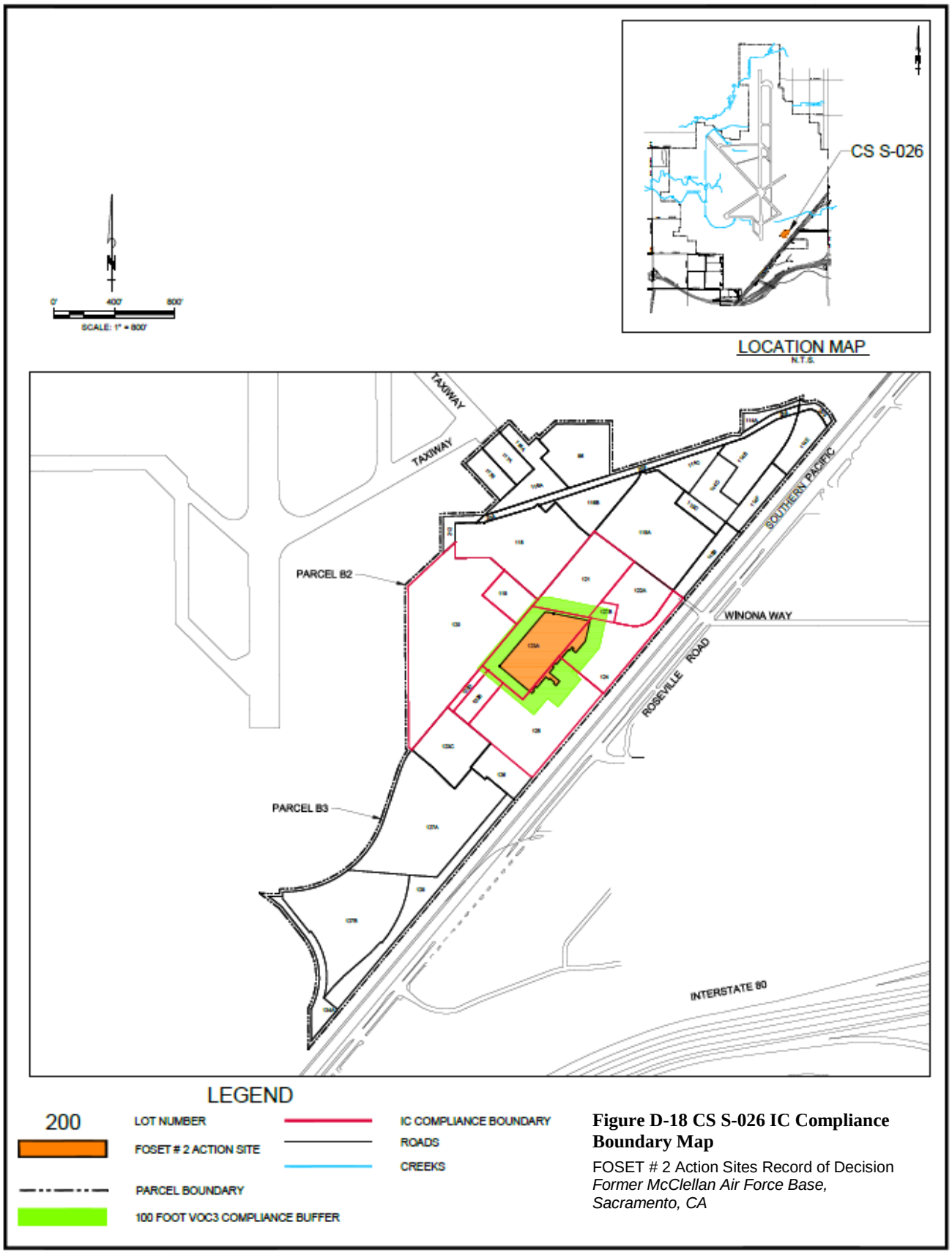


Figure D-18 CS S-026 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS T-012: This site is an approximately 5,000-square-foot area that was reportedly the location of a former oil-solvent UST, reportedly associated with Building 342. A geophysical anomaly identified in 1989 on the southern edge of Building 342 may be the tank related to CS T-012; however, this has not been confirmed. CS T-021 is adjacent to CS T-012; these sites were investigated together in the RICS and are addressed together in this ROD. The suspected UST at CS T-012 and the five removed USTs at CS T-021 have not been granted closure status.

Selected Remedy: Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: PAHs, TPH-D, and TPH-G in soil

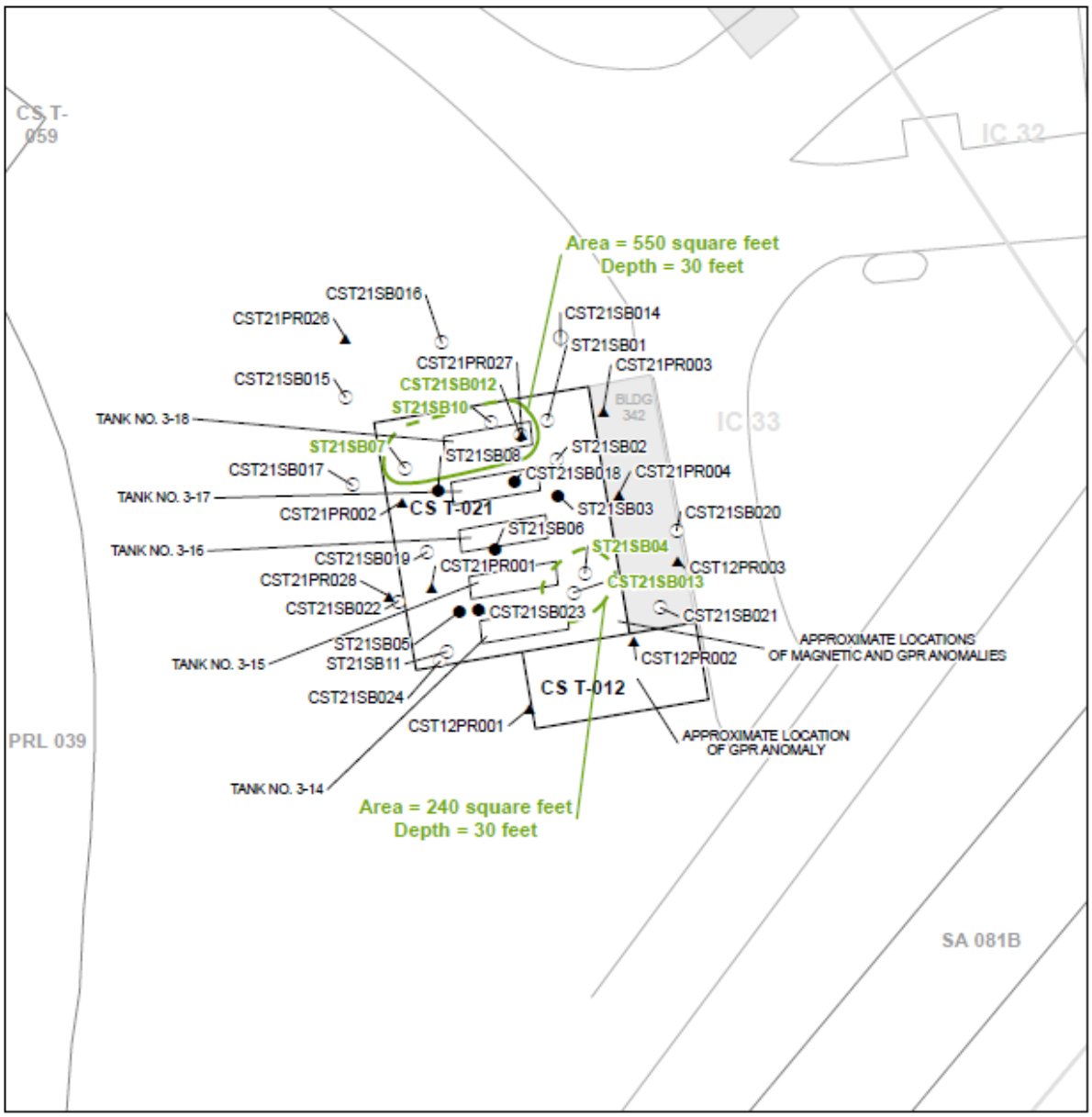
Shallow Soil Gas: No VOCs were detected in the SSG samples collected at CS T-012; therefore, no COCs were identified in SSG, and the SSG risk is below the risk management range for unrestricted use.

Soil: Leaks from the UST have impacted the subsurface soil. Soil risks, driven by PAHs, are within the risk management range for unrestricted use and at the low end of the risk management range for restricted use; however, the HI for unrestricted use is greater than 1. The carcinogenic risk is 9×10^{-6} for the residential scenario and 1×10^{-6} for the occupational worker scenario. The non-carcinogenic HI for the residential scenario is 3, due to thallium, and the HI for the occupational worker scenario is less than 1. TPH-D and TPH-G exceeded cleanup levels for protection of groundwater quality. The COCs are benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, TPH-D, and TPH-G.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified in SSG for CS T-012.

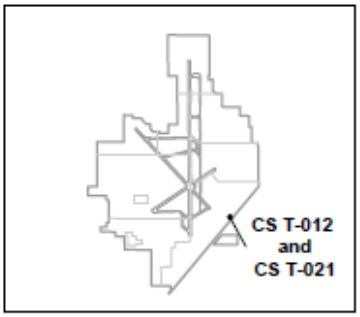
Rationale for Selected Remedies: The expected future use for CS T-012 is industrial. Alternative Non-VOC4a was selected to address TPH-D and TPH-G in soil that pose a threat to groundwater quality. The industrial use target volume (combined with CS T-021) under Alternative Non-VOC4a is 870 cubic yards, and was selected to remove TPH-D and TPH-G in soil that exceed levels protective of groundwater quality. The unrestricted use target volume under Non-VOC4b is the same (870 cubic yards) because the excavation volume is based on the removal of soil for the protection of groundwater quality. Non-VOC4a was selected over Non-VOC4b because the future use for CS T-012 and CS T-021 is industrial and because the ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.



LEGEND

- SOIL GAS BORING
- SURFACE SCRAPE/SEDIMENT SAMPLE
- SHALLOW BORING (0-15 FT BGS)
- MID TO DEEP BORING (>15 FT BGS)
- INDUSTRIAL WASTE LINES
- ROADS
- TARGET VOLUME
- BUILDINGS
- CS T-012 AND CS T-021
- IC BOUNDARY



Notes:
Borings in green have contaminant concentrations greater than PCGs.

Target volume boundaries shown with a dashed line are less certain than those shown with a solid line.

N

0 20 40
Feet

Figure D-19 CS T-012 and CS T-021 Site Features and Target Volume Map

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Former McClellan Air Force Base, Sacramento, CA

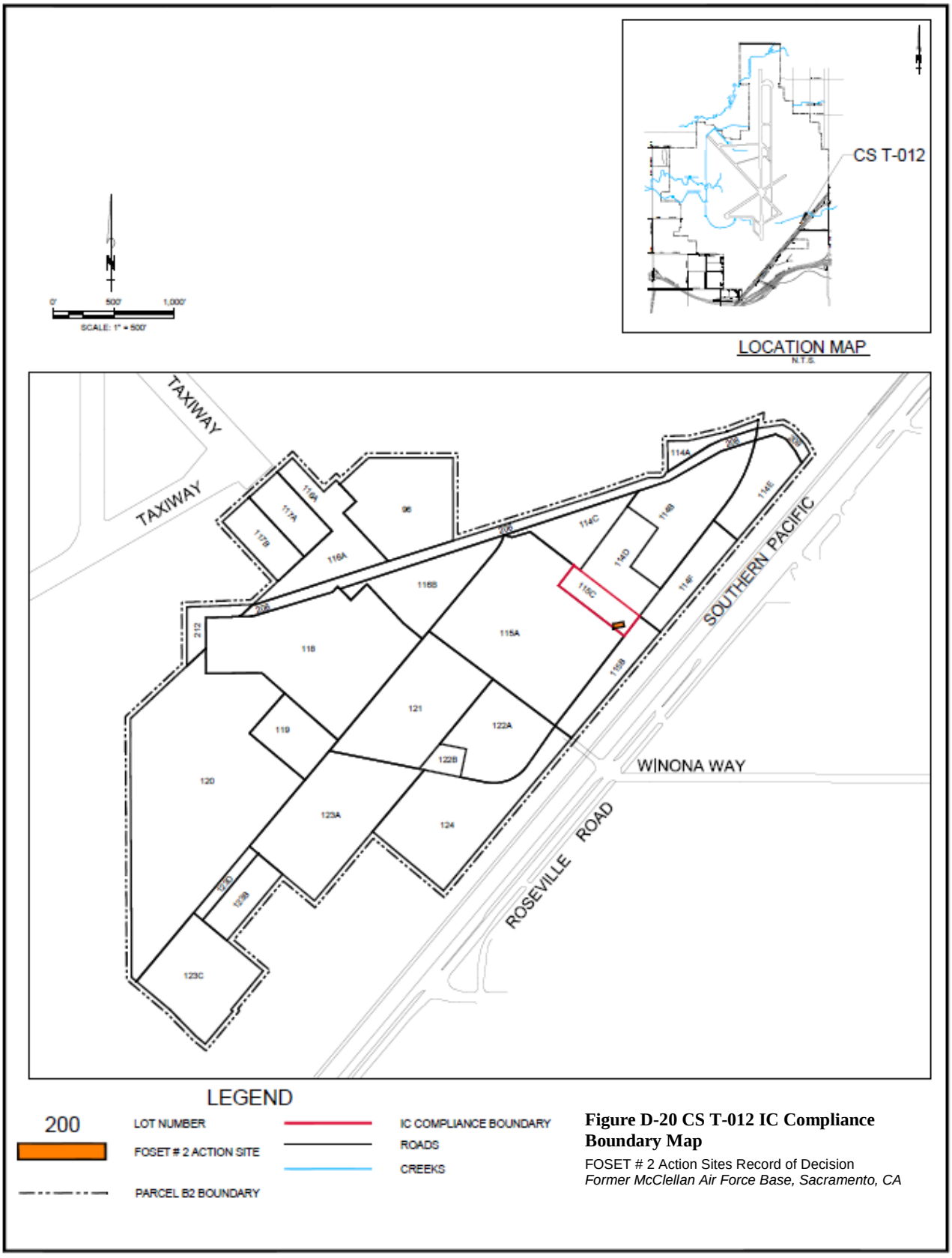


Figure D-20 CS T-012 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS T-016: This site is the former location of Tank Farm 2. This tank farm consisted of four 25,000-gallon USTs; one 12,000-gallon UST; and two ASTs. The 25,000-gallon tanks contained diesel or JP-4 jet fuel, and the 12,000-gallon tank contained waste fuel. The USTs were installed in 1938 and removed in 1992. Little information is available for the ASTs, but an assessment conducted in 1991 indicated they were labeled as containing jet fuel. Closure has not been granted for the USTs. A bioventing system operated at CS T-016 from 1993 until March 2005.

Selected Remedy: Alternatives VOC2 (ICs), Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; TPH-D and TPH-G in soil

Shallow Soil Gas: Risks are within the risk management range for unrestricted use and at the low end of the risk management range for restricted use. For the residential scenario, the carcinogenic risks range from 2×10^{-7} to 4×10^{-5}. For the occupational scenario, the carcinogenic risks from VOCs in soil gas range from 1×10^{-8} to 2×10^{-6}. The non-carcinogenic HIs are less than 1 for both scenarios. CS T-016 is also within the radius of influence of the IC 34 SVE system. Benzene was detected at a concentration greater than the industrial use screening level in one soil gas sample. The COCs are chloroform, naphthalene, ethylbenzene, and benzene.

Soil: Leaks from the ASTs and spills during fuel delivery may have impacted the surface soil. Leaks from the USTs and potentially contaminated soil used to backfill the UST excavations have impacted the subsurface soil. Soil risks, are at the high end of the risk management range for unrestricted use and within the risk management range for restricted use. The HI for unrestricted use is greater than 1. For the residential scenario, the carcinogenic risk is 1×10^{-4} and the non-carcinogenic HI is 2, due to arsenic. For the occupational scenario, the carcinogenic risk is 9×10^{-6} and the non-carcinogenic HI is less than 1. TPH-D and TPH-G exceeded cleanup levels for protection of the groundwater quality. There is also some uncertainty regarding the extent and current concentrations of TPH-D and TPH-G beneath the former USTs where elevated concentrations were previously detected. The COCs are TPH-D and TPH-G.

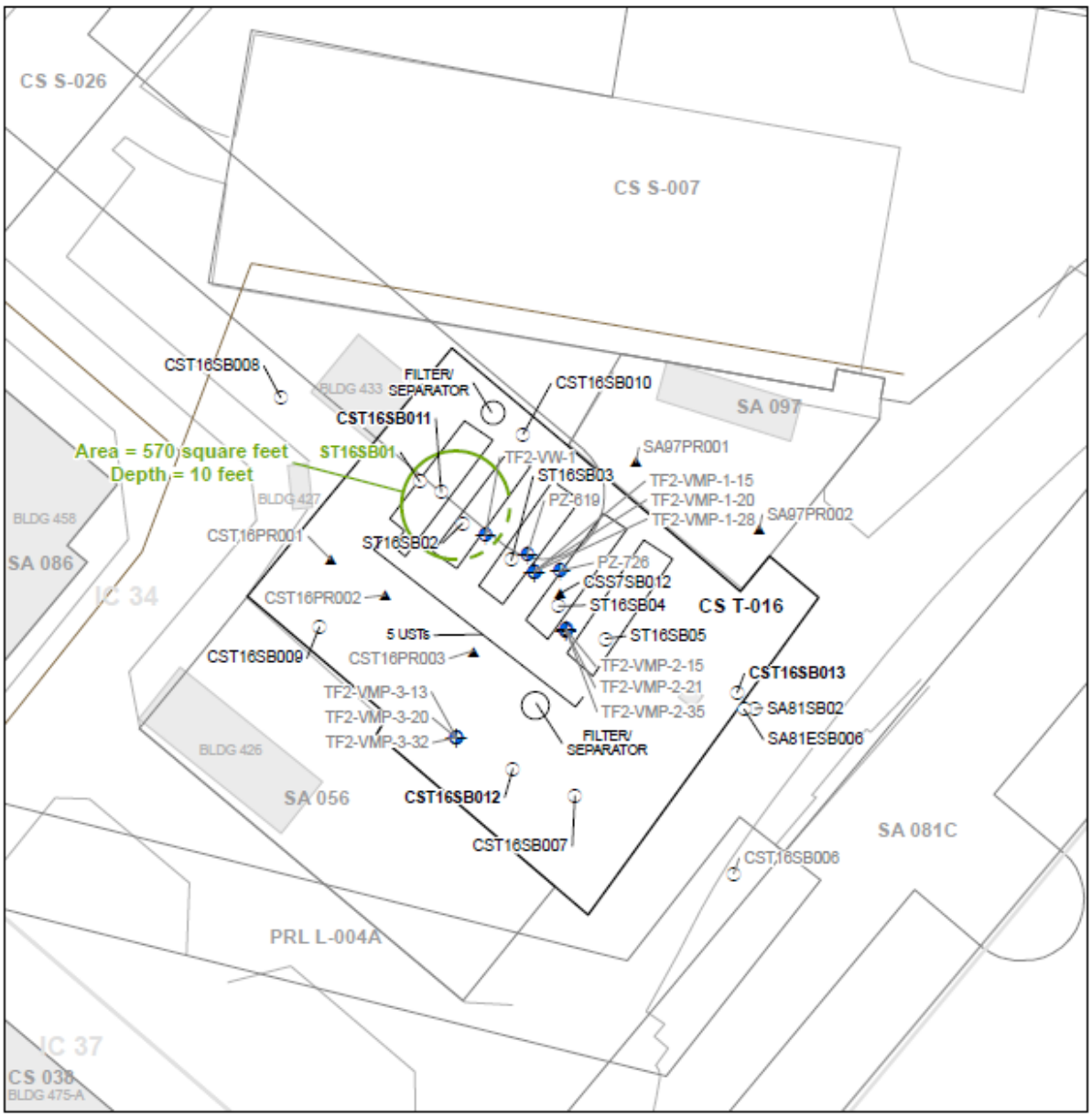
Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 1.1×10^{-5} and may exceed 10^{-4} when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for CS T-016 is industrial. Alternatives VOC2 and Non-VOC4a were selected to address VOCs in SSG and to address TPH-D and TPH-G in soil that pose a threat to groundwater quality. VOC2 was selected for this former tank farm due to uncertainty because the only shallow soil gas samples collected were analyzed using an older analytical method that has elevated detection limits. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit potential exposures to VOCs in SSG.

The industrial use target volume under Alternative Non-VOC4a is 210 cubic yards, and was selected to remove TPH-D and TPH-G in soil that exceed levels protective of groundwater quality. The unrestricted use target volume under Non-VOC4b is the same (210 cubic yards) because the excavation volume is based on the removal of soil for the protection of groundwater quality. There is some uncertainty regarding the extent and current concentrations of TPH-D and TPH-G beneath the former USTs. Non-VOC4a was selected over Non-VOC4b due to these uncertainties, the restrictions associated with VOC2, and the expected industrial reuse. Due to the lack of surface sampling, the existing surface cover(s) must be maintained by ECs. If the existing cover(s) are removed, sampling must be done, a surface cover must be maintained, or other ECs implemented, as warranted. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs

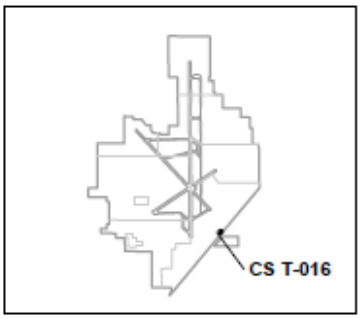
implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.



LEGEND

- SOIL VAPOR MONITORING WELL
- SOIL GAS SAMPLE
- MID TO DEEP BORING (>15 FT BGS)
- INDUSTRIAL WASTE LINES
- ROADS
- TARGET VOLUME
- CS T-016
- IC BOUNDARY
- BUILDINGS



Notes:
Small Volume Sites sample locations are shown in **bold**.

The analytical data for borings shown in gray can be found in the OU A RICS (Jacobs, 2001).

Borings in green have contaminant concentrations greater than PCGs.

Target volume boundaries shown with a dashed line are less certain than those shown with a solid line.

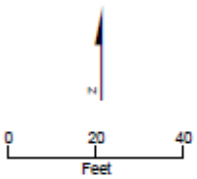


Figure D-21 CS T-016 Site Features and Target Volume Map

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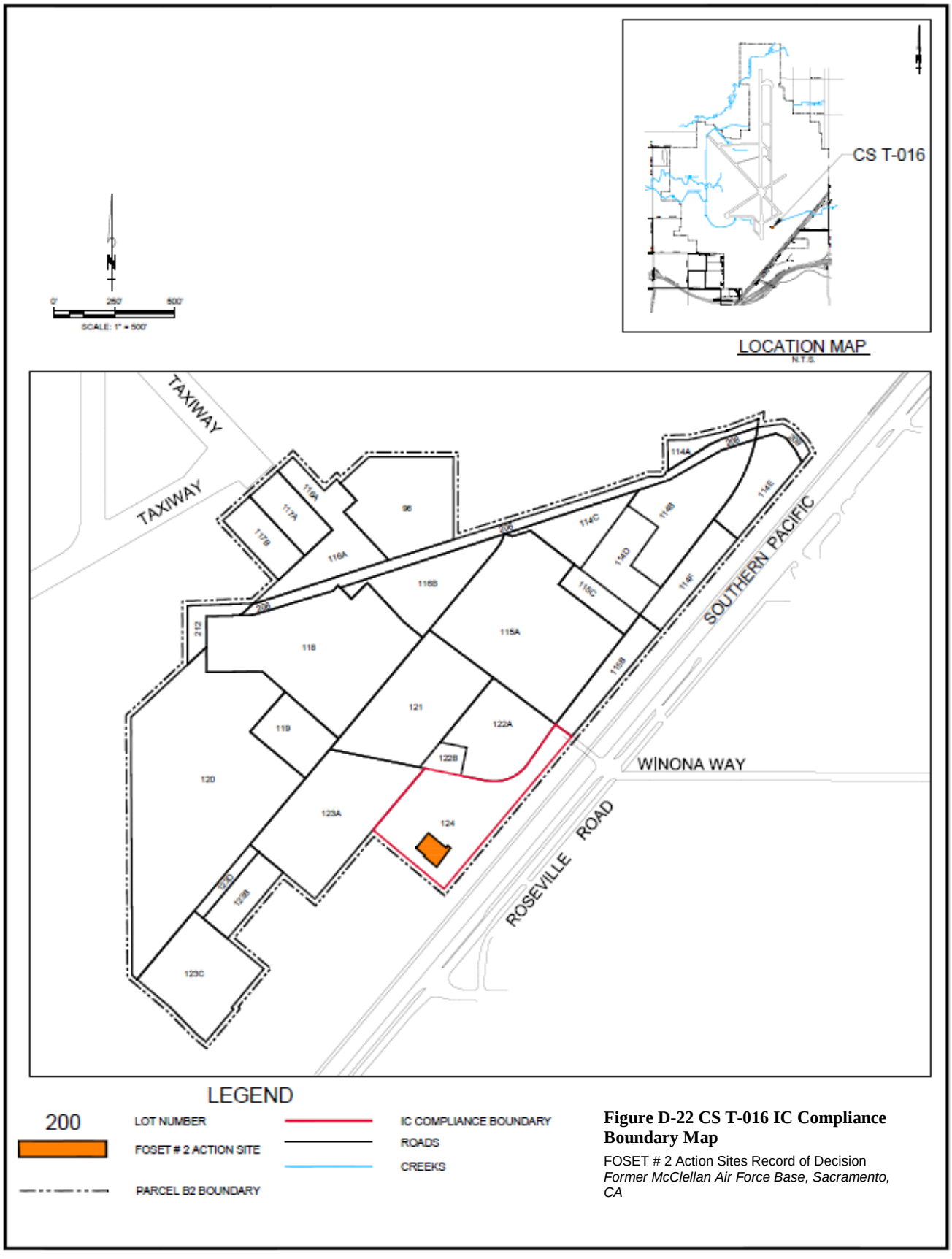


Figure D-22 CS T-016 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS T-017: This site encompasses the western portion of former Tank Farm 3, roughly 13,000 square feet in area. CS T-017 contained nine 25,000-gallon USTs. Six of the USTs were used to store No. 2 diesel fuel, and three were used to store aviation fuel and gear oil. The USTs have been removed, but have not been granted closure status.

Selected Remedy: Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: PAHs and TPH-G in soil

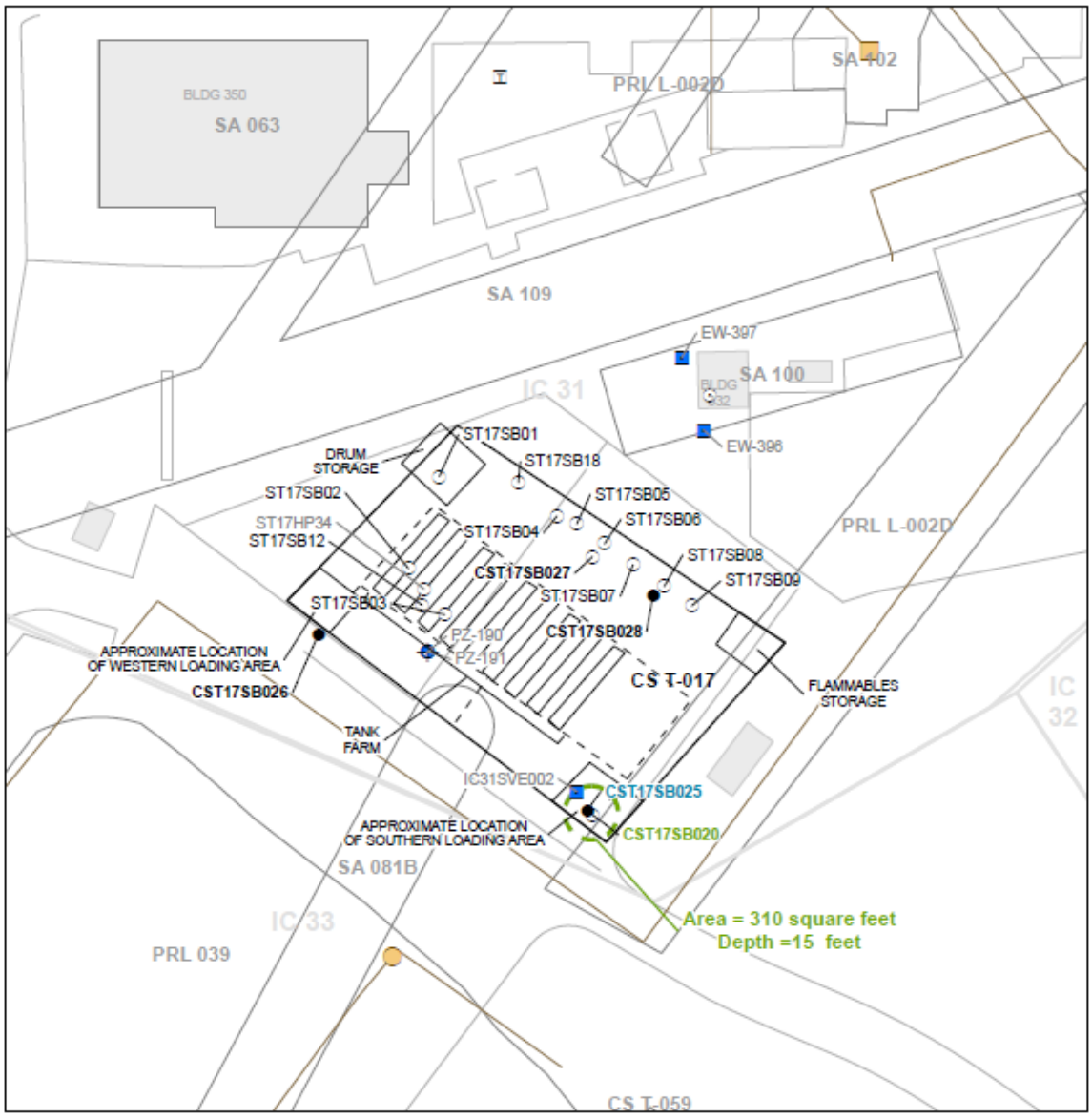
Shallow Soil Gas: Risks are within the risk management range for unrestricted use, and below the risk management range for restricted use. Carcinogenic risks for the residential scenario range from 1×10^{-6} to 1×10^{-5}, which is within the risk management range, and total non-carcinogenic HIs are less than 1. Carcinogenic risks for the occupational worker scenario are less than 1×10^{-6}, and the non-carcinogenic HI is less than 1. No COCs were identified in SSG because concentrations were relatively low, soil gas samples were collected from biased locations where contamination would likely have been identified, and a small number of VOCs exceeded screening levels. CS T-017 is also within the radius influence of the IC 31 SVE system.

Soil: Leaks from the USTs and associated piping have impacted the subsurface soil. Spills during unloading operations and from drum storage activities may have impacted the surface soil. Soil risks are at the high end of the risk management range for unrestricted use and within the risk management range for restricted use. The HI for unrestricted use exceeds 1. The carcinogenic risk for soil is 1×10^{-4} for the residential scenario and 1×10^{-5} for the occupational worker scenario. The HI for the residential scenario is 2, due to arsenic below the revised background level and is less than 1 for the occupational worker scenario. PAHs exceed the levels for protection of surface water quality. TPH-G exceeded the cleanup level for groundwater quality protection. The COCs are TPH-G, benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, and chrysene.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at CS T-017.

Rationale for Selected Remedies: The expected future use for CS T-017 is industrial. Alternative Non-VOC4a was selected to address PAHs and TPH-G in soil that pose a threat to surface water quality and groundwater quality, respectively. The industrial use target volume under Alternative Non-VOC4a is 170 cubic yards, and was selected to remove PAHs and TPH-G in soil that exceed levels protective of surface water and groundwater quality, respectively. The unrestricted use target volume for Non-VOC4b is the same (170 cubic yards) because the excavation volume is based on the removal of soil for the protection of surface water and groundwater quality. Based on limited surface samples, pre-excavation sampling is needed to confirm the excavation target volume and whether ECs are necessary to protect surface water quality. Due to these uncertainties and the intended industrial reuse of this site, Non-VOC4a was selected over Non-VOC4b. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.



LEGEND

- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR MONITORING WELL
- SHALLOW BORING (0-15 FT BGS)
- MID TO DEEP BORING (>15 FT BGS)
- MANHOLE
- LIFT STATION
- TRANSFORMER
- INDUSTRIAL WASTE LINES
- APPROXIMATE LOCATION OF FUEL LINES
- ROADS
- TARGET VOLUME
- CS T-017
- IC BOUNDARY
- BUILDINGS

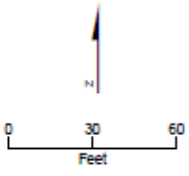
Notes:
Small Volume Sites boring locations are shown in **bold**.

The analytical data for borings shown in gray can be found in the OU A RICS (Jacobs, 2001).

Borings in green have contaminant concentrations greater than PCGs for the protection of groundwater.

Boring shown in blue have contaminant concentrations greater than unrestricted use PCGs and/or PCGs for the protection of surface water.

Target volume boundaries shown with a dashed line are less certain than those shown with a solid line.



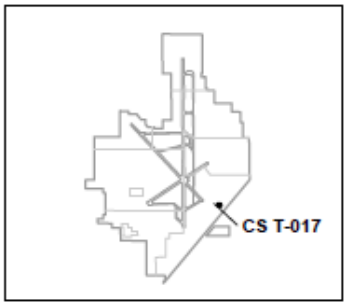


Figure D-23 CS T-017 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

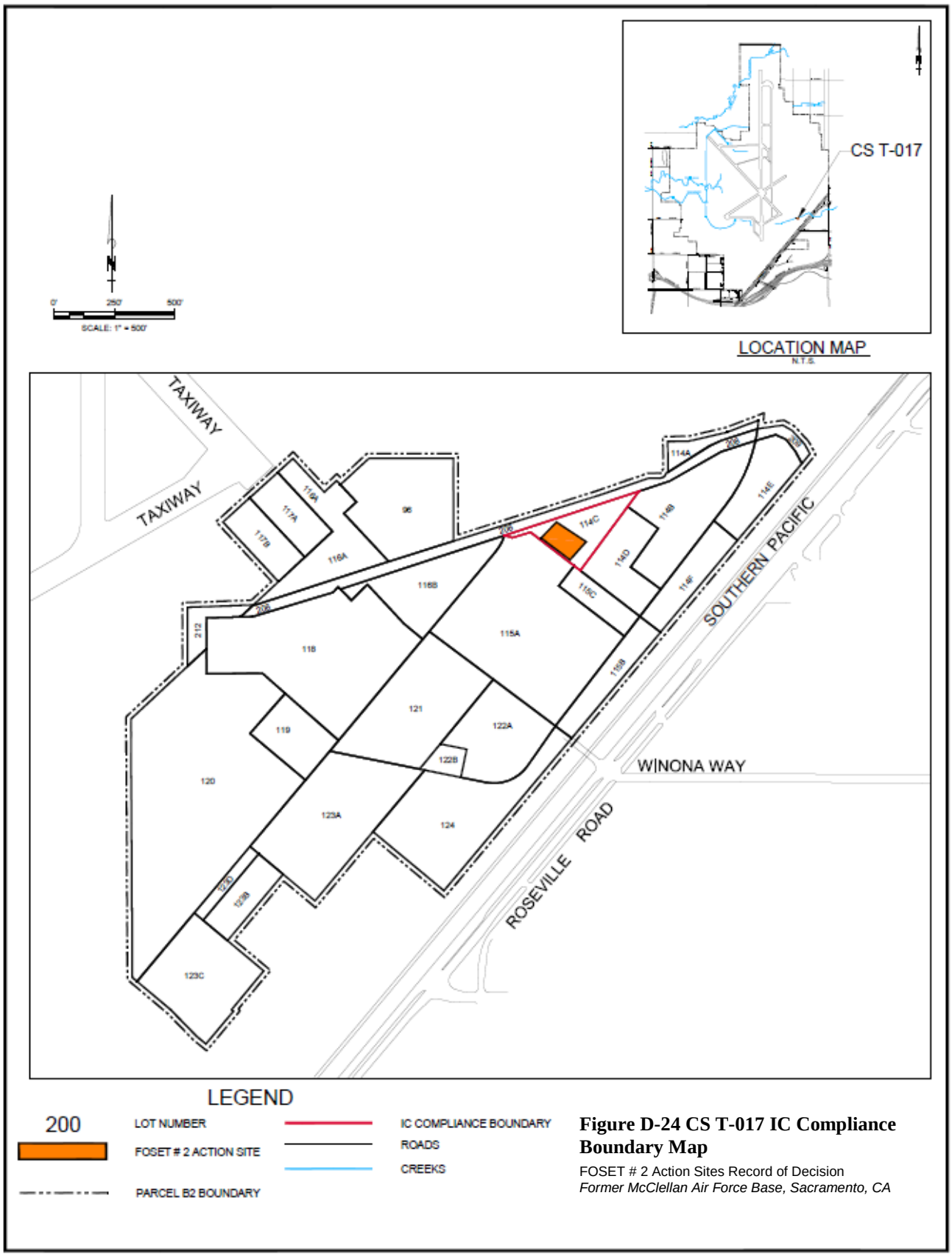


Figure D-24 CS T-017 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS T-020: This site covers approximately 10,000 square feet and includes the former location of Tank Farm No. 6 and the foundation of demolished Building 418 (a former pump house). Tank Farm No. 6 was composed of seven USTs that were installed between 1951 and 1955. The USTs stored liquid fuels and wastes, and ranged in capacity from 11,000 gallons to 27,000 gallons. All seven tanks were removed in 1990. No confirmation samples were collected when the tanks were removed, and the tanks have not been granted closure status.

Selected Remedy: Alternatives VOC3 (ICs/ECs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; TPH-D and TPH-G in soil

Shallow Soil Gas: Risks are at the low end of the risk management range for unrestricted use, and below the risk management range for restricted use. Based on a single sample collected from SA81ESB007, the estimated cumulative carcinogenic risk in soil gas is 3×10^{-6} for the residential scenario and is 2×10^{-7} for the occupational worker scenario. The non-carcinogenic HIs for both scenarios are less than 1. The COC is benzene. CS T-020 is within the radius of influence of the IC 37 SVE system.

Soil: The USTs contained a combination of solvents, waste solvents, gasoline, kerosene, alcohol, and diesel. All seven tanks were removed in 1990 along with impacted soil from UST and piping leaks, but the USTs have not been granted closure status. Soil risks are below the risk management range for unrestricted and restricted use; however, the HI for unrestricted use is greater than 1. The potential carcinogenic risk in soil is less than 1×10^{-6} for both the residential scenario and the occupational worker scenario. The non-carcinogenic HI in soil for the residential scenario is 5, due to thallium, and the HI for the occupational worker scenario is less than 1. The COCs are TPH-D and TPH-G. TPH-D and TPH-G exceeded cleanup levels for groundwater quality protection.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 2.1×10^{-7}, which is less than the risk management range.

Rationale for Selected Remedies: The expected future use for CS T-020 is industrial. Alternatives VOC3 and Non-VOC4a were selected to address VOCs in SSG and to address TPH-D and TPH-G in soil that pose a threat to groundwater quality. VOC3 was selected due to uncertainty. SSG was only sampled at a single location at CS T-020, which is insufficient to characterize a 10,000 square foot site. The ICs and ECs established by Alternative VOC3 will restrict the use of the site and require the installation of engineered controls in any future buildings or during significant remodeling of existing buildings to mitigate the potential for VOCs in SSG from migrating into buildings and impacting occupants via the vapor inhalation pathway. The parcel and lots affected by the IC compliance buffer for Alternative VOC3 are Parcel B3, Lots 125, 126, 127A, and 128. Because portions of the IC compliance buffer extend approximately 25 feet beyond the MBP property boundary, soil vapor sampling along the property boundary to evaluate the potential for off-site vapor intrusion is required.

The restricted use target volume under Alternative Non-VOC4a is 1,220 cubic yards, and was selected to remove TPH-D and TPH-G in soil that exceed levels protective of groundwater quality. The unrestricted use target volume for Non-VOC4b is the same (1,220 cubic yards) because the excavation volume is based on the removal of soil for the protection of groundwater quality. Non-VOC4b was not selected because the intended use is industrial and because of the restrictions associated with VOC3.

The ICs require that if existing buildings on the site are demolished or significantly remodeled or if the existing gravel surface cover is disturbed, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

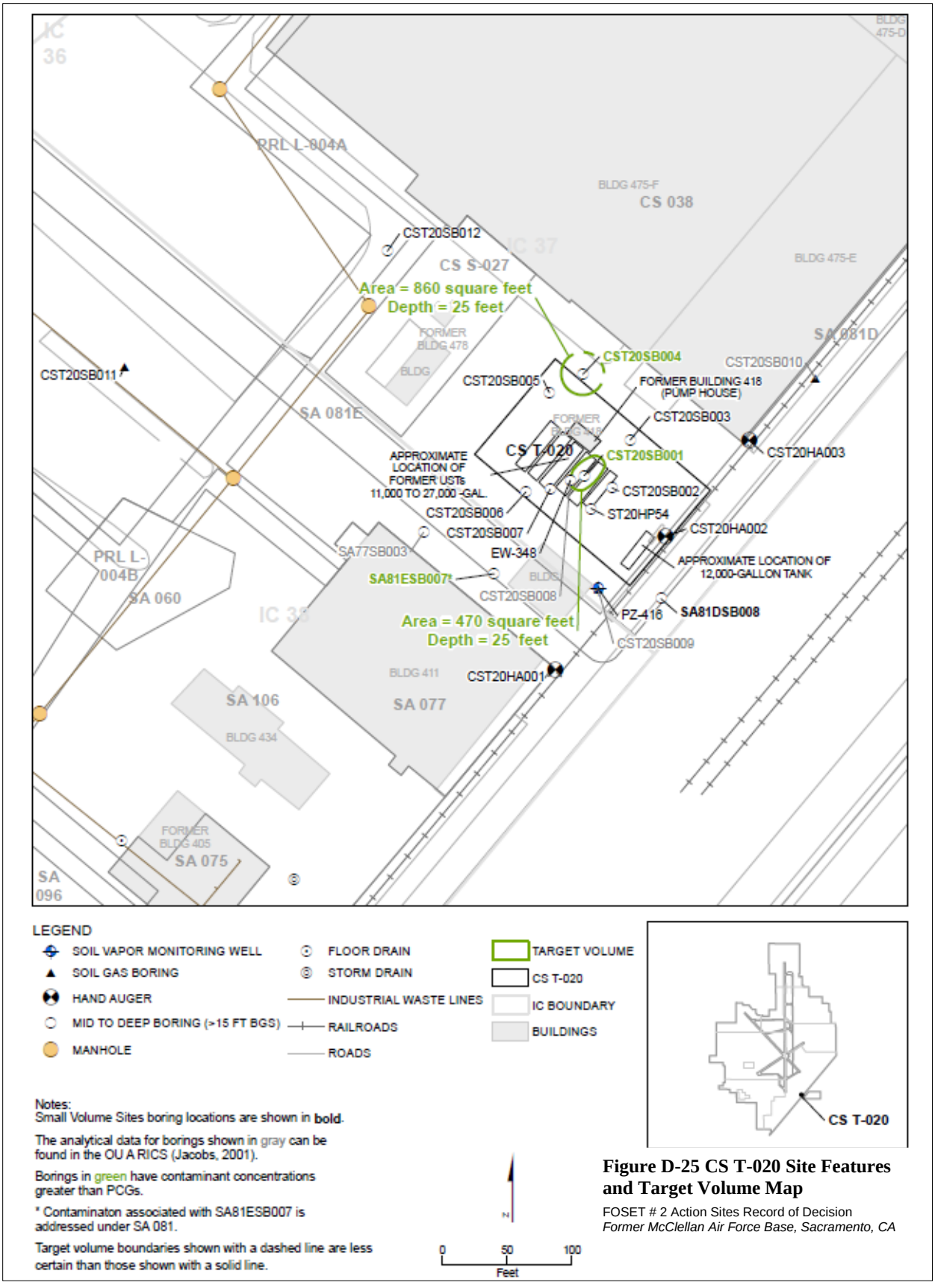


Figure D-25 CS T-020 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

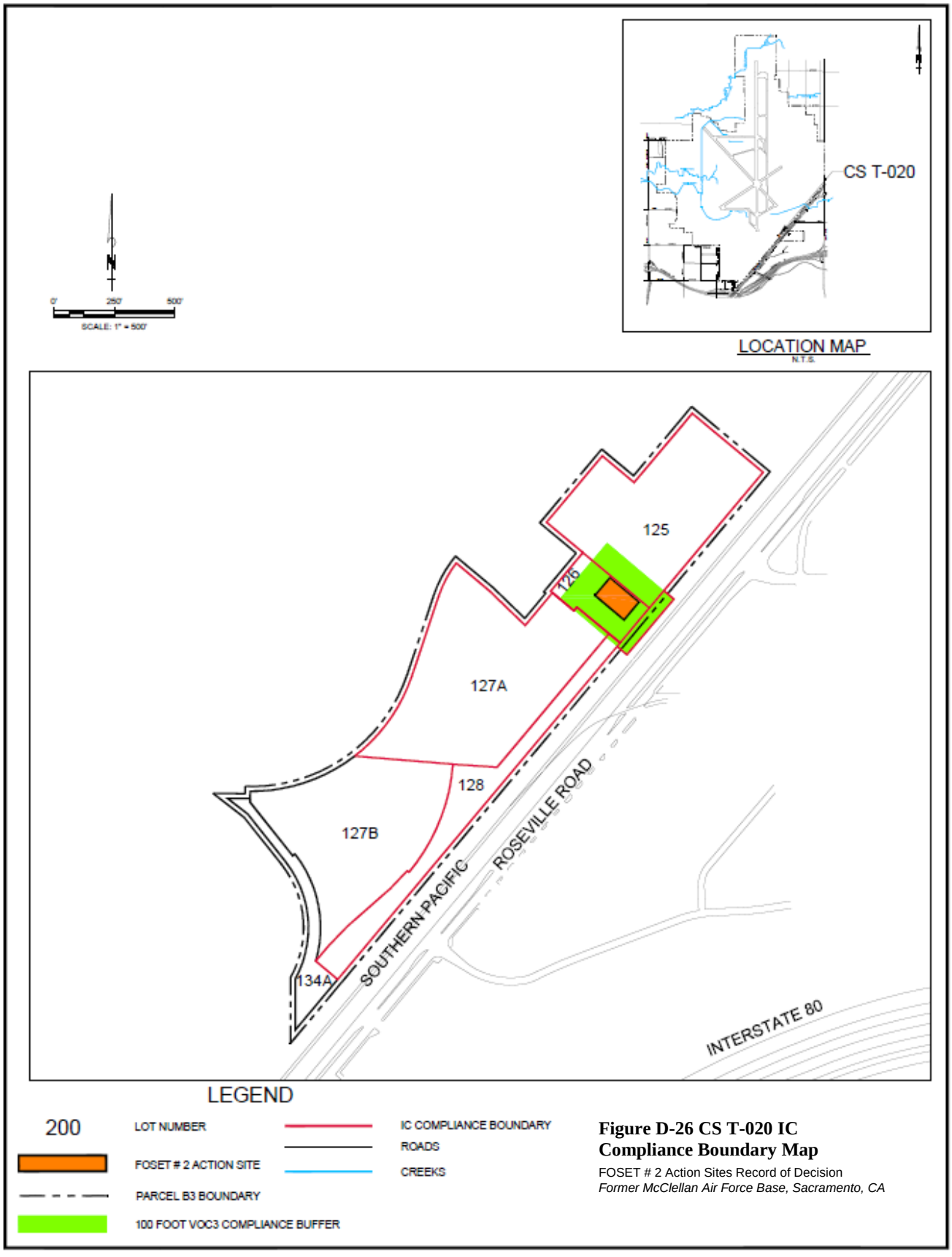


Figure D-26 CS T-020 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS T-021: This site is the location of former Tank Farm 3-East, which contained five 12,500-gallon USTs, containing oils and fuels, Stoddard solvent, and alcohol. CS T-012 is adjacent to CS T-021; these sites were investigated together in the RICS and are addressed together in this ROD. The suspected UST at CS T-012 and the five removed USTs at CS T-021 have not been granted closure status.

The tanks were removed in 1989, but have not been granted closure.

Selected Remedy: Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: PAHs, TPH-D, and TPH-G in soil

Shallow Soil Gas: No VOCs were detected in the SSG samples collected at CS T-021; therefore, no COCs were identified in SSG, and the SSG risk is below the risk management range for unrestricted use.

Soil: Leaks from the UST have impacted the subsurface soil. Soil risks, driven by PAHs, are at the low end of the risk management range for both unrestricted use and restricted use; however, the HI for unrestricted use exceeds 1. The carcinogenic risk is 9×10^{-6} from PAHs for the residential scenario and 1×10^{-6} for the occupational worker scenario. The non-carcinogenic HI for the residential scenario is 3, due to thallium, and the HI for the occupational worker scenario is less than 1. TPH-D and TPH-G exceeded cleanup levels for protection of groundwater quality. The COCs are benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, TPH-D, and TPH-G.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at CS T-021.

Rationale for Selected Remedies: The expected future use for CS T-021 is industrial. Alternative Non-VOC4a was selected to address TPH-D and TPH-G in soil that pose a threat to groundwater quality. The industrial use target volume (combined with CS T-012) under Alternative Non-VOC4a is 870 cubic yards, and was selected to remove TPH-D and TPH-G in soil that exceed levels protective of groundwater quality. The unrestricted use target volume under Non-VOC4b is the same (870 cubic yards) because the excavation volume is based on the removal of soil for the protection of groundwater quality. Non-VOC4a was selected over Non-VOC4b because the future use for CS T-012 and CS T-021 is industrial and because ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

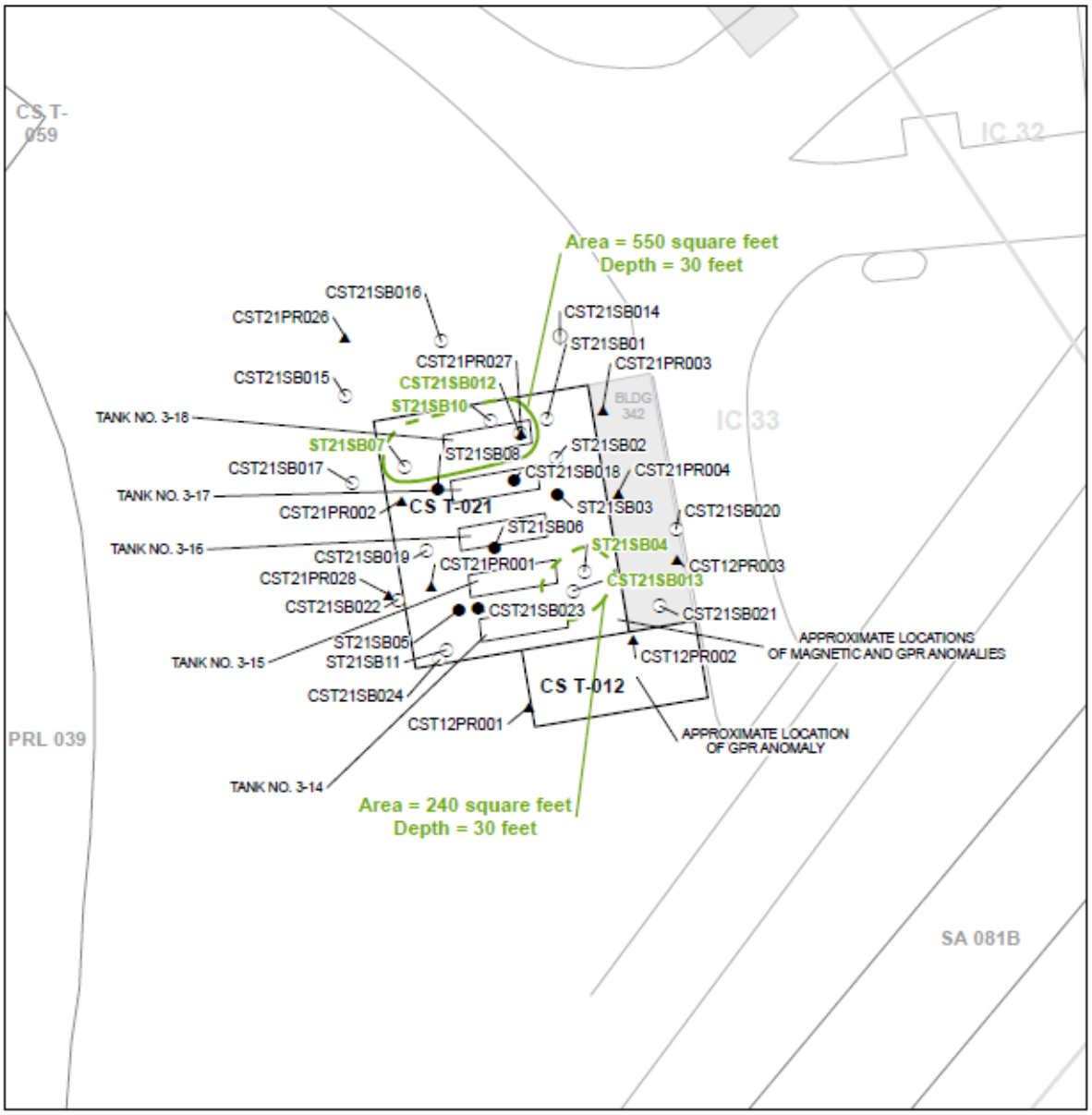


Figure D-27 CS T-012 and CS T-021 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

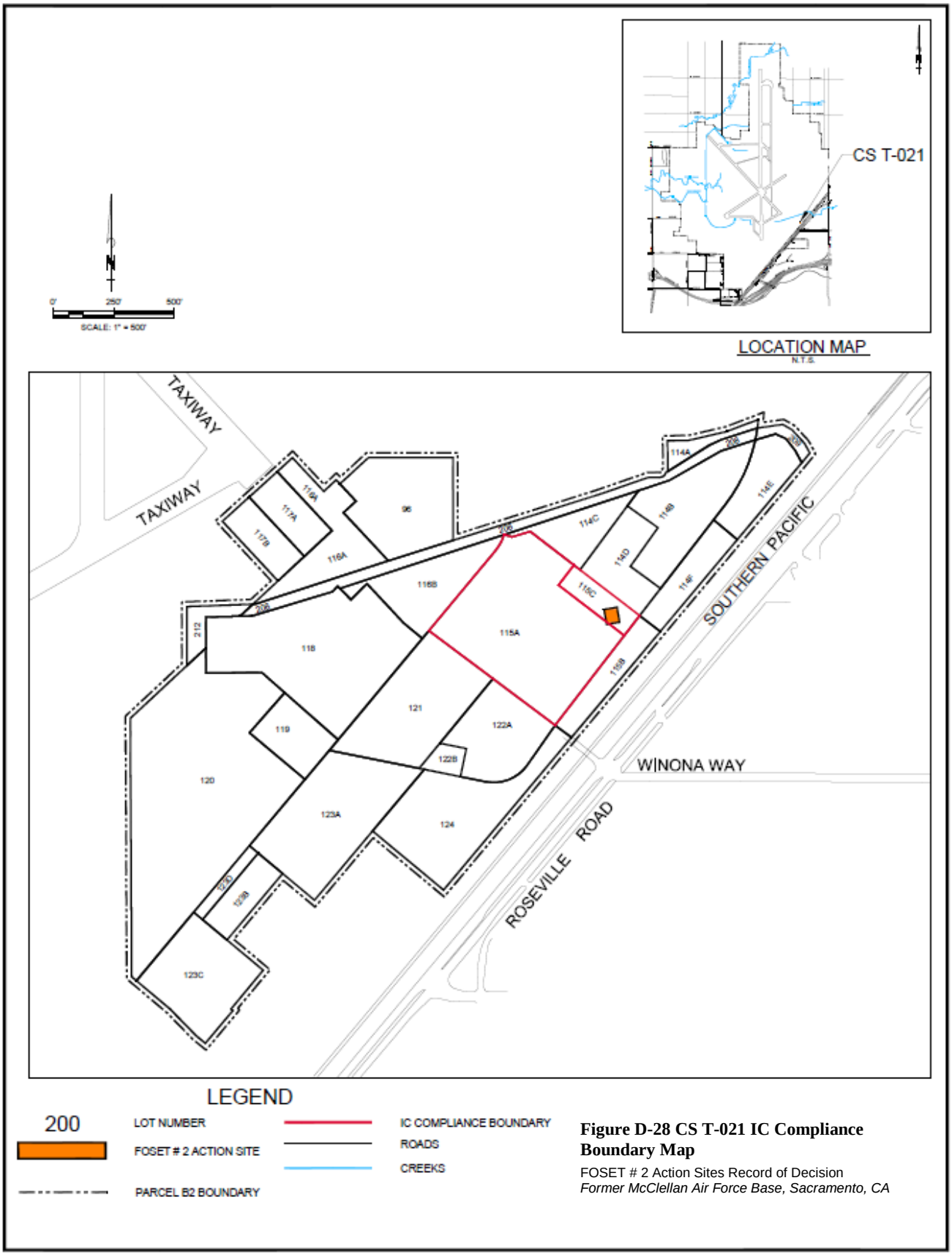


Figure D-28 CS T-021 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS T-030: This site consists of a group of six solvent USTs located immediately south of Building 252, ranging from 250 to 1,500 gallons, located immediately south of Building 252. In 1990, two of the USTs were removed and the other four were reported to have been filled with concrete and abandoned in place. When this area was excavated in 2013, the USTs were found to contain dirt, water, gravel, and residual product. The USTs were removed in 2013, but closure has not been granted.

Selected Remedy: Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: Mercury and PAHs in soil

Shallow Soil Gas: Risks are below the risk management range for unrestricted and restricted use. No COCs have been identified.

Soil: Leaks from the USTs have impacted the subsurface soil. Soil risks, driven by mercury, are within than the risk management range for both unrestricted and restricted use. The HI values for both use scenarios are greater than 1. The carcinogenic risk is 2×10^{-5} with a HI of 575, due to mercury for the residential scenario and 3×10^{-6} with an HI of 13, due to mercury for the occupational worker scenario. Mercury was detected at concentrations greater than the levels for protection of surface water and groundwater quality. PAHs were detected below the USTs when they were removed during the SVS and Building 252 Radiological NTCRA; the extent of PAHs above levels protective of groundwater quality has not been delineated, so PAHs were added as a COC. The COCs are mercury and PAHs. It should be noted that Ra-226 was previously a soil COC at CS T-030; however, Ra-226 contamination was removed during the SVS and Building 252 Radiological NTCRA and is no longer a COC for CS T-030. A total of 3,132 cubic yards of contaminated soil, asphalt, and concrete were removed.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at CS T-030.

Rationale for Selected Remedies: The expected future use for CS T-030 is industrial. Alternative Non-VOC4a was selected to address mercury in soil that exceeds the HI of 1 for industrial use and poses a threat to both surface water and groundwater quality. Also, based on information in the RAR, the extent of PAHs that were detected below the USTs has not been delineated. The industrial use target volume (combined with PRL S-018) under Alternative Non-VOC4a is 3,243 cubic yards, and was selected to remove mercury in soil that exceed the industrial cleanup levels and levels protective of both surface water and groundwater quality. The RAR for CS T-030 did not sufficiently document that contamination was removed. If contamination is found when delineation sampling is done for the remaining contaminated soil, the backfill placed when the SVS and Building 252 Radiological NTCRA was completed will be removed and stockpiled for use in backfilling the excavations associated with the selected remedy. If the delineation samples indicate that contamination has been addressed, additional excavation will not be necessary. The unrestricted use target volume under Non-VOC4b is 3,257 cubic yards), but was not selected because the future use for CS T-030 and PRL S-018 is industrial. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that the existing surface cover must be maintained, sampling must be done, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality shown in Table 2-4 are exceeded.

The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

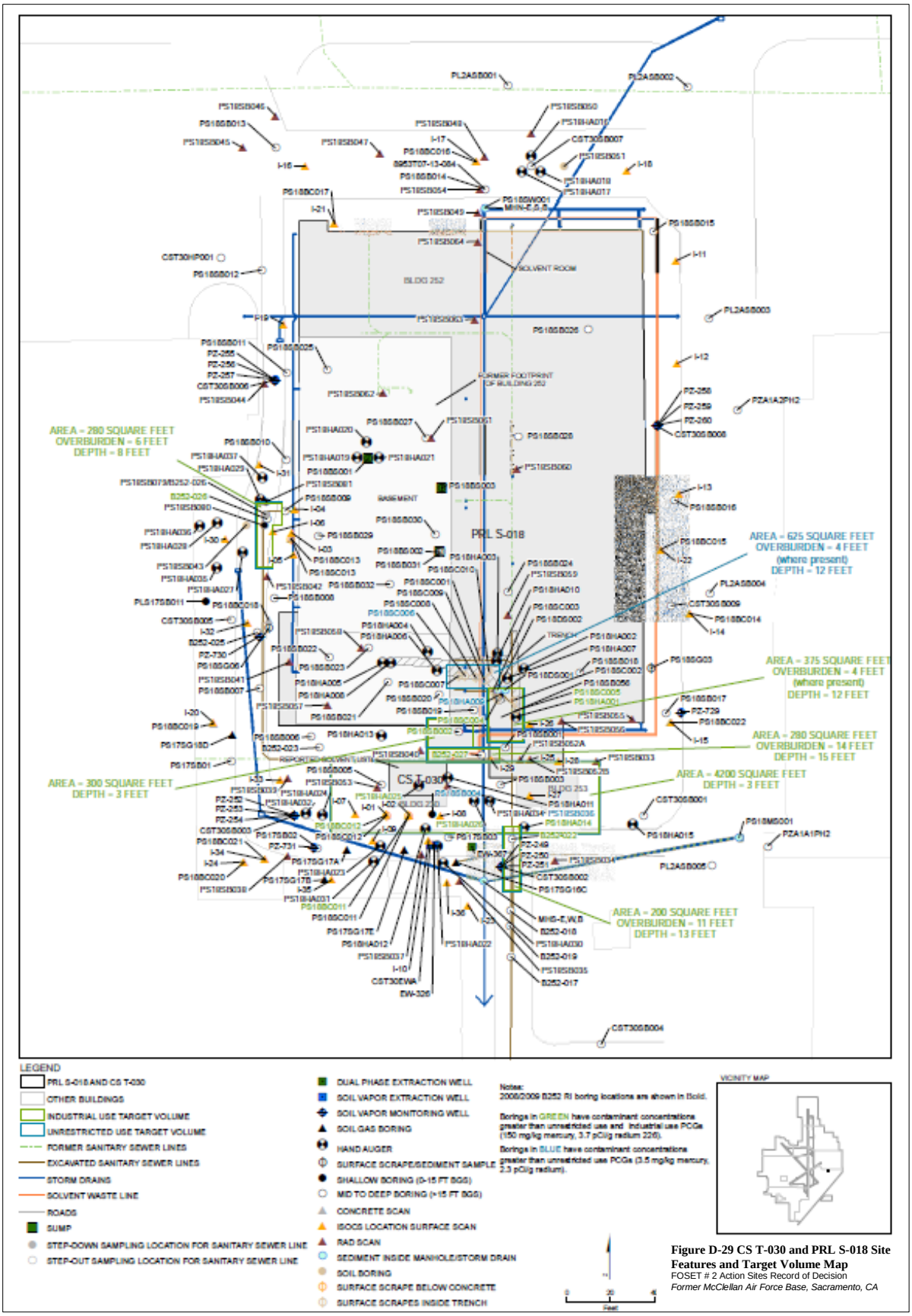


Figure D-29 CS T-030 and PRL S-018 Site Features and Target Volume Map
FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

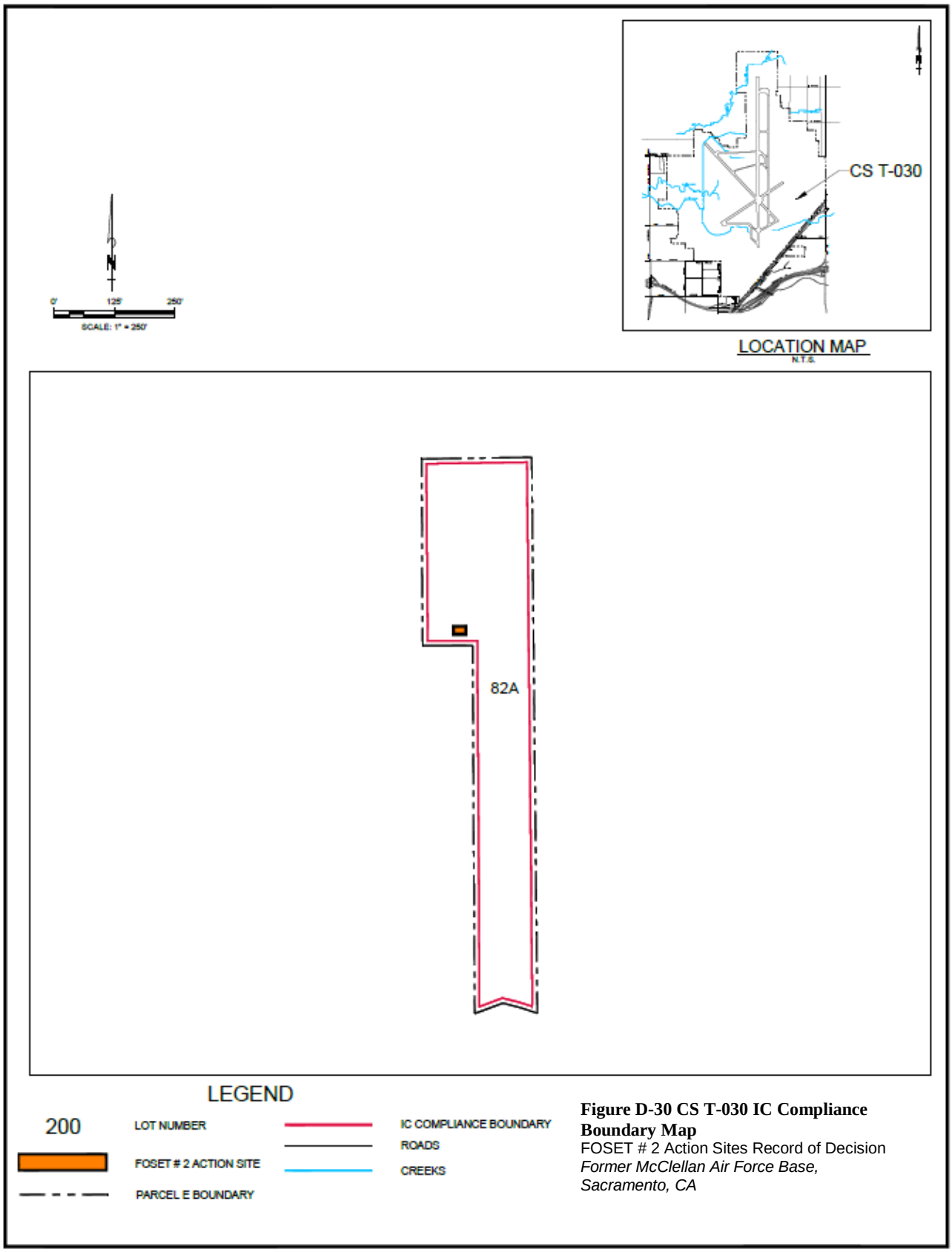


Figure D-30 CS T-030 IC Compliance Boundary Map
FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS T-036: This 60 square foot site consists of the location of former UST 344, a 500-gallon steel UST used to store Stoddard solvent adjacent to the northwest corner of Building 344. It was reported in previous investigations that unknown substances (possibly pesticides) may have been dumped in the tank after it was drained in 1987. Surface releases during dumping may have also occurred. The tank was removed in 1989. The excavation was filled with clean soil and paved over. Soil samples concluded that the soil within the excavation was not contaminated, and UST 344 was listed as NFA by the Central Valley Water Board. Currently, CS T-036 consists of a paved area.

Selected Remedy: Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: Dieldrin in soil

Shallow Soil Gas: Risks are below the risk management range for unrestricted and restricted use. The carcinogenic risks for the residential scenario range from 5×10^{-7} to 6×10^{-7}. Carcinogenic risks for the occupational worker scenario are 3×10^{-8}. Total non-carcinogenic HIs for both scenarios are less than 1. CS T-036 is under the influence of the IC 31 SVE system. No COCs have been identified.

Soil: Soil samples concluded that the soil within the excavation was not contaminated, and UST 344 was granted closure status by the Central Valley Water Board. Soil risks, driven by pesticides, are at the upper end of the risk management range for unrestricted use and within the risk management range for restricted use. The carcinogenic risk is 1.4×10^{-4} for the residential scenario and 8×10^{-6} for the occupational worker scenario. The non-carcinogenic HIs for both scenarios are less than 1. The COC is dieldrin.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at CS T-036.

Rationale for Selected Remedies: The expected future use for CS T-036 is industrial. Alternative Non-VOC4a was selected to address dieldrin in soil that exceeds industrial soil cleanup levels. The industrial use target volume under Alternative Non-VOC4a is 110 cubic yards. The unrestricted use target volume under Non-VOC4b is the same (110 cubic yards). Non-VOC4a was selected over Non-VOC4b because the future use for CS T-036 is industrial and ICs are needed to prohibit sensitive reuse. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

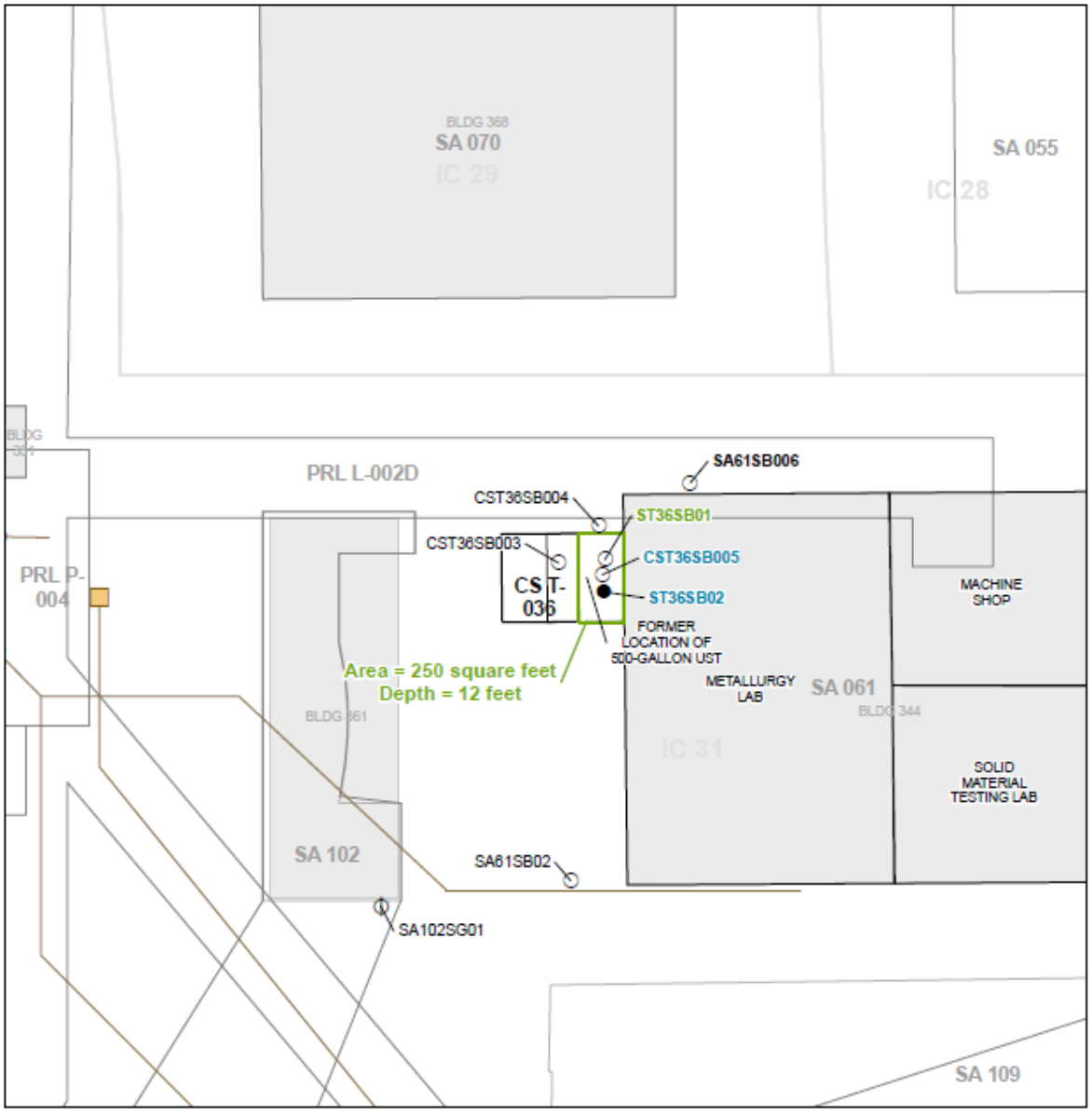


Figure D-31 CS T-036 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

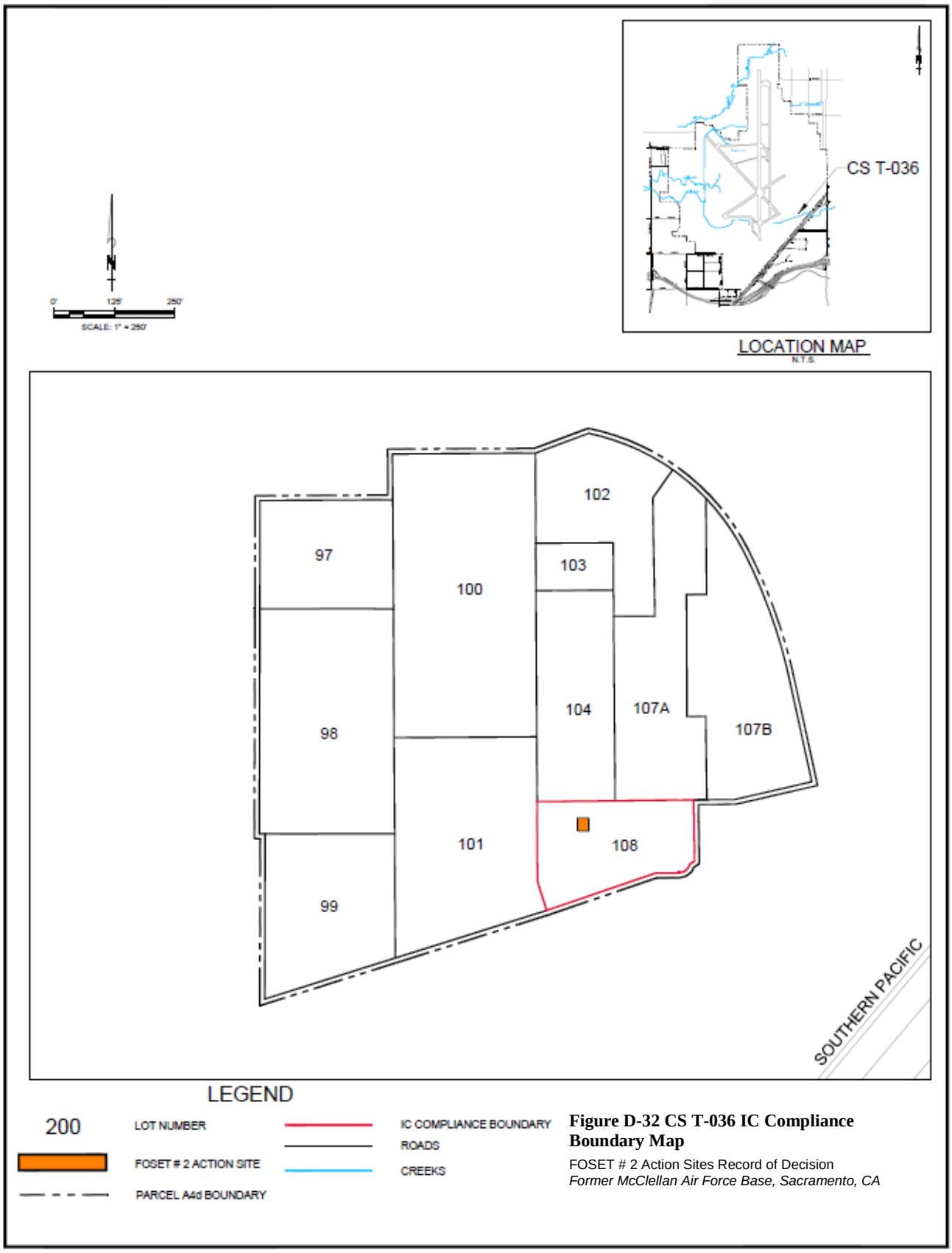


Figure D-32 CS T-036 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS T-047: This 2,400 square foot site is adjacent to Building 346 and is the location of a former underground OWS and an associated 10,000-gallon AST. The OWS was installed at IWTP #1 in 1960 and used as a flow-through system to treat discharge from IWTP #1 until 1963, when the AST was constructed. The collected oil was reportedly disposed of in burn pits until 1964. After 1964, oil was stored in the AST until it was hauled off for disposal by independent contractors. The OU A IWTP was constructed in 1972, and the OWS was disconnected from IWTP #1. The OWS was then used for treatment of oil and other liquid wastes collected in tanker trucks from other areas at McClellan. In 1986, the OWS was temporarily removed from service after contamination was discovered during the repair of a waterline in a 6-foot-deep excavation near the northern corner of the site. The OWS was drained and inspected, and cracks were observed in the concrete walls. The AST was demolished in the early 1990s, and the OWS was removed in 1994. No soil was reportedly removed. The OWS has not been granted NFA status by the Central Valley Water Board.

Selected Remedy: Alternatives VOC2 (ICs), Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; naphthalene, 2-methylnaphthalene, TPH-D, and TPH-G in soil

Shallow Soil Gas: Risks are greater than the risk management range for unrestricted use but within the risk management range for restricted use. The HI for unrestricted use is greater than 1. The cumulative sample-by-sample carcinogenic risks for the residential scenario range from 6×10^{-6} to 3×10^{-4} and total non-carcinogenic HIs range from less than 1 to 5. Carcinogenic risks for the occupational worker scenario range from less than 4×10^{-7} to 2×10^{-5}, and non-carcinogenic HIs are less than 1. The COCs are benzene, 1,1-DCA, chloroform, cis-1,2-DCE, vinyl chloride, TCE, and PCE.

Soil: Releases resulting from leaks in the OWS and associated piping have impacted the subsurface soil. Releases resulting from leaks in the AST or when waste oil was removed from it may have impacted the surface soil. Soil risks, driven by naphthalene and 2-methylnaphthalene in a single sample, are within the risk management range for unrestricted use and at the low end of the risk management range for restricted use. The HI for unrestricted use exceeds 1. The carcinogenic risk is 5×10^{-6} for the residential scenario and 2×10^{-6} for the occupational worker scenario. The non-carcinogenic HI for the residential scenario is 2, due to 2-methylnaphthalene, and the HI for the occupational worker scenario is less than 1. TPH-D and TPH-G exceeded cleanup levels for protection of groundwater quality. The COCs are naphthalene, 2-methylnaphthalene, TPH-D, and TPH-G.

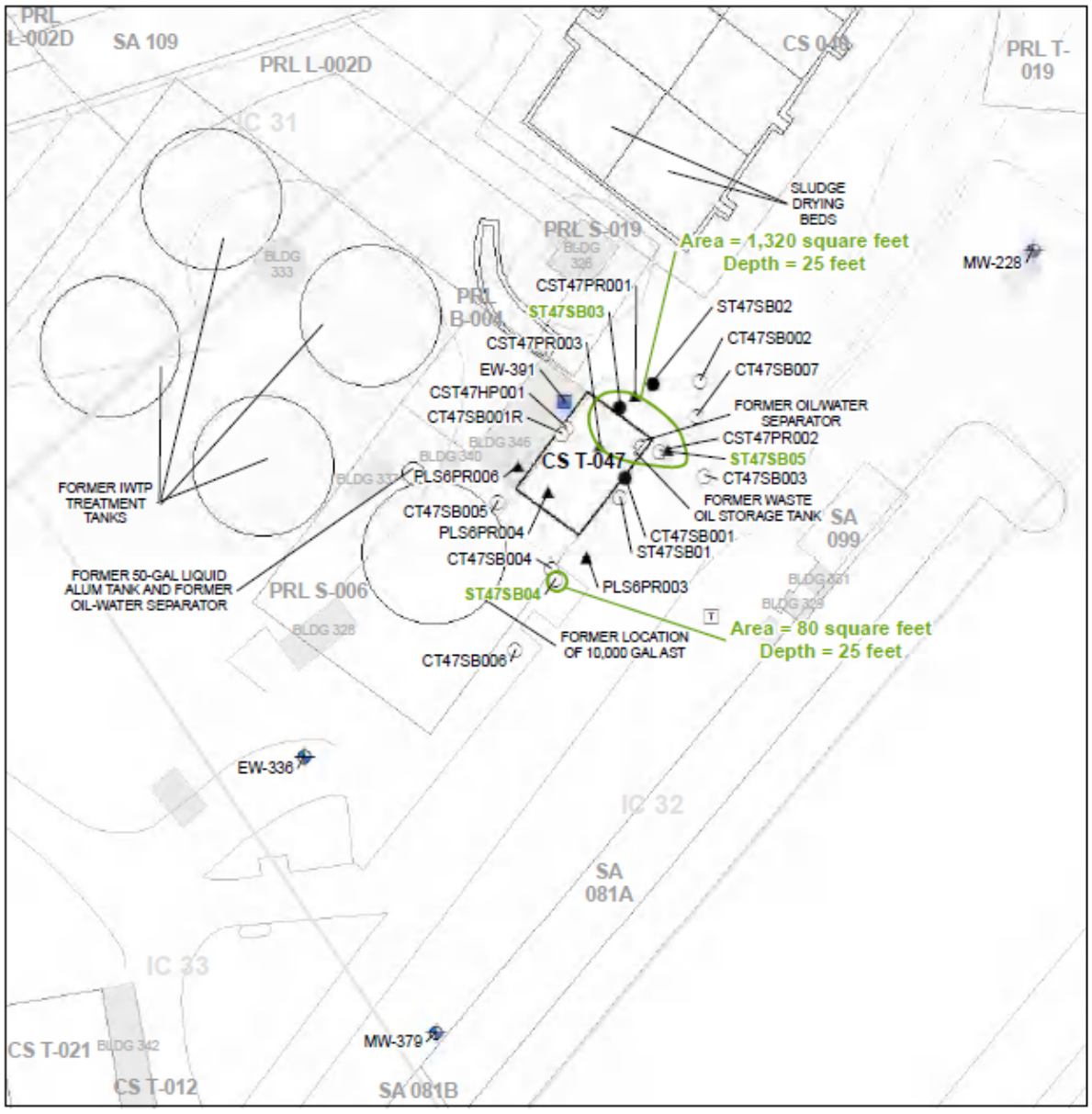
Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 2.2×10^{-5} and may exceed 10^{-4} when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for CS T-047 is industrial. Alternatives VOC2 and Non-VOC4a were selected to address VOCs in SSG that exceed the risk management range for unrestricted use and to address TPH-D and TPH-G in soil that pose a threat to groundwater quality. VOC2 was selected over VOC3 because SSG risks are greater than the risk management range for unrestricted use, but are still within the risk management range for industrial use and ECs are not needed to protect future commercial/industrial workers. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit exposures to VOCs in SSG.

The industrial use target volume under Alternative Non-VOC4a is 1,290 cubic yards, and was selected to remove TPH-D and TPH-G in soil that exceed levels protective of groundwater quality. The unrestricted use target volume under Non-VOC4b is the same (1,290 cubic yards) because the excavation volume is based on the removal of soil for the protection of groundwater quality. The concentrations of naphthalene and 2-methylnaphthalene that cleanup levels for human health are co-located with the TPH concentrations that will be removed for the protection of groundwater quality. The lack of surface sampling at the site

and a recent site visit confirmed that ECs are needed to protect surface water quality. Before completion of the RD, sufficient surface samples must be collected to demonstrate that there is no risk to surface water or sediment traps and monitoring are required. Due to this uncertainty, and because the future use is expected to be industrial, Non-VOC4a was selected over Non-VOC4b. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

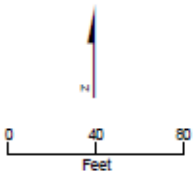
The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.



LEGEND

- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR MONITORING WELL
- SOIL GAS BORING
- SHALLOW BORING (0-15 FT BGS)
- MID TO DEEP BORING (>15 FT BGS)
- TRANSFORMER
- INDUSTRIAL WASTE LINES
- ROADS
- TARGET VOLUME
- BUILDINGS
- CS T-047
- IC BOUNDARY

Notes:
Borings in green have contaminant concentrations greater than PCGs.



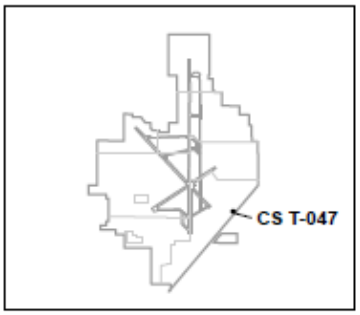


Figure D-33 CS T-047 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

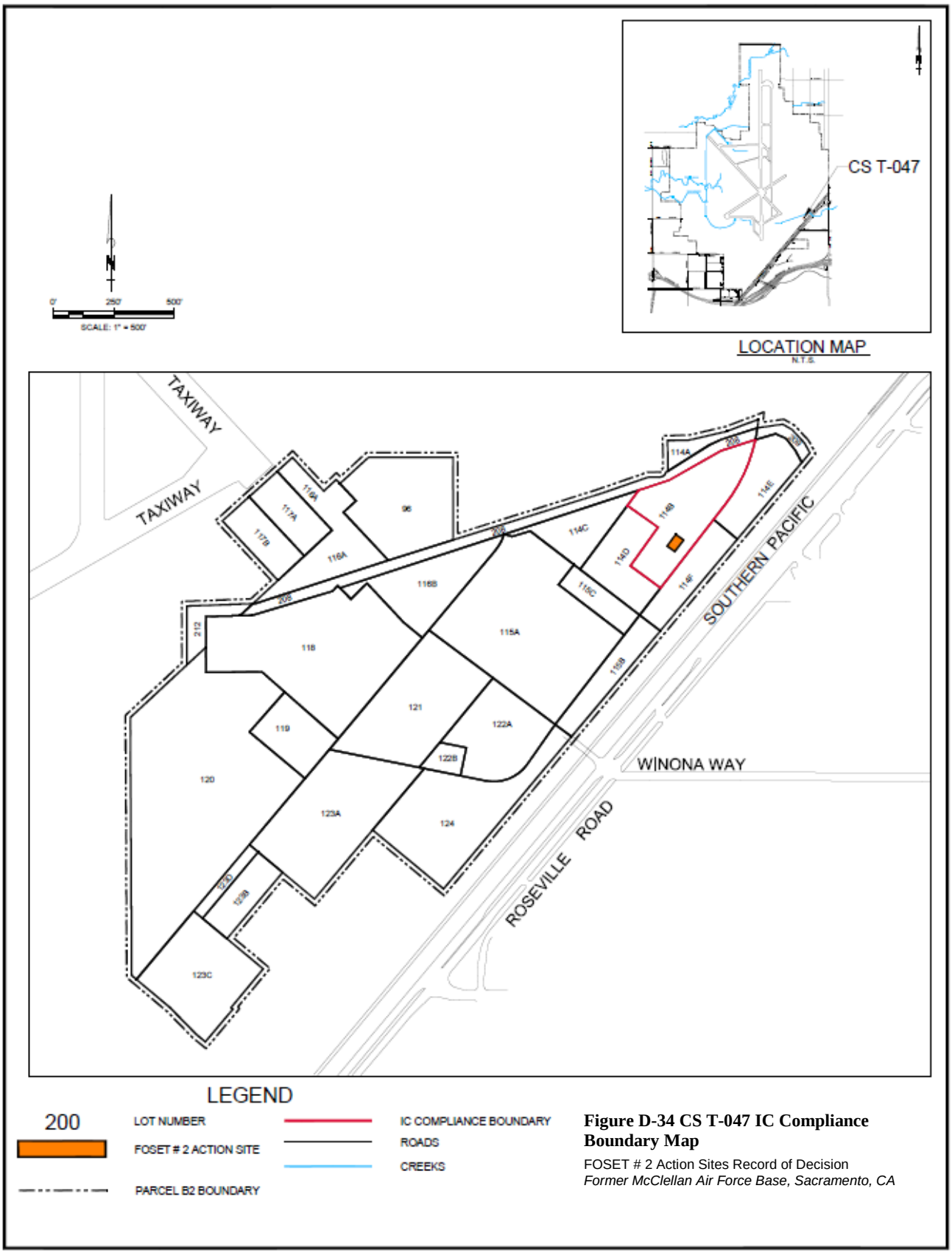


Figure D-34 CS T-047 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

CS T-057: This site is an 82,000-square foot area used for storage of unknown materials and fire training. Building 431, a former jet engine testing facility, was also located at this site. A 1,000-gallon wastewater UST was located about 40 feet north of the northern corner of Building 431. The UST was removed in 1988, but was not granted closure status. Two 3,000-gallon ASTs and a 1,000-gallon AST were formerly located on the northwestern side of Building 431. The site is now an open area mostly covered with gravel.

Selected Remedy: Alternatives VOC3 (ICs/ECs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; dioxins/furans and lead in soil

Shallow Soil Gas: Risks are greater than the risk management range for unrestricted use and at the high end of the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. For the residential scenario, the carcinogenic risk ranges between 2×10^{-7} and 2×10^{-3}, and the non-carcinogenic HI ranges from less than 1 to 9. For the occupational worker scenario, the carcinogenic risk ranges between 1×10^{-8} and 9×10^{-5}, and the non-carcinogenic HIs are less than 1. CS T-057 is under the influence of the IC 35 SVE system. The COCs are 1,2,4-TMB; 1,3,5-TMB; 1,2-DCA; benzene; chloroform; cis-1,2-DCE; ethylbenzene; naphthalene; PCE; TCE; and vinyl chloride.

Soil: Leaks from the UST and IWL have impacted the subsurface soil. Leaks from the ASTs and discharges during fire training and jet engine testing activities have impacted the surface soil. Soil risks, driven by dioxins/furans, are greater than the risk management range for unrestricted use and within the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. The carcinogenic risk is 5×10^{-4} for the residential scenario and 4×10^{-5} for the occupational worker scenario. The non-carcinogenic HI for the residential scenario is 5, due to arsenic, dioxins/furans, and 2-methylnaphthalene, and the occupational worker scenario is less than 1. Lead was detected at concentrations above the unrestricted screening level, but below the restricted screening level. Lead, dioxins/furans, TPH, and PAH concentrations exceed levels for the protection of surface water quality. Dioxins/furans were detected at concentrations greater than the cleanup level and the screening level for protection of surface water. The COCs are dioxins/furans and lead.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 1.3×10^{-4} and may be higher when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for CS T-057 is industrial. Alternatives VOC3 and Non-VOC4a were selected to address VOCs in SSG that exceed the risk management range for unrestricted use and to address lead and dioxins/furans in soil that pose a threat to surface water quality. The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG exceeds the risk management range. VOC3 was selected over VOC2 to protect commercial/industrial workers due to uncertainty because the maximum risk for industrial use from SSG is nearly 1×10^{-4}. The ICs and ECs established by Alternative VOC3 will restrict the use of the site and require the installation of engineered controls in any future buildings or during significant remodeling of existing buildings to mitigate the potential for VOCs in SSG from migrating into buildings and impacting occupants via the vapor inhalation pathway. The parcel and lots affected by the IC compliance buffer for Alternative VOC3 are Parcel B2, Lots 119, 120, and 204.

The industrial use target volume (combined with SA 080 and SA 107) under Alternative Non-VOC4a is 110 cubic yards, and was selected to remove lead and dioxins/furans in soil that exceed levels protective of surface water quality. The unrestricted use target volume of 110 cubic yards under Non-VOC4b was not selected. Based on sampling results, and to protect surface water, ECs are needed to maintain surface cover in the vicinity of sample CST57SB021. Due to the need for ECs, and because the future use is expected to be industrial, Non-VOC4a was selected over Non-VOC4b. The ICs established by

Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because soil risks exceed the risk management range for unrestricted use and the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

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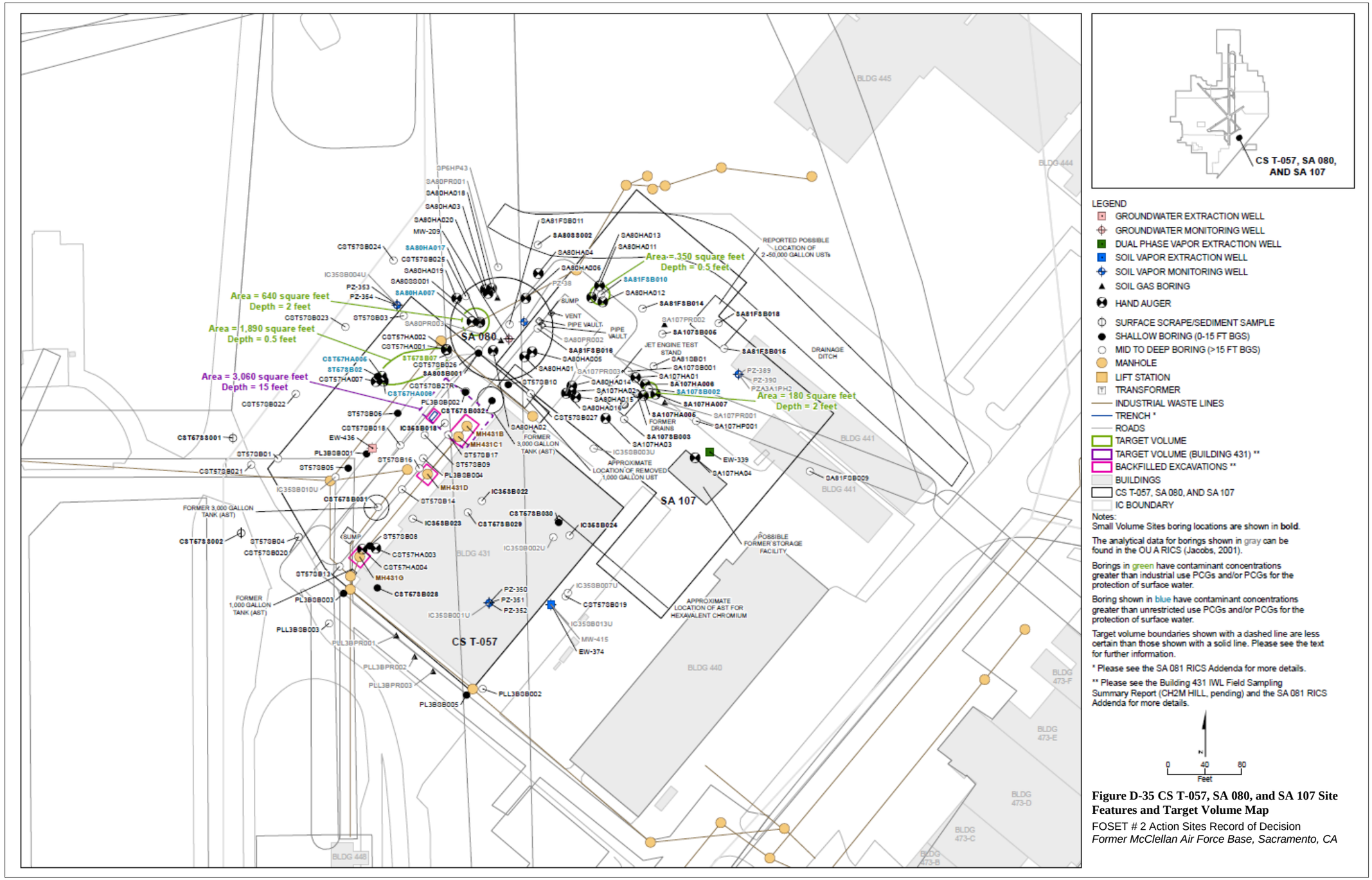

Figure D-35 CS T-057, SA 080, and SA 107 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

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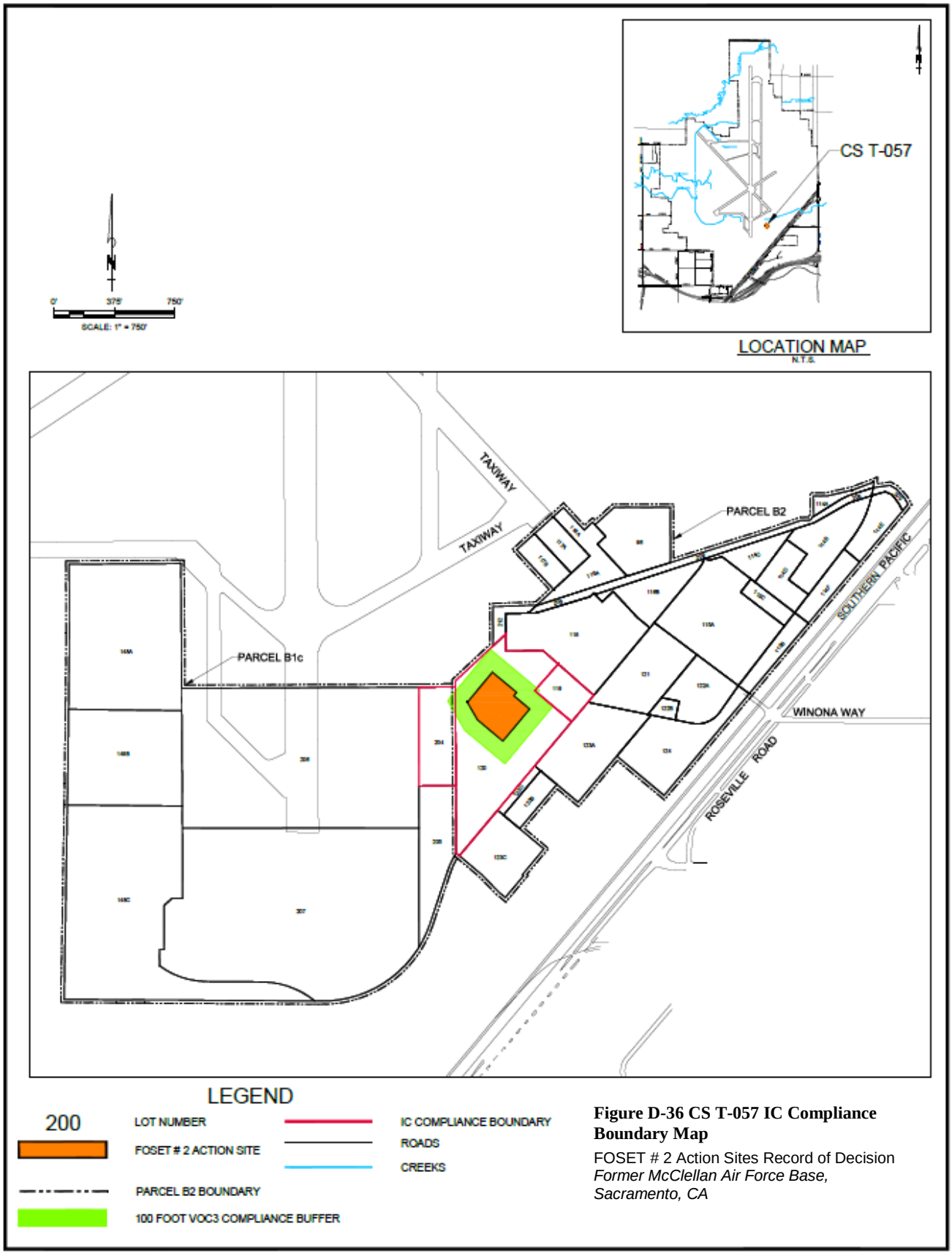

Figure D-36 CS T-057 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

PRL S-001: This site consists of Building 343, which covers approximately half of the site's 32,400 square feet. Building 343 was used for plating, battery storage and maintenance, sandblasting, buffing, and lacquer operations. Building 343 was also identified as a pretreatment facility, which included chromium and cadmium recovery and residual chromium reduction. Waste in the building was discharged into trenches which collected and transported spilled and discharged waste to the IWL. In 1962, Building 343 was converted to a warehouse for electrical and nonhazardous materials and eventually remodeled to office space in the 1980s.

Selected Remedy: Alternatives VOC2 (ICs), Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; lead and cadmium in soil

Shallow Soil Gas: Risks are within the risk management range for unrestricted use, and at the low end of the risk management range for restricted use. The cumulative sample-by-sample carcinogenic risks for the residential scenario range from 5×10^{-6} to 4×10^{-5} and total non-carcinogenic HIs are less than 1. Carcinogenic risks for the occupational worker scenario range from 3×10^{-7} to 3×10^{-6} and non-carcinogenic HIs are less than 1. PCE was detected at a concentration greater than the industrial use screening level. PRL S-001 is within the radius of influence of the IC 29 SVE system. The COCs are benzene, carbon tetrachloride, chloroform, ethylbenzene, naphthalene, PCE, and TCE.

Soil: Releases from leaks in the trenches beneath the plating tanks have impacted the subsurface soil. Soil risks are within the risk management range for both unrestricted use and restricted use. In addition, the HI for unrestricted use exceeds 1. The carcinogenic risk is 6×10^{-5} for the residential scenario and 4×10^{-6} for the occupational worker scenario. The non-carcinogenic HI for the residential scenario is 9, due to cadmium and arsenic, and the HI for the occupational worker scenario is less than 1. Cadmium was detected at concentrations greater than combined background in eight samples. Both cadmium and lead were detected at concentrations greater than the screening level for protection of surface water. The COCs are cadmium and lead.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 7×10^{-6} and may exceed 10^{-4} when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for PRL S-001 is industrial. Alternatives VOC2 and Non-VOC4a were selected to address VOCs in SSG and to address cadmium and lead in soil that pose a threat to surface water quality. Only three locations were sampled for SSG at this 32,400 square foot site, which is not a sufficient number of SSG samples to characterize PRL S-001. VOC2 was selected due to this uncertainty and because the risk associated with the limited number of samples is at the upper end of the risk management range. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit potential exposures to VOCs in SSG.

The industrial use target volume under Alternative Non-VOC4a is 80 cubic yards, and was selected to remove cadmium and lead in soil from the site that exceed levels protective of surface water in the area associated with the target volume and to remove lead that exceeds the industrial cleanup level. The unrestricted use target volume of 410 cubic yards under Non-VOC4b was not selected. Lead exceeded the cleanup level for surface water quality protection, and ECs will be required where excavation is not planned. For this reason, as well as the expected industrial use, Non-VOC4a was selected over Non-VOC4b. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if the existing surface covers are removed or existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. The

selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

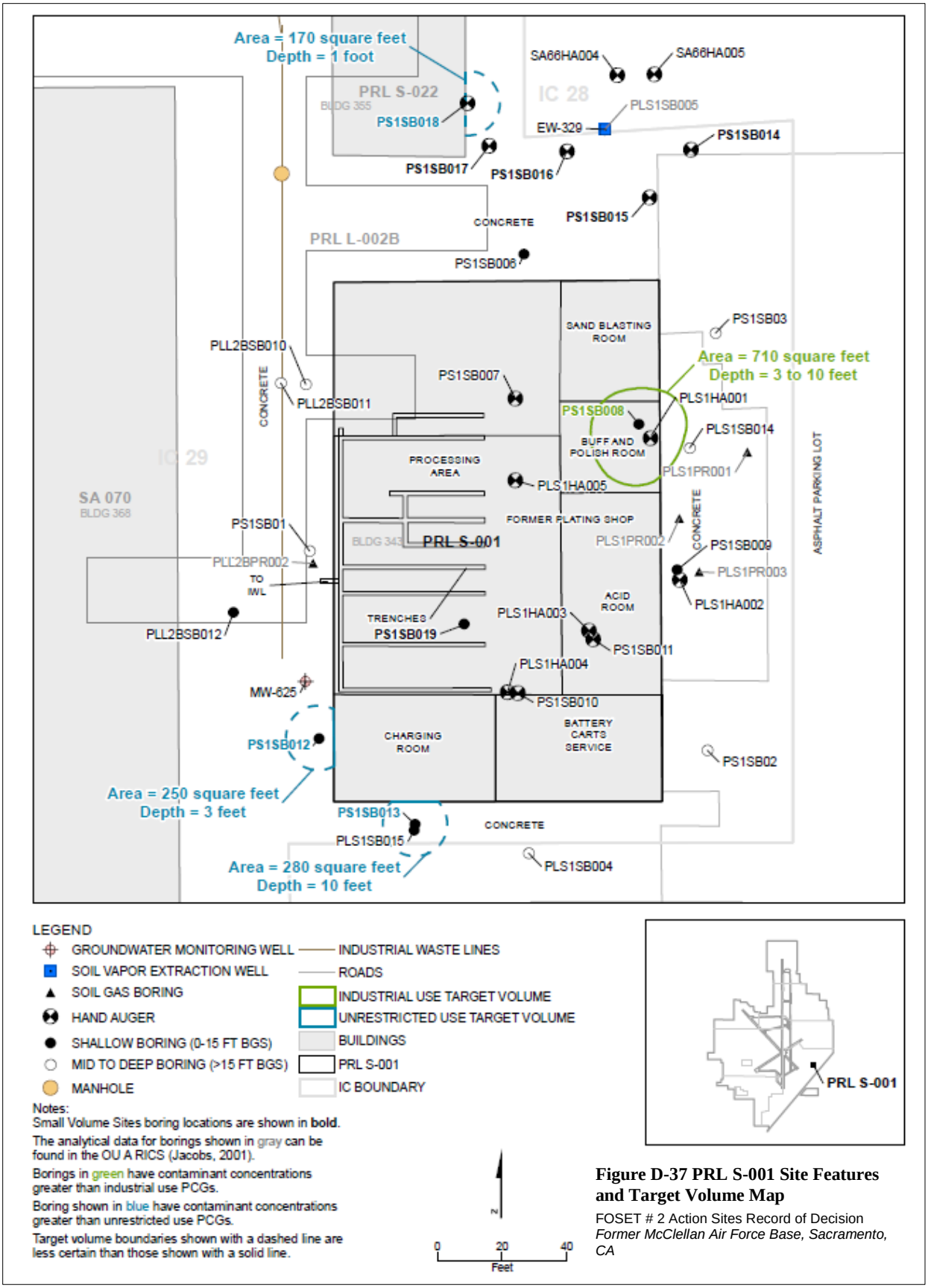

Figure D-37 PRL S-001 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

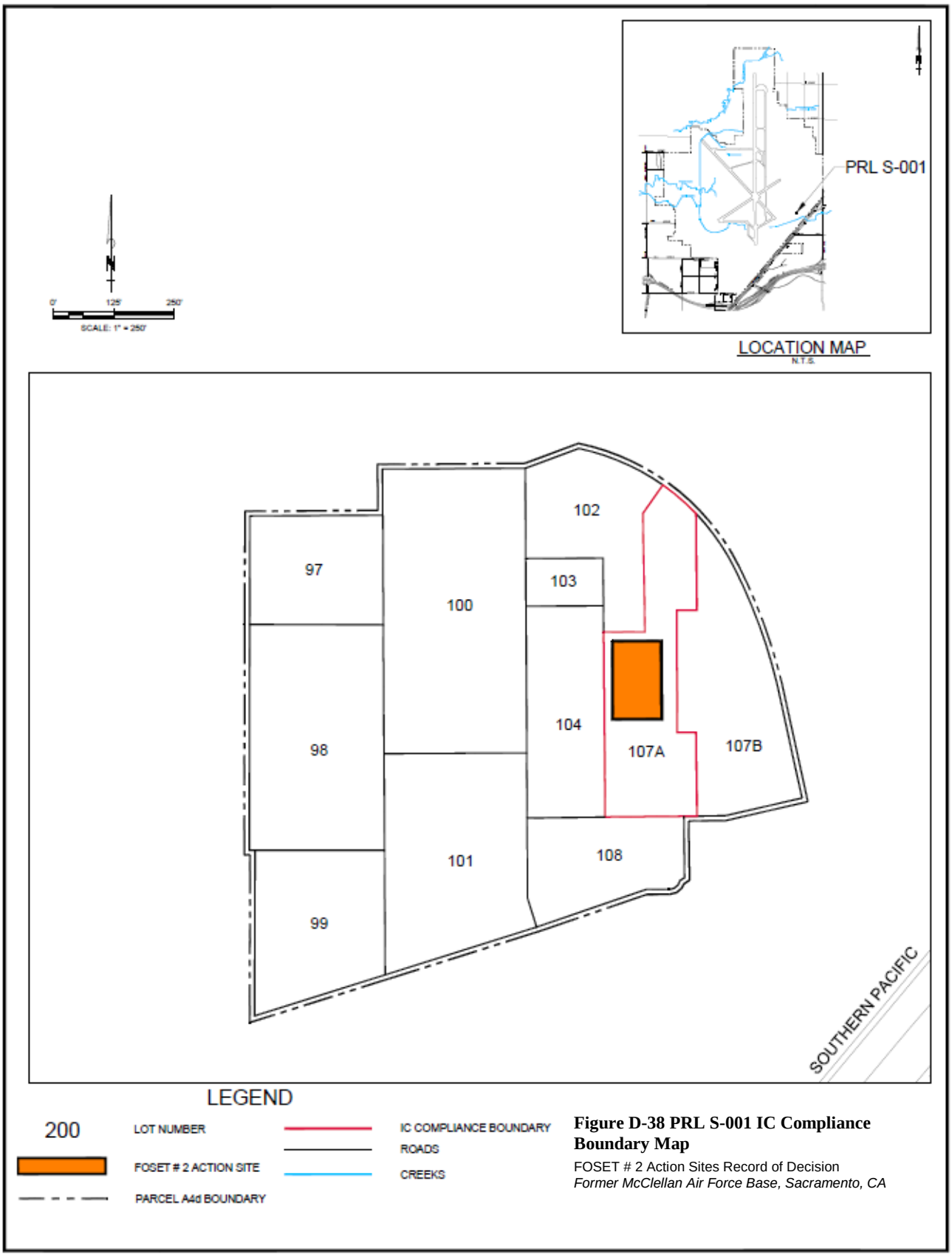

Figure D-38 PRL S-001 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

PRL S-002: This site is the former location of Building 447, which stored paint and oil. The site is approximately 110 feet by 160 feet. After 1970, the northern portion of the building received fuels used at the base and distributed them to other locations on base. A transformer was also identified near the northeastern corner of the building. Building 447 was demolished in 1993.

Selected Remedy: Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: PCBs and PAHs in soil

Shallow Soil Gas: Risks are within the risk management range for unrestricted use and less than the risk management range for restricted use. The cumulative sample-by-sample carcinogenic risks for the residential scenario range from 2×10^{-7} to 8×10^{-6}, and total non-carcinogenic HIs were less than 1. Carcinogenic risks for the occupational worker scenario are less than 1×10^{-6} and non-carcinogenic HIs are less than 1. Although the risk for the residential scenario is within the risk management range, the site is considered sufficiently characterized and concentrations of VOCs are all less than industrial use screening levels. PRL S-002 was also under the influence of the IC 35 SVE system. No COCs have been identified.

Soil: Releases of contaminants stored at the site or transformer oil leaks have impacted the surface soil. Soil risks, primarily driven by PCBs, are at the high end of the risk management range for unrestricted use and within the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. The potential carcinogenic risk is 1×10^{-4} for the residential scenario and 1×10^{-5} for the occupational worker scenario. The non-carcinogenic HI for the residential scenario is 15, due to Aroclor-1260 and the occupational worker scenario is less than 1. Aroclor-1260 is the primary risk driver for carcinogenic risk greater than 1×10^{-4}, and the HI is greater than 1 under the residential scenario. PAHs and TPH-D were detected at concentrations greater than levels for protection of surface water. PCBs were detected near the transformer northeast of the site at concentrations greater than levels for protection of surface water. The COCs are Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at PRL S-002.

Rationale for Selected Remedies: The expected future use for PRL S-002 is industrial. Alternative Non-VOC4a was selected to address PAHs and Aroclor-1260 in soil that pose a threat to surface water quality. The industrial use target volume under Alternative Non-VOC4a is 120 cubic yards, and was selected to remove PAHs and Aroclor-1260 in soil that exceed levels protective of surface water quality. The unrestricted use target volume of 6,810 cubic yards under Non-VOC4b was not selected. Before completion of the RD, additional surface sampling must be completed to delineate the extent of contamination due to several sample locations that exceeded surface water quality requirements. Excavation of locations that exceed levels protective surface water quality, maintaining surface cover, or sediment traps and monitoring is required. The excavation volume is also significantly larger for Non-VOC4b, and the extent above unrestricted cleanup levels is not defined to west. For these reasons, as well as the expected industrial use, Non-VOC4a was selected over Non-VOC4b. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

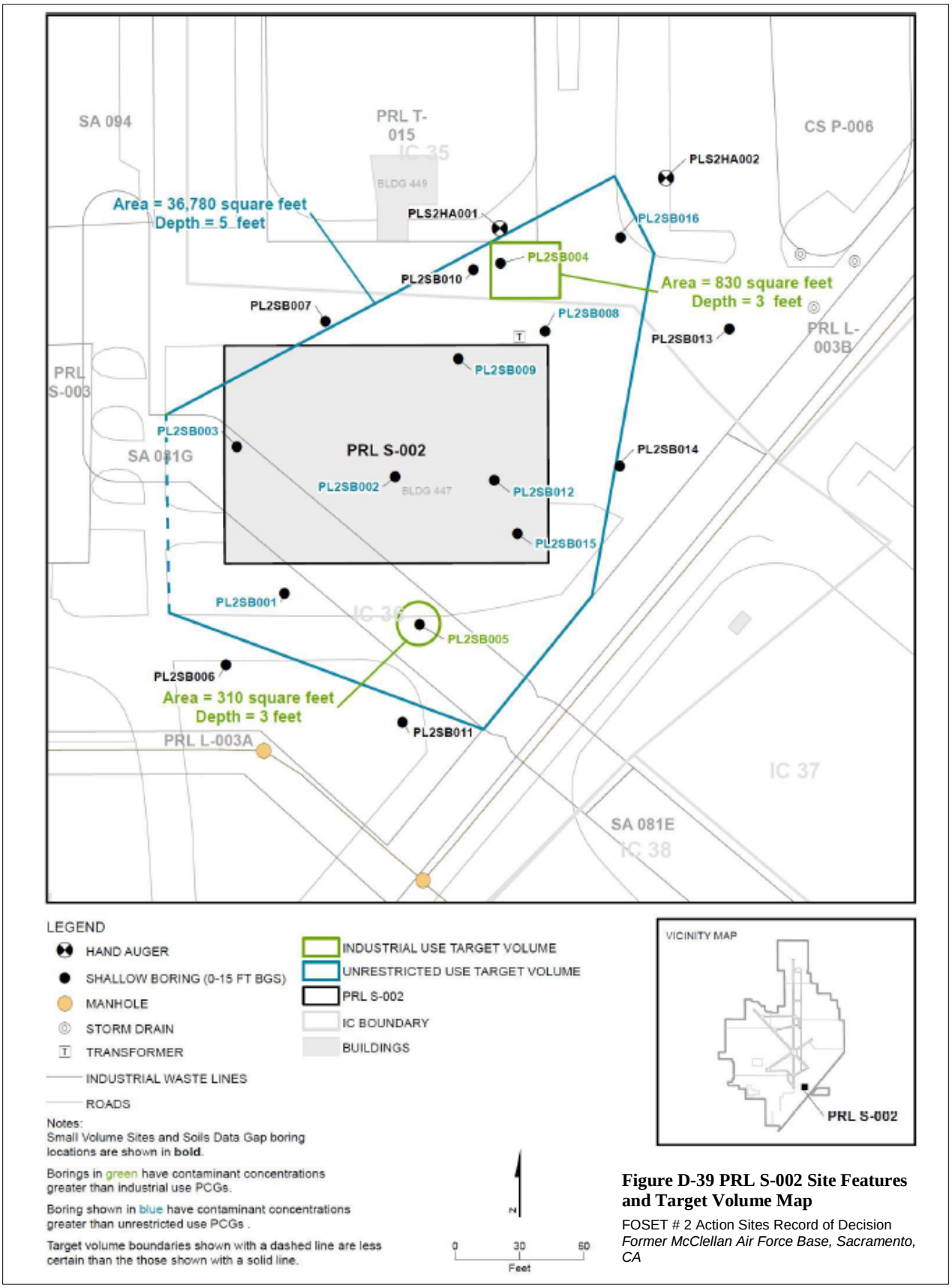

Figure D-39 PRL S-002 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

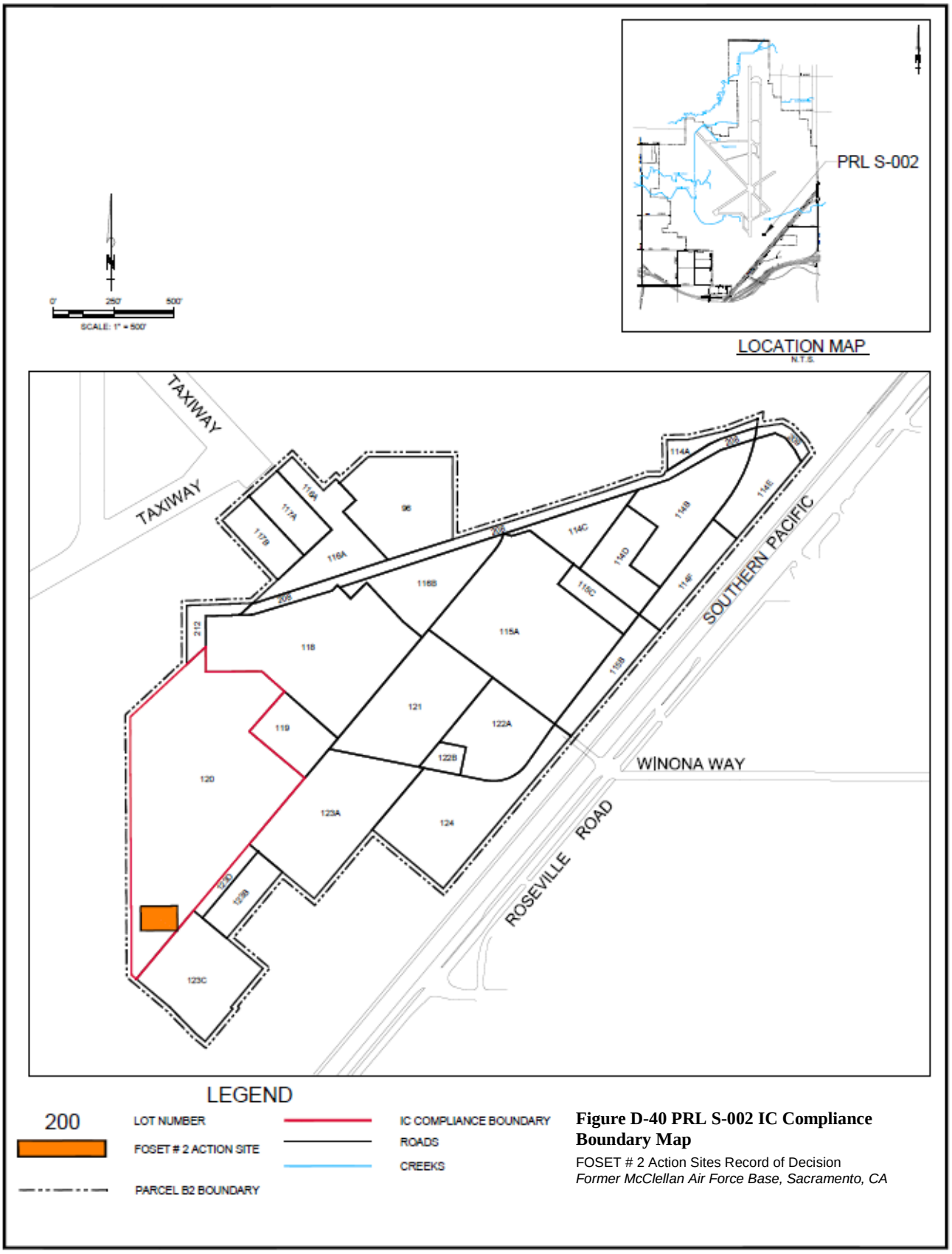

Figure D-40 PRL S-002 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

PRL S-006: This site is the location of former IWTP #1, which received wastewater containing fuels, oils, solvents, chromic acid, and phenols from base operations until 1972. PRL S-006 is approximately 15,000 square feet of pavement, grass, asphalt, and concrete. The IWTP may have also received wastewater from Technical Operations Divisions (TOD) laboratories at Buildings 334 and 357, as well as from Building 252. These facilities may have contributed radiologically contaminated waters to the PRL S-006 site. The IWTP #1 was demolished in 1994.

Selected Remedy: Alternatives VOC2 (ICs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; PAHs, PCBs, dieldrin, and lead in soil

Shallow Soil Gas: Risks are greater than the risk management range for unrestricted use, and within the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. For the residential scenario, carcinogenic risks ranged from 5×10^{-7} to 3×10^{-4}, and the non-carcinogenic HI ranged from less than 1 to 5. For the occupational worker scenario, carcinogenic risks ranged from 3×10^{-8} to 2×10^{-5}, and the non-carcinogenic HI was less than 1. The COCs are 1,1- DCA, benzene, chloroform, cis-1,2-DCE, naphthalene, PCE, TCE, and vinyl chloride. It should be noted that Ra-226 was previously a soil COC at PRL S-006; however, Ra-226 contamination was removed during the SVS and Building 252 Radiological NTCRA and is no longer a COC for PRL S-006. A total of 92 cubic yards of contaminated soil were removed.

Soil: Releases from leaks in ASTs or USTs and associated piping may have impacted the site soil. Soil risks, primarily associated with PCBs, pesticides, and PAHs, are greater than the risk management range for unrestricted use, and at the high end of the risk management range for restricted use. In addition, the HI for unrestricted use exceeds 1. The carcinogenic risk for the residential scenario is 1×10^{-3}, and the non-carcinogenic HI is 2 due to arsenic, cadmium, and Aroclor-1260. For the occupational worker scenario, the carcinogenic risk is 1×10^{-4}, and the non-carcinogenic HI is less than 1. Lead, PAHs, and PCBs were detected at concentrations greater than levels for protection of surface water quality. The COCs are Aroclor-1260, dieldrin, lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene. It should be noted that Ra-226 was previously a soil COC at PRL S-006; however, Ra-226 contamination was removed during the SVS and Building 252 Radiological NTCRA and is no longer a COC for PRL S-006. A total of 92 cubic yards of contaminated soil were removed.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 1.2×10^{-4} and may be higher when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for PRL S-006 is industrial. Alternatives VOC2 and Non-VOC4a were selected to address VOCs in SSG that exceed the risk management range for unrestricted use and to address PAHs in soil that exceed the risk management range for industrial use, as well as lead, PAHs, and PCBs in soil that pose a threat to surface water quality. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit exposures to VOCs in SSG, because risks are greater than the risk management range for unrestricted use and the HI for unrestricted use exceeds 1. VOC2 was selected over VOC3 because the risk for SSG does not exceed the risk management range for industrial use.

The combined industrial use target volume under Alternative Non-VOC4a for adjacent sites CS 040, PRL S-006, and PRL S-019 is 12,248 cubic yards, and was selected to remove PAHs in soil that exceed industrial use cleanup levels as well as lead, PAHs, and PCBs in soil that exceed levels protective of surface water quality. If contamination is found when delineation sampling is done for the remaining contaminated soil, the backfill placed when the SVS and Building 252 Radiological NTCRA was completed will be removed and stockpiled for use in backfilling the excavations associated with the

selected remedy. If the delineation samples indicate that contamination has been addressed, additional excavation will not be necessary. The unrestricted use target volume of 17,040 cubic yards under Non-VOC4b was not selected because the future use for CS 040, PRL S-006, and PRL S-019 is industrial, there will be ICs associated with VOC2, and the HI for unrestricted use exceeds 1. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the soil risks exceed the risk management range for unrestricted use. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

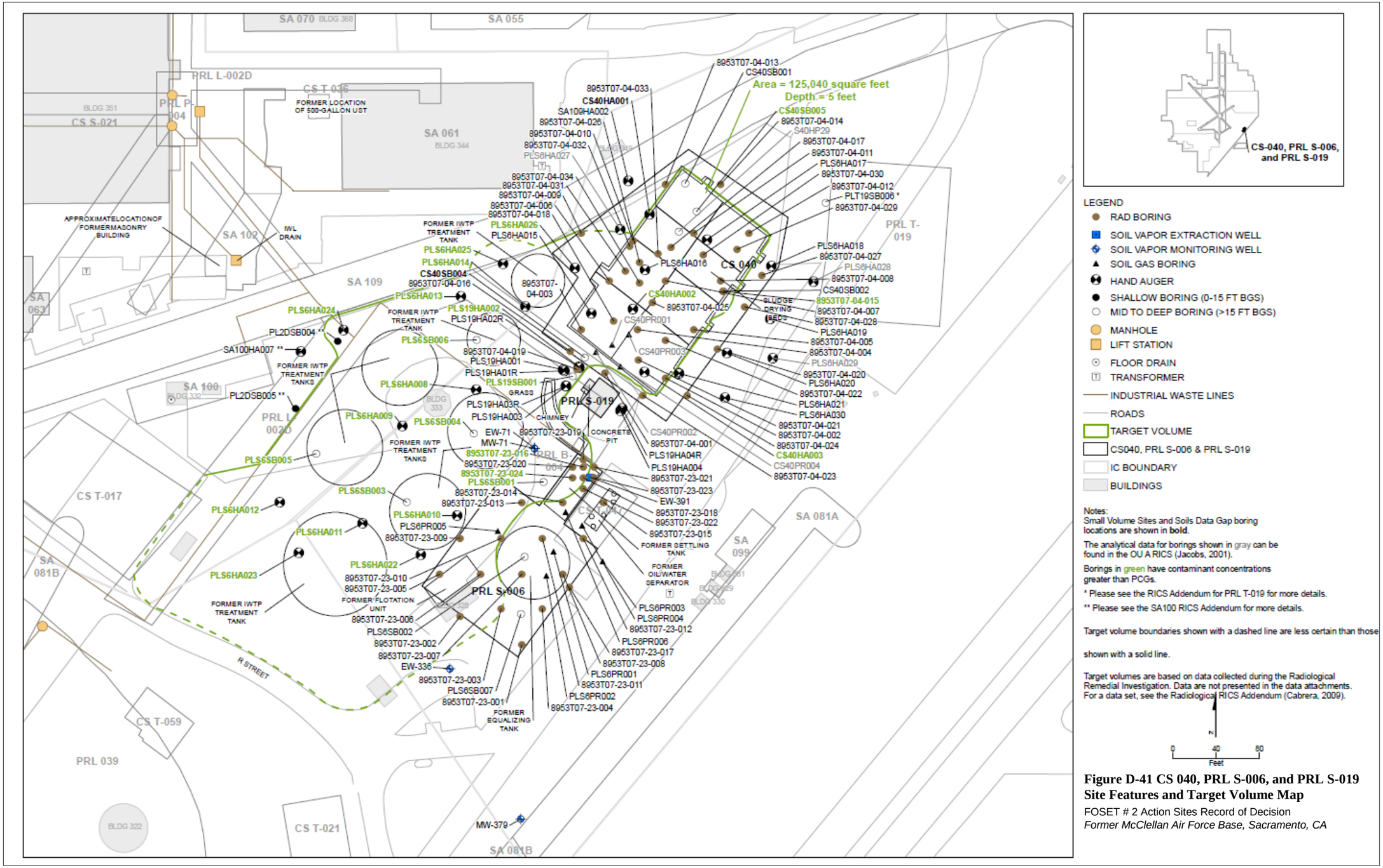

Figure D-41 CS 040, PRL S-006, and PRL S-019 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision

Former McClellan Air Force Base, Sacramento, CA

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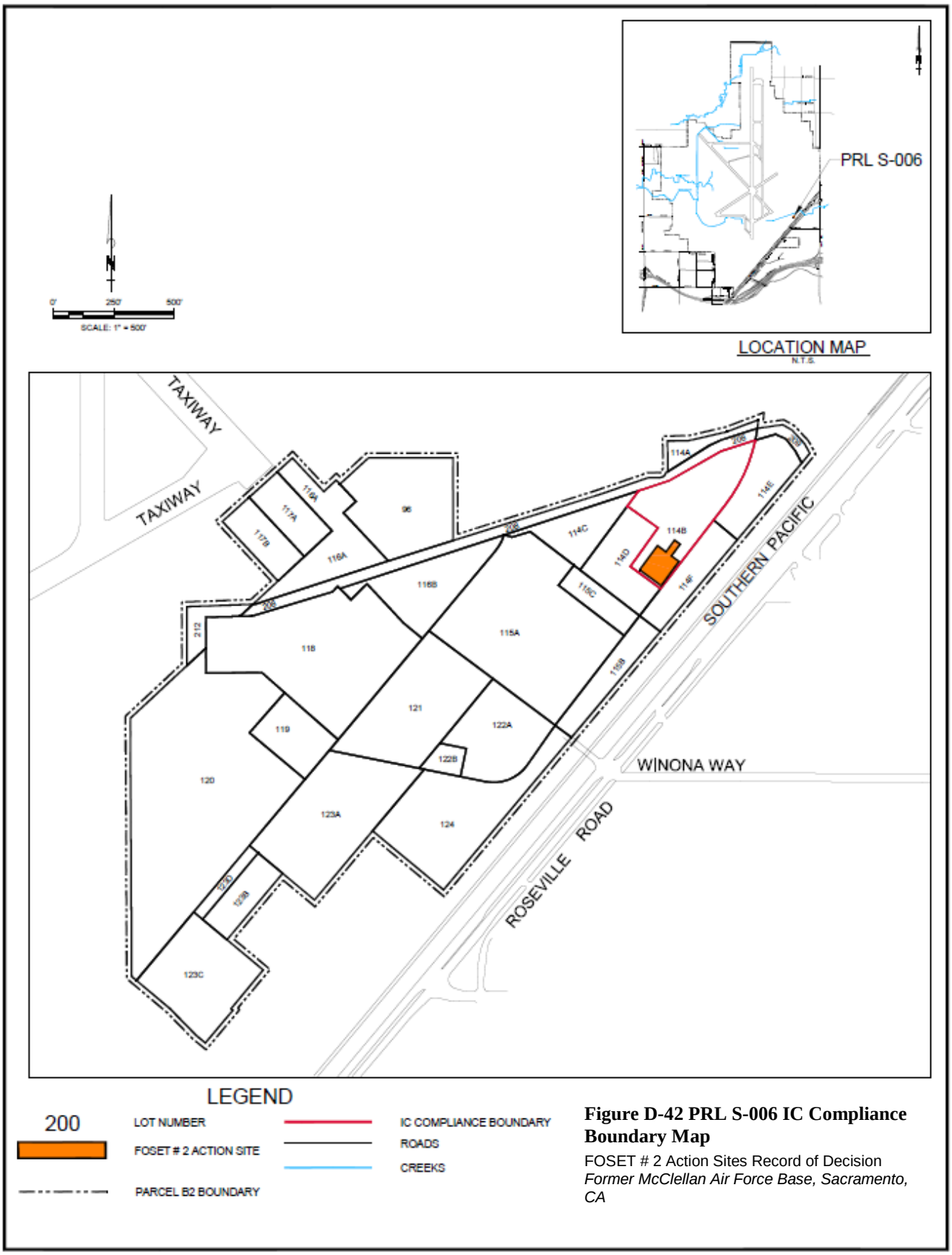

Figure D-42 PRL S-006 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

PRL S-017: This site consists of Building 251, which was used primarily for aircraft maintenance and covers 770,000 square feet. Aircraft propellers, engines, wings, fuselages, landing gear, and electrical systems were repaired in Building 251. Oil, grease, hydraulic fluid, gasoline, jet fuel, and solvents were used during these maintenance activities. Two washracks, several USTs, ASTs, an OWS, and an oil sump were located near Building 251. A 150-gallon leaded gasoline UST that was located near Building 298 provided fuel to operate the pump at Base Well No. 1. This UST was removed in 1988 or 1990. A 200-gallon MOGAS UST (UST 231) was located near Building 231 and provided fuel to a pump located in Building 231. The MOGAS UST was removed in 1984. There was an OWS located 40 feet north of Building 231, but it was not observed during the last site visit. It is unknown when the OWS was removed. Closure has not been granted for the USTs or the OWS. Several drains are located within Building 251 and connect to the IWL (PRL L-002A). It was a common practice to discharge hazardous materials to the IWL for disposal. In 1970, all the IWL drains were plugged and all wastes were containerized and removed from the building for disposal.

Selected Remedy: Alternatives VOC2 (ICs), Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; TPH-D and TPH-G in soil

Shallow Soil Gas: Risks are within the risk management range for unrestricted use, and at the low end of the risk management range for restricted use. The cumulative sample-by-sample carcinogenic risks for the residential scenario range from 5×10^{-7} to 3×10^{-5}, and total non-carcinogenic HIs were less than 1. Carcinogenic risks for the occupational worker scenario are less than 1×10^{-6}, except for one risk of 2×10^{-6}; non-carcinogenic HIs are less than 1. The COCs are benzene, carbon tetrachloride, chloroform, naphthalene, and TCE. PRL S-017 is within the radius of influence of the IC 23 SVE system.

Soil: Leakage from the gasoline USTs and diesel ASTs, releases from the oil sump, OWS, washracks, paint booth, operations in the machine shop, and aircraft maintenance have impacted the site soil. Soil risks are within the risk management range for both unrestricted and restricted use. The carcinogenic risks for the residential scenario and the occupational scenario are 5×10^{-5} and 4×10^{-6} respectively. The non-carcinogenic HIs for both scenarios are less than 1. TPH-D and TPH-G exceeded groundwater protection cleanup levels, and are COCs at PRL S-017. In addition, an uncertainty exists for TPH-D and TPH-G because the vertical and lateral extents are not fully defined.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 6×10^{-6} and may exceed 10^{-4} when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for PRL S-017 is industrial. Alternatives VOC2 and Non-VOC4a were selected to address VOCs in SSG and to address TPH-D and TPH-G in soil that pose a threat to groundwater quality. Although SSG risks are within the risk management range for unrestricted use, there were too few SSG samples collected from beneath the slab of PRL S-017, which is a large site covering 770,000 square feet. VOC2 was selected due to these uncertainties. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit potential exposures to VOCs in SSG.

The industrial use target volume under Alternative Non-VOC4a is 530 cubic yards, and was selected to remove TPH-D and TPH-G in soil that exceeds levels protective of groundwater quality. The unrestricted use target volume under Non-VOC4b is the same (530 cubic yards) because the excavation volume is based on the removal of soil for the protection of groundwater quality. Non-VOC4a was selected over Non-VOC4b because there is uncertainty in the vertical and lateral extent of contamination, there are ICs associated with VOC2, and because the future use for PRL S-017 is industrial. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels

protective of surface water quality as shown in Table 2-4 are exceeded. The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

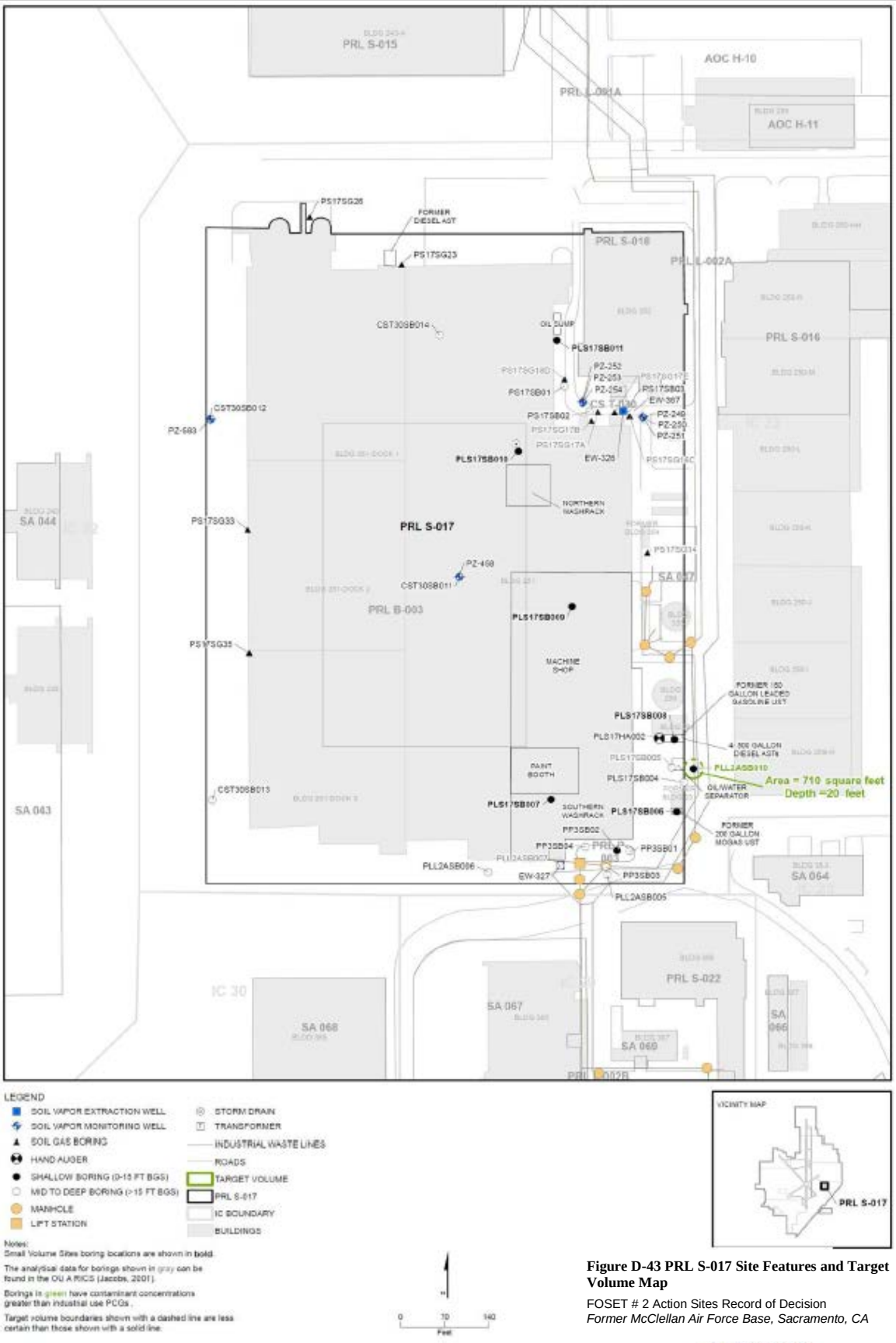

Figure D-43 PRL S-017 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

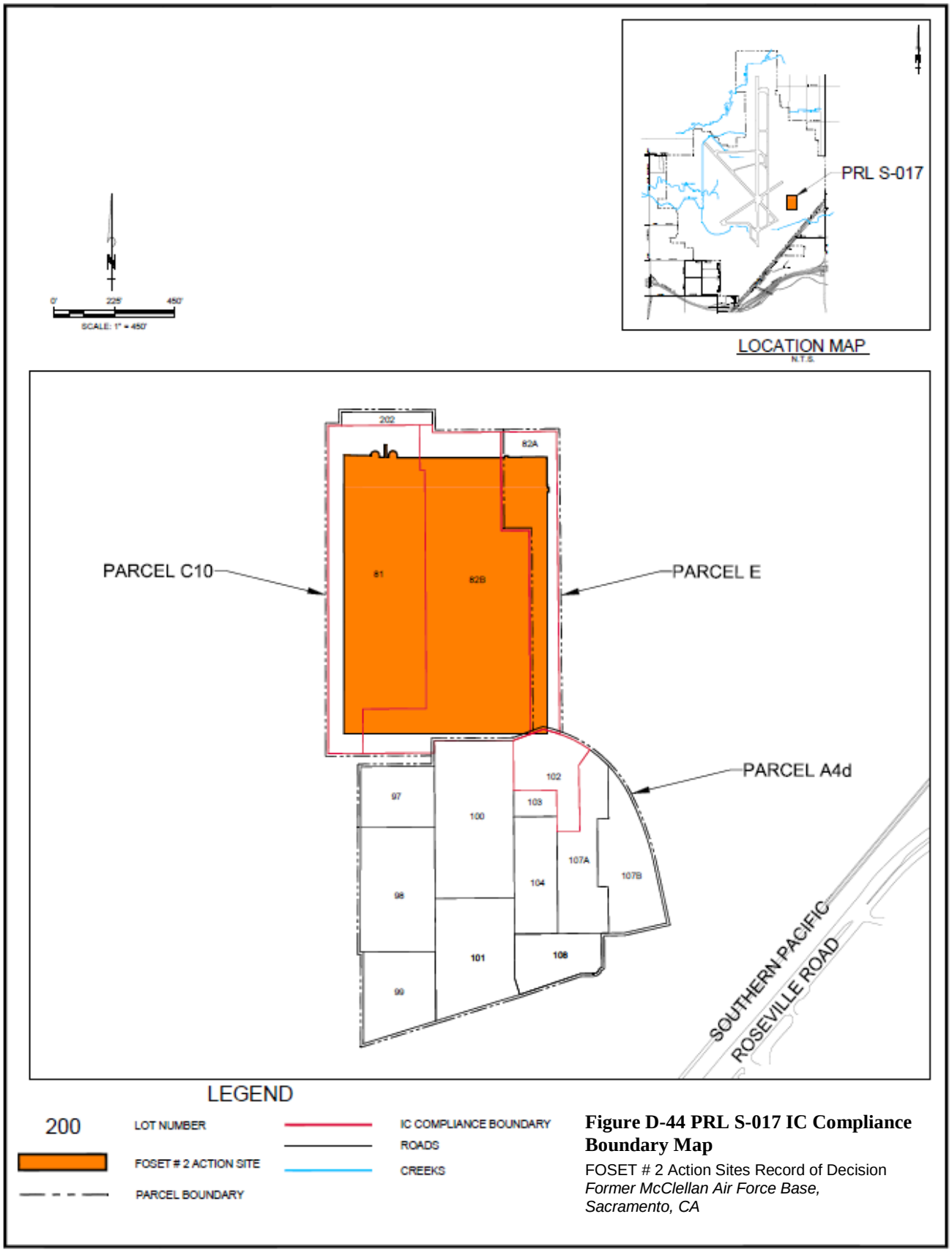

Figure D-44 PRL S-017 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

PRL S-018: This site consists of Buildings 252 (a former repair shop and radium dial painting facility, including a non-operational solvent waste line beneath the building) and 253 (a small storage outbuilding attached to the southeast portion of Building 252). Building 252 was originally constructed as a two-story brick-and-concrete building with a basement. Building 252 housed an instrument repair shop. Mercury was used in Building 252 to construct and repair manometers. Broken instruments and spills from repair activities resulted in the release of mercury onto floors and walls. Building 252 was expanded in 1954. Building 253 is a 180-square-foot outbuilding constructed on a 360-square-foot, bermed concrete pad located south of Building 252.

Selected Remedy: Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: Mercury in soil

Shallow Soil Gas: Risks are below the risk management range for unrestricted and restricted use. No COCs have been identified.

Soil: Leaks from the USTs associated with CS T-030 have impacted the subsurface soil. Soil risks, driven by mercury, are within the risk management range for both unrestricted and restricted use. The HI values for both use scenarios exceed 1. The carcinogenic risk is 2×10^{-5} for the residential scenario and 3×10^{-6} for the occupational worker scenario. The non-carcinogenic HI for the residential scenario is 575, due to mercury, and the HI for the occupational worker scenario is 13, due to mercury. Mercury was detected at concentrations greater than the levels for protection of surface water and groundwater quality. The COC is mercury. It should be noted that Ra-226 was previously a soil COC at PRL S-018; however, Ra-226 contamination was removed during the SVS and Building 252 Radiological NTCRA and is no longer a COC for PRL S-018. A total of 3,132 cubic yards of contaminated soil, asphalt, and concrete were removed.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at PRL S-018.

Rationale for Selected Remedies: The expected future use for PRL S-018 is industrial. Alternative Non-VOC4a was selected to address mercury in soil that exceeds the HI of 1 for industrial use and poses a threat to both surface water and groundwater quality. The industrial use target volume (combined with CS T-030) under Alternative Non-VOC4a is 3,243 cubic yards, and was selected to remove mercury in soil that exceeds the industrial cleanup levels and levels protective of both surface water and groundwater quality. The RAR for PRL S-018 did not sufficiently document that mercury was removed. If contamination is found when delineation sampling is done for the remaining contaminated soil, the backfill placed when the SVS and Building 252 Radiological NTCRA was completed will be removed and stockpiled for use in backfilling the excavations associated with the selected remedy. If the delineation samples indicate that contamination has been addressed, additional excavation will not be necessary. The unrestricted use target volume of 3,257 cubic yards under Non-VOC4b was not selected because the future use for CS T-030 and PRL S-018 is industrial. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that the surface cover must be maintained, sampling must be done, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

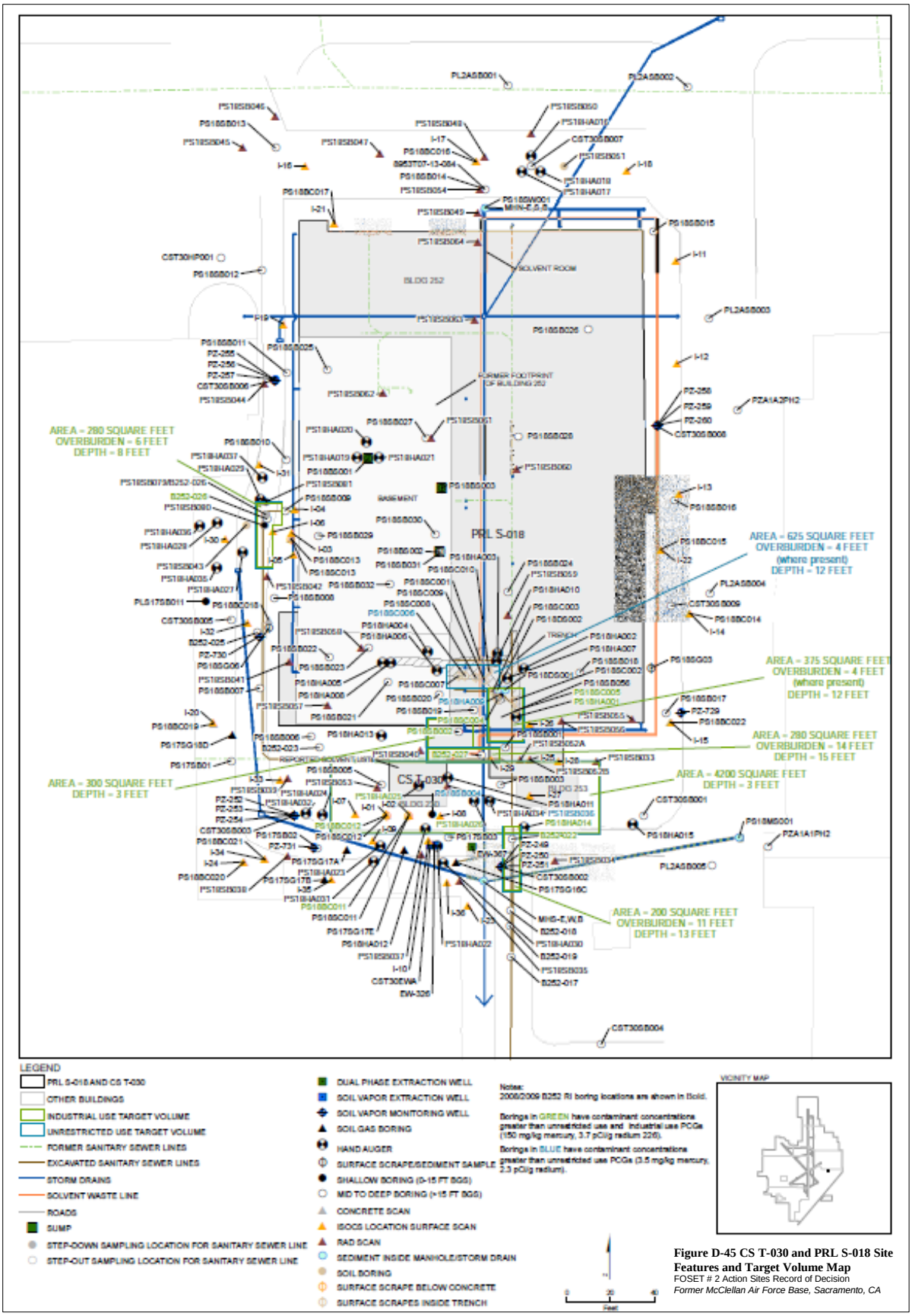

Figure D-45 CS T-030 and PRL S-018 Site Features and Target Volume Map
FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

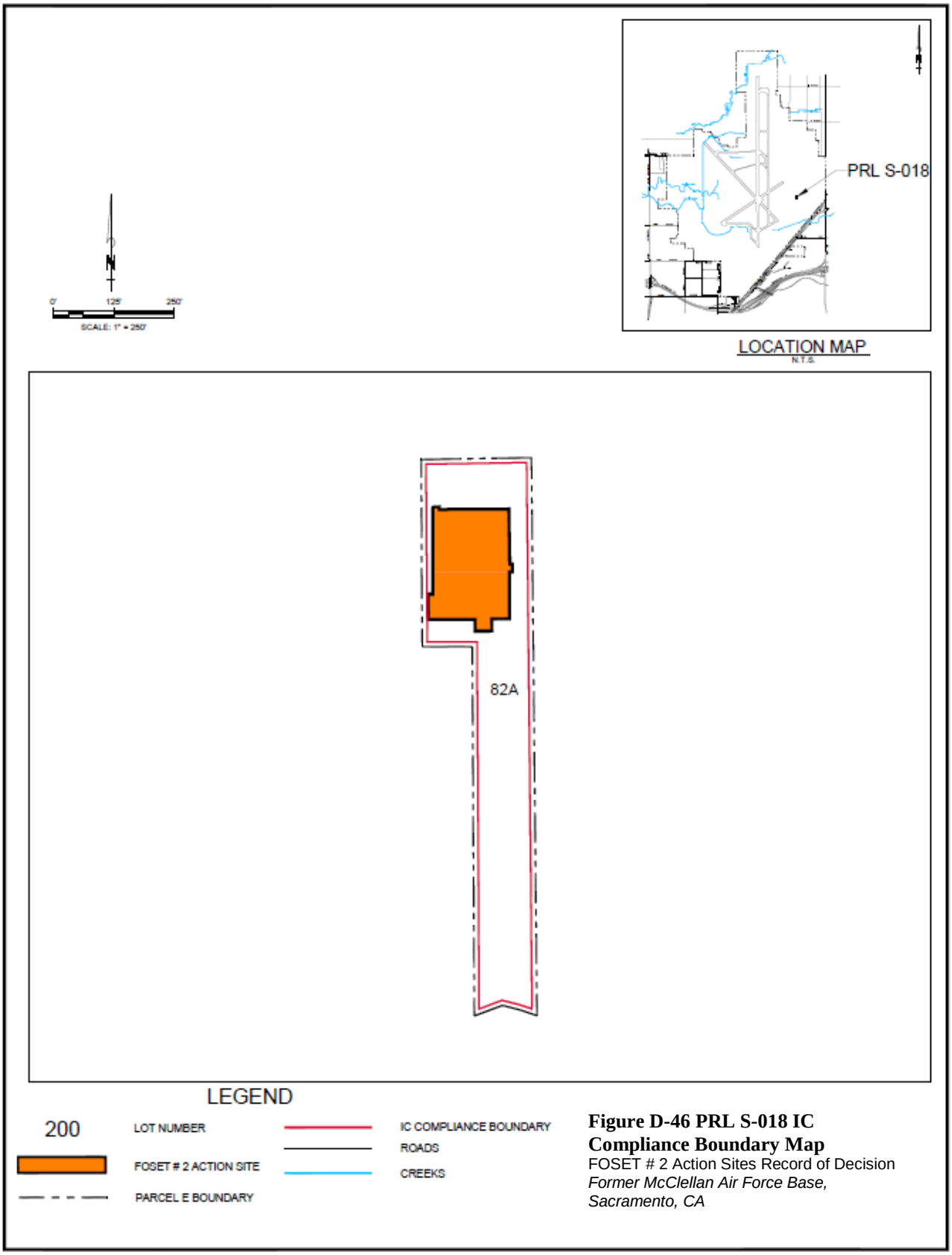

Figure D-46 PRL S-018 IC Compliance Boundary Map
FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

PRL S-019: This site covers 625 square feet and includes Building 326, which was used from 1960 to 1979 by the Entomology Unit to mix and store various herbicides and pesticides, mostly in powder form. The basement of the building housed fire boxes which were used for an unspecified length of time to incinerate small quantities of solid wastes. One drain in the basement of Building 326 is connected to the IWL.

Selected Remedy: Alternatives VOC2 (ICs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; PAHs, PCBs, pesticides, and lead in soil

Shallow Soil Gas: Risks are greater than the risk management range for unrestricted use, and within the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. For the residential scenario, carcinogenic risks ranged from 5×10^{-7} to 3×10^{-4}, and the non-carcinogenic HI ranged from less than 1 to 5. For the occupational worker scenario, carcinogenic risks ranged from 3×10^{-8} to 2×10^{-5}, and the non-carcinogenic HI was less than 1. The COCs are 1,1- DCA, benzene, chloroform, cis-1,2-DCE, naphthalene, PCE, TCE, and vinyl chloride.

Soil: Releases from leaks in ASTs or USTs and associated piping at PRL S-006 may have impacted the site soil at PRL S-019. In addition, surface releases of pesticide and herbicide compounds in the area surrounding Building 332 at PRL S-019 may have occurred. Soil risks, primarily associated with PCBs, dieldrin, and PAHs, are greater than the risk management range for unrestricted use, and at the high end of the risk management range for restricted use. In addition, the HI for unrestricted use exceeds 1. The carcinogenic risk for the residential scenario is 1×10^{-3}, and the non-carcinogenic HI is 2, due to arsenic, cadmium, and Aroclor-1260. For the occupational worker scenario, the carcinogenic risk is 1×10^{-4}, and the non-carcinogenic HI is less than 1. Lead, PAHs, and PCBs were detected at concentrations greater than levels for protection of surface water quality. The COCs are Aroclor-1260, dieldrin, lead, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene. It should be noted that although PRL S-019 has been combined with CS 040 and PRL S-006, the NTCRA was not conducted at PRL S-019.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 1.2×10^{-4} and may be higher when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for PRL S-019 is industrial. Alternatives VOC2 and Non-VOC4a were selected to address VOCs in SSG that exceed the risk management range for unrestricted use and to address PAHs in soil that exceed the risk management range for industrial use as well as lead, PAHs, and PCBs in soil that pose a threat to surface water quality. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit exposures to VOCs in SSG, because risks are greater than the risk management range for unrestricted use. VOC2 was selected over VOC3 because the risk for SSG does not exceed the risk management range for industrial use.

The combined industrial use target volume under Alternative Non-VOC4a for adjacent sites CS 040, PRL S-006, and PRL S-019 is 12,248 cubic yards, and was selected to remove PAHs in soil that exceed industrial use cleanup levels as well as lead, PAHs, and PCBs in soil that exceed levels protective of surface water quality. The unrestricted use target volume of 17,040 cubic yards under Non-VOC4b was not selected because the future use for CS 040, PRL S-006, and PRL S-019 is industrial, there will be ICs associated with VOC2, and the HI for unrestricted use exceeds 1. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the soil risks exceed the risk management range for unrestricted use and the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

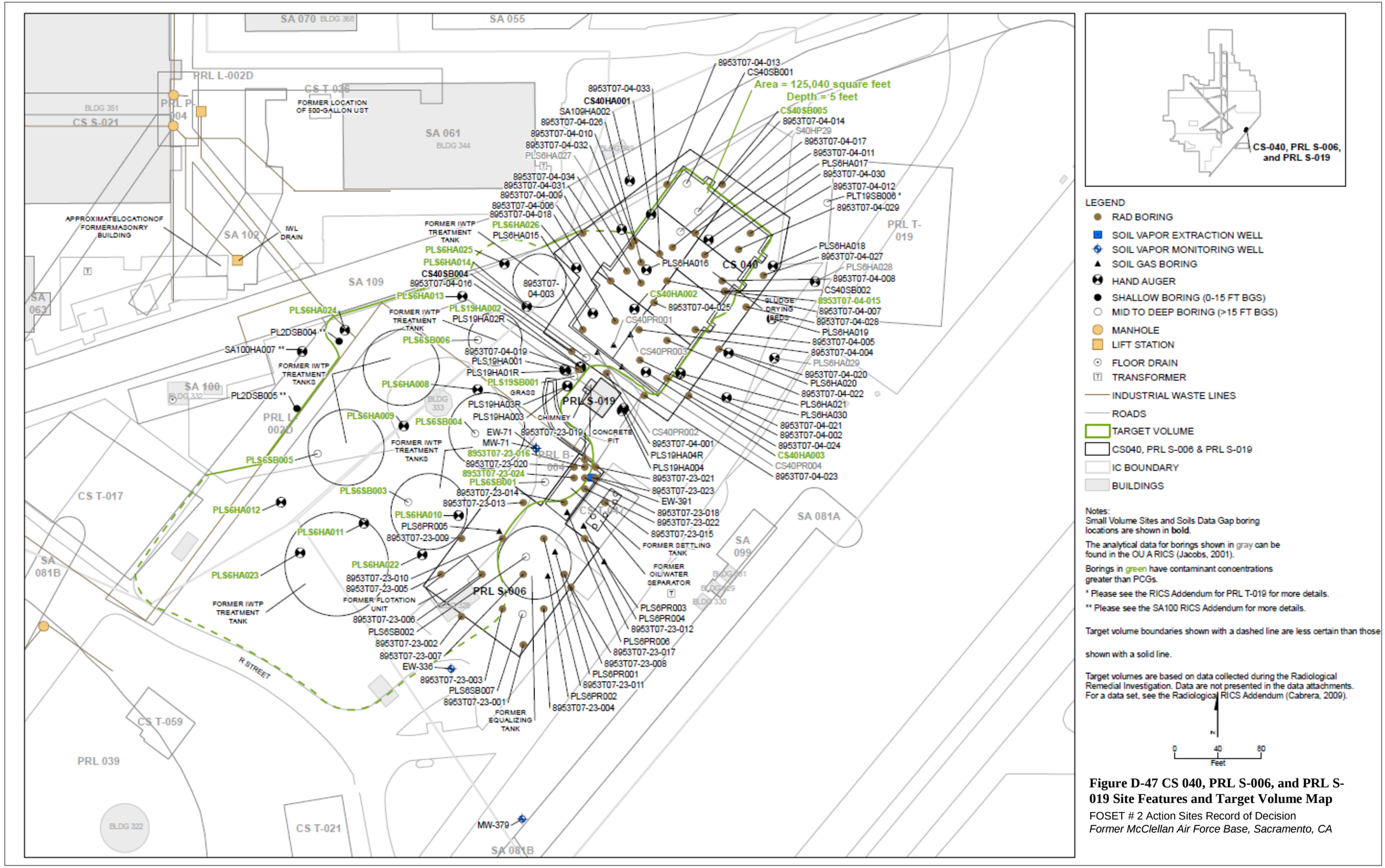

Figure D-47 CS 040, PRL S-006, and PRL S-019 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision

Former McClellan Air Force Base, Sacramento, CA

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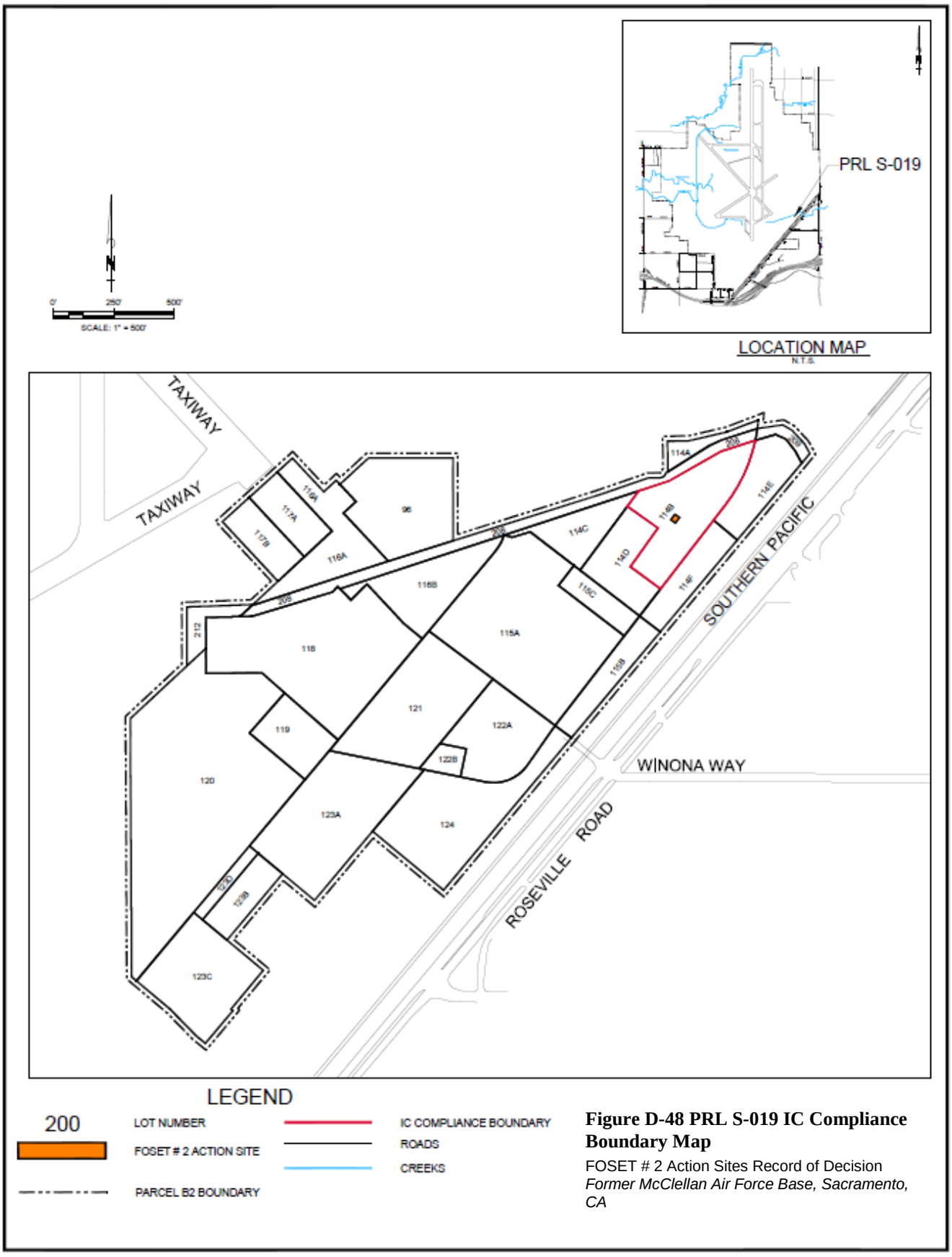

Figure D-48 PRL S-019 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

PRL S-025: This site comprises approximately 0.7 acres and is the location of former Building 440, which housed a transformer shop, a ball-bearing shop, and a rubber repair shop. The ball bearings were cleaned using Stoddard solvent, TCE, and PCE. It was reported that the Stoddard solvent used in the ball-bearing shop was stored in an underground pit on the southeastern side of Building 440. Drains from the rubber repair shop carried liquid waste to a former sump on the western side of Building 440. The depth and type of construction of the former sump is unknown. Building 440, including the foundation, was demolished in 1997. The site is currently covered by gravel.

Selected Remedy: Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: PCBs, TPH-D, and TPH-G in soil

Shallow Soil Gas: Risks are at the low end of the risk management range for unrestricted use and less than the risk management range for restricted use. The carcinogenic risk for the residential scenario ranged from 1×10^{-6} to 5×10^{-6} and is within the risk management range. For the occupational worker scenario, the carcinogenic risk was less than 1×10^{-6}. For both scenarios, the non-carcinogenic HI was less than 1. PRL S-025 is also under the influence of the IC 35 SVE system. No COCs have been identified because of the relatively low concentrations (less than industrial use screening levels) and the limited number of concentrations greater than unrestricted use screening levels (only two detections).

Soil: Transformer oil spills, releases from the sump located just outside the rubber repair shop, or releases from the solvent line and pit have impacted the soil at PRL S-025. Soil risks, driven by PCBs, are within the risk management range for unrestricted use but at the low end of the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. The carcinogenic risks for the residential and occupational worker scenarios are 8×10^{-6} and 1×10^{-6}, respectively. The non-carcinogenic HI for the residential scenario is 2, due to Aroclor-1254, Aroclor-1260, and cadmium, and is less than 1 for the occupational scenario. For both scenarios, the primary drivers of carcinogenic and non-carcinogenic risk were Aroclor-1254 and Aroclor-1260. Aroclor-1260 and Aroclor-1254 were detected at concentrations exceeding the screening levels for protection of surface water. TPH-D and TPH-G exceeded cleanup levels for protection of groundwater. The COCs are Aroclor-1254, Aroclor-1260, TPH-D, and TPH-G.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at PRL S-025.

Rationale for Selected Remedies: The expected future use for PRL S-025 is industrial. Alternative Non-VOC4a was selected to address TPH-D and TPH-G in soil that pose a threat to groundwater quality. The industrial use target volume under Alternative Non-VOC4a is 40 cubic yards, and was selected to remove TPH-D and TPH-G in soil that exceed levels protective of groundwater quality. The unrestricted use target volume of 380 cubic yards under Non-VOC4b was not selected. PCBs exceeded cleanup levels for surface water quality protection and will require ECs where excavation is not planned. The existing surface cover(s) must be maintained by ECs. Due to the need for ECs to require the maintenance of existing surface covers and because the future use for PRL S-025 is industrial, Non-VOC4a was selected over Non-VOC4b. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the unrestricted HI exceeds 1. The ICs require that if the existing surface covers are removed or existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

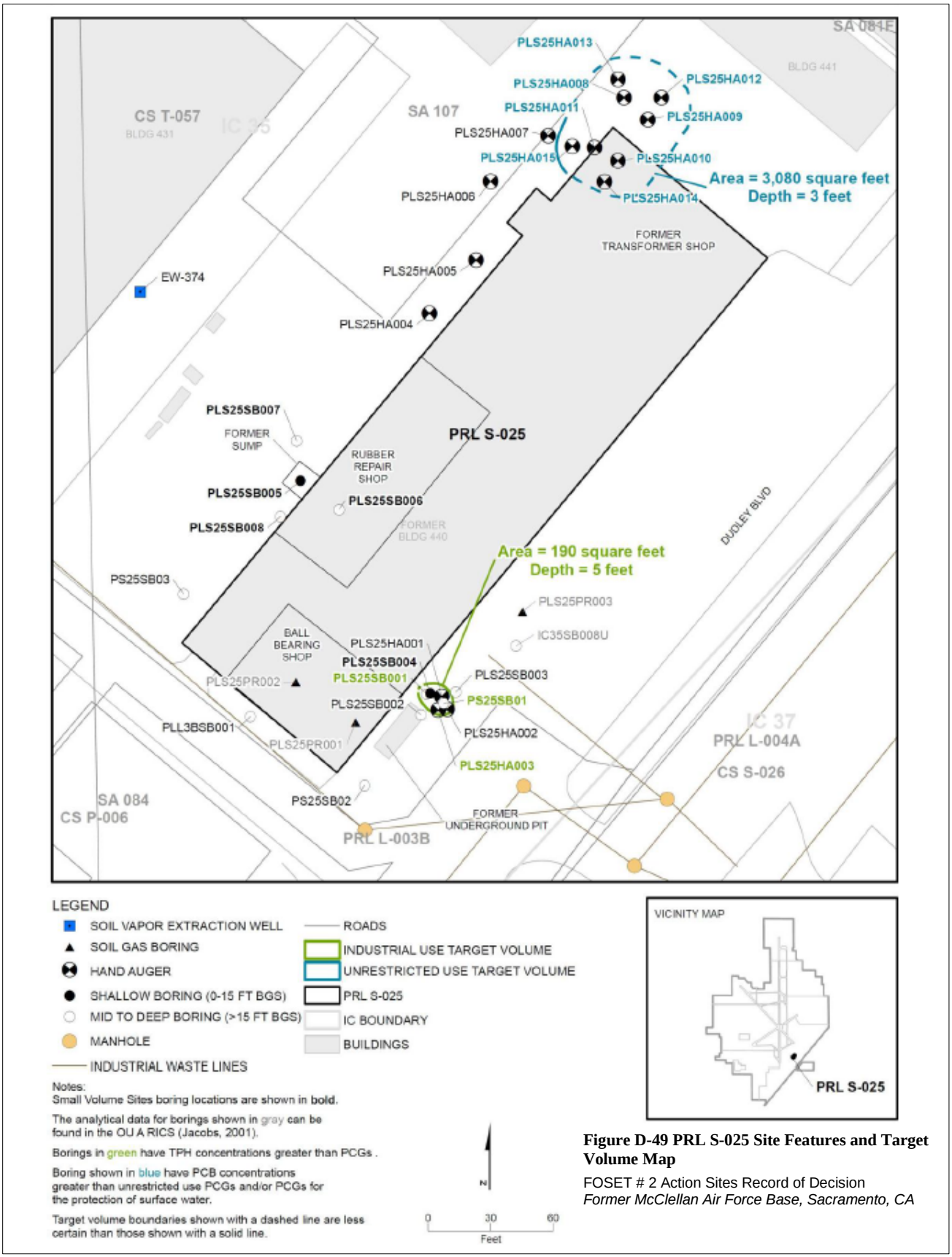

Figure D-49 PRL S-025 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

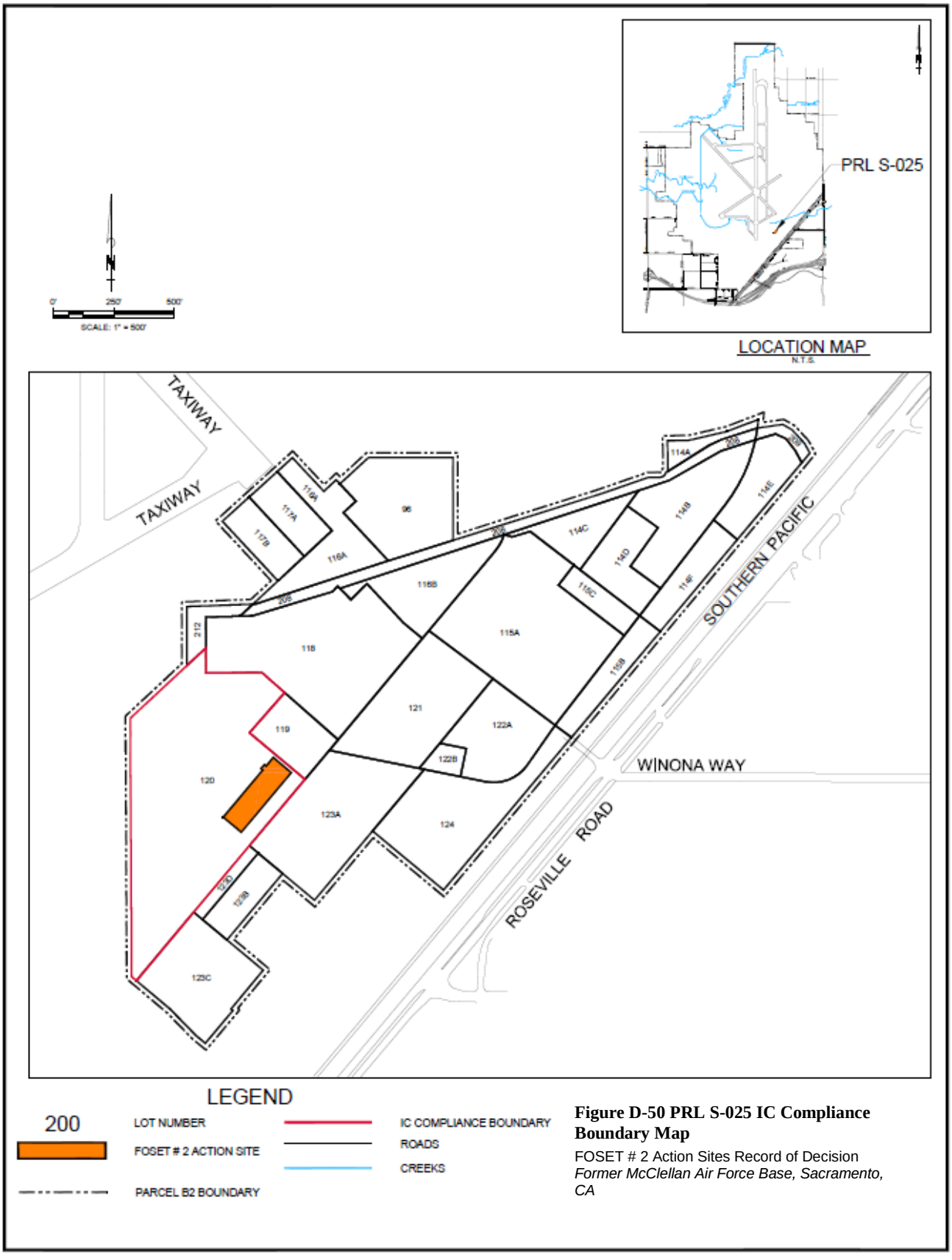

Figure D-50 PRL S-025 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

PRL S-036: This site includes former Building 402 (chemical storage), former Building 410 (garbage truck repair facility), three former 250-gallon diesel and gasoline ASTs, and an oil and automotive fluid drum storage area. Automotive fluids were reportedly spilled onto the concrete pad at former Building 410 during routine maintenance of the garbage trucks. Oil stains were noted during site inspections. The ASTs were removed sometime between 1990 and 1992. The ASTs reportedly leaked from their hoses onto the concrete, asphalt, and soil within the immediate area of the tanks and by the railroad track. The asphalt was observed to be cracked from weathering. Leaks were also reportedly observed at the drum storage area which is now covered in asphalt, except for the northern tip where the asphalt has decomposed and water has been observed to pool.

Selected Remedy: Non-VOC4b (Excavation and Disposal–Unrestricted Land Use)

Contaminants Addressed: PCBs in soil

Shallow Soil Gas: Risks are within the risk management range for both unrestricted use and restricted use. The carcinogenic risk for the residential scenario ranged from 3×10^{-7} to 3×10^{-5}, within the risk management range. For the occupational worker scenario, the carcinogenic risk ranged from 2×10^{-8} to 2×10^{-6}. The non-carcinogenic HIs for both scenarios are less than 1. No COCs have been identified because of the relatively low concentrations (less than industrial use screening levels) and the limited number of concentrations greater than unrestricted use screening levels.

Soil: Spills from building operations, ASTs, and drums have impacted the site soil. Soil risks, driven by PCBs, are at the low end of the risk management range for unrestricted use and less than the risk management range for restricted use; however, the HI for unrestricted use is greater than 1. The carcinogenic risks for the residential and occupational worker scenarios are 5×10^{-6} and 6×10^{-7}, respectively. The non-carcinogenic HI is 8 due to aluminum, thallium, and Aroclor-1260 for residential reuse and less than 1 for the occupational worker scenario. However, PCBs exceed surface water protection cleanup levels. The COC is Aroclor-1260.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at PRL S-036.

Rationale for Selected Remedies: The expected future use for PRL S-036 is industrial. Alternative Non-VOC4b was selected to address Aroclor-1260 in soil that pose a threat to surface water quality. The unrestricted use target volume under Alternative Non-VOC4b is 90 cubic yards, and was selected to remove Aroclor-1260 in soil that exceeds unrestricted use cleanup levels and levels protective of surface water quality. The industrial use target volume under Non-VOC4a was not calculated because no COCs exceed industrial use cleanup levels. Non-VOC4b was selected over Non-VOC4a because a remedy is not needed for shallow soil gas (which would require restrictions), the extent of the soil contamination is well defined, and there will be no need to implement ICs and ECs for the protection of human health and surface water quality once the excavation is complete.

The selected alternative results in unrestricted land use.

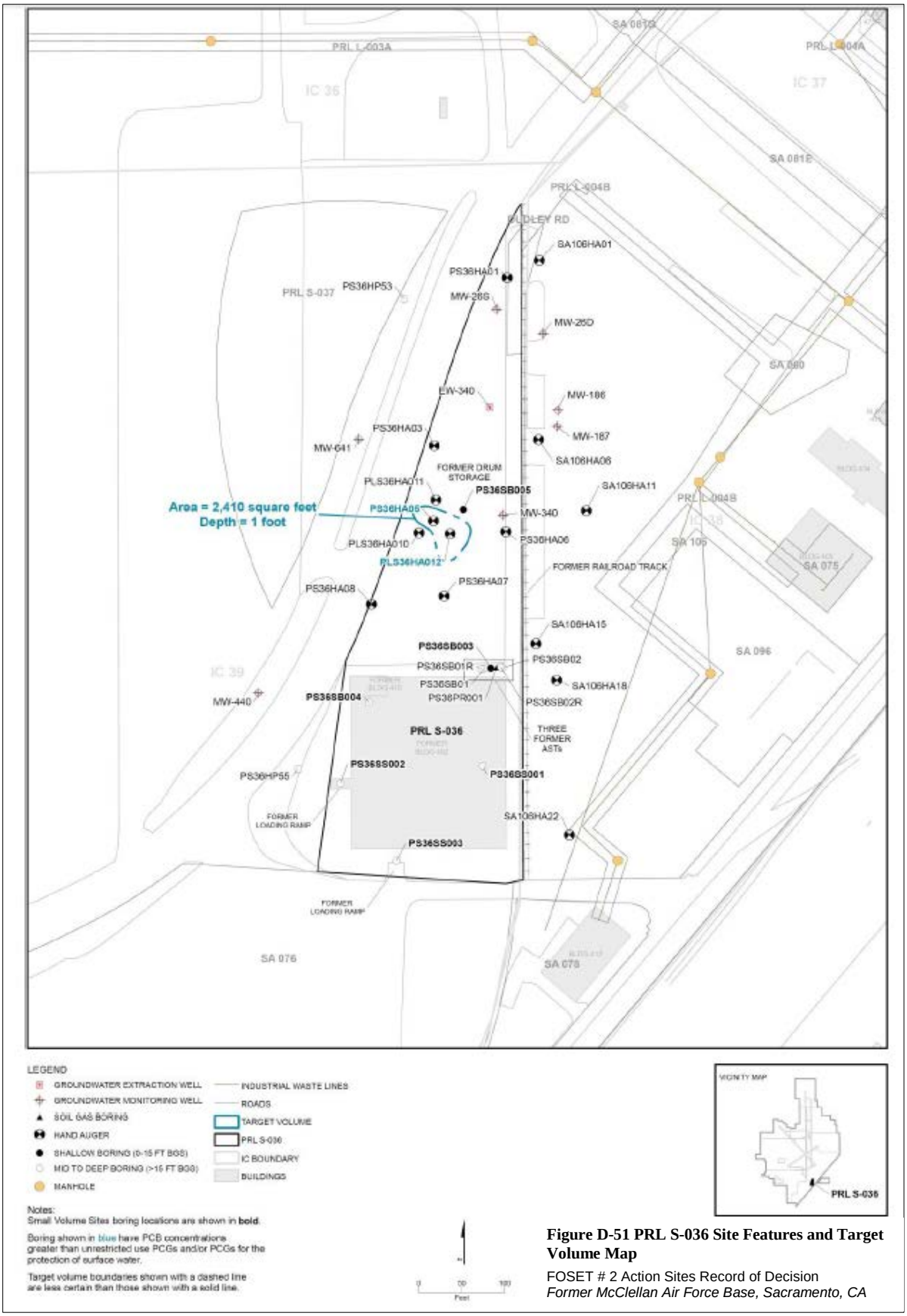

Figure D-51 PRL S-036 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

PRL S-043: This site is the location of a former aircraft washrack located at the northeast corner of MAT V. PRL S-043 consists of a concrete pad with a concrete berm and trench drain system connected to the IWL. An inspection of the site in 1985 revealed extraneous chemicals being stored in containers that were deteriorating or were not securely closed. The exact location where chemicals were stored is unknown.

Selected Remedy: Alternatives VOC2 (ICs), Non-VOC4b (Excavation and Disposal–Unrestricted Land Use)

Contaminants Addressed: VOCs in SSG; PAHs and TPH-G in soil

Shallow Soil Gas: Risks are within the risk management range for unrestricted and restricted use. The carcinogenic risk for the residential scenario ranged from 4×10^{-6} to 4×10^{-5} and from 2×10^{-7} to 2×10^{-6} for the industrial scenario. The non-carcinogenic HIs for both scenarios are less than 1. PCE was detected in shallow soil gas at concentrations above unrestricted and industrial use screening levels. The COC is PCE.

Soil: Releases from the IWL and drainage system have impacted the subsurface soil. Soil risks, driven by PAHs, are greater than the risk management range for unrestricted use and are within the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. The carcinogenic risk for the residential scenario is 2×10^{-4}, and the non-carcinogenic HI is 2, due to arsenic. For the occupational worker scenario, the carcinogenic risk is 2×10^{-5}, and the non-carcinogenic HI is less than 1. PAHs were detected in surface soil samples at concentrations exceeding levels for protection of surface water quality. TPH-G exceeded cleanup levels for protection of groundwater. The COCs are benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-c,d)pyrene, chrysene, and TPH-G.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 2.2×10^{-5} and may exceed 10^{-4} when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for site PRL S-043 is industrial. Alternatives VOC2 and Non-VOC4b were selected to address VOCs in SSG and to address PAHs exceeding the risk management range for unrestricted use and that pose a threat to surface water quality, as well as TPH-G in soil that poses a threat to groundwater quality. Only two locations at PRL S-043 were sampled for SSG, which is insufficient to evaluate the SSG risk and whether vapors are pooling under the building present at PRL-S-043. VOC2 was selected because of these uncertainties. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit potential exposures to VOCs in SSG.

The unrestricted use target volume under Alternative Non-VOC4b is 190 cubic yards, and was selected to remove PAHs and TPH-G in soil that exceed levels protective of surface water and groundwater quality, respectively. The industrial use target volume for Non-VOC4a is the same (190 cubic yards) because the excavation volume is based on the removal of soil for the protection of surface water and groundwater quality. Non-VOC4b was selected over Non-VOC4a because ECs will not be necessary to protect surface water and groundwater quality once the excavation is complete.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

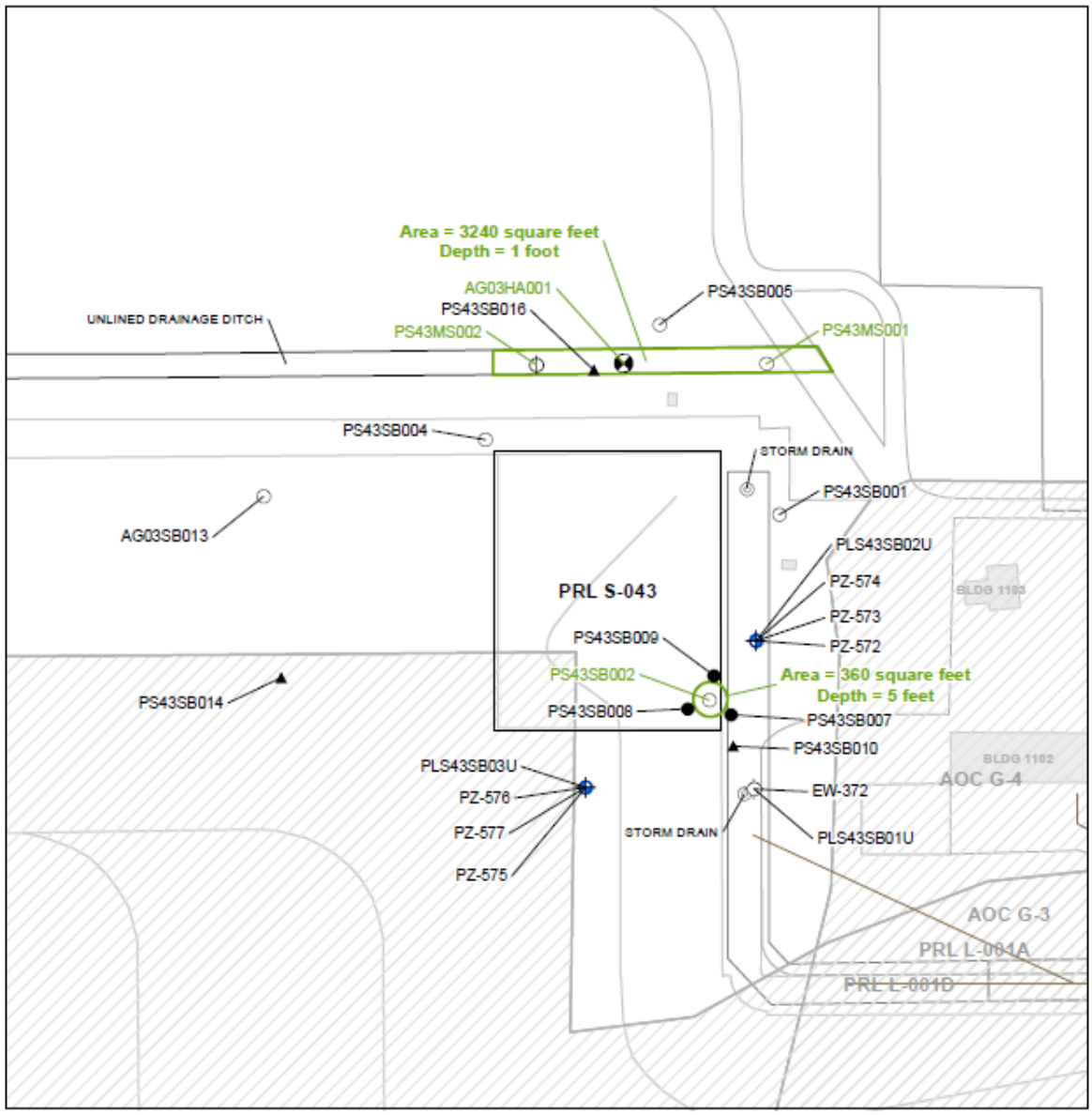

Figure D-52 PRL S-043 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

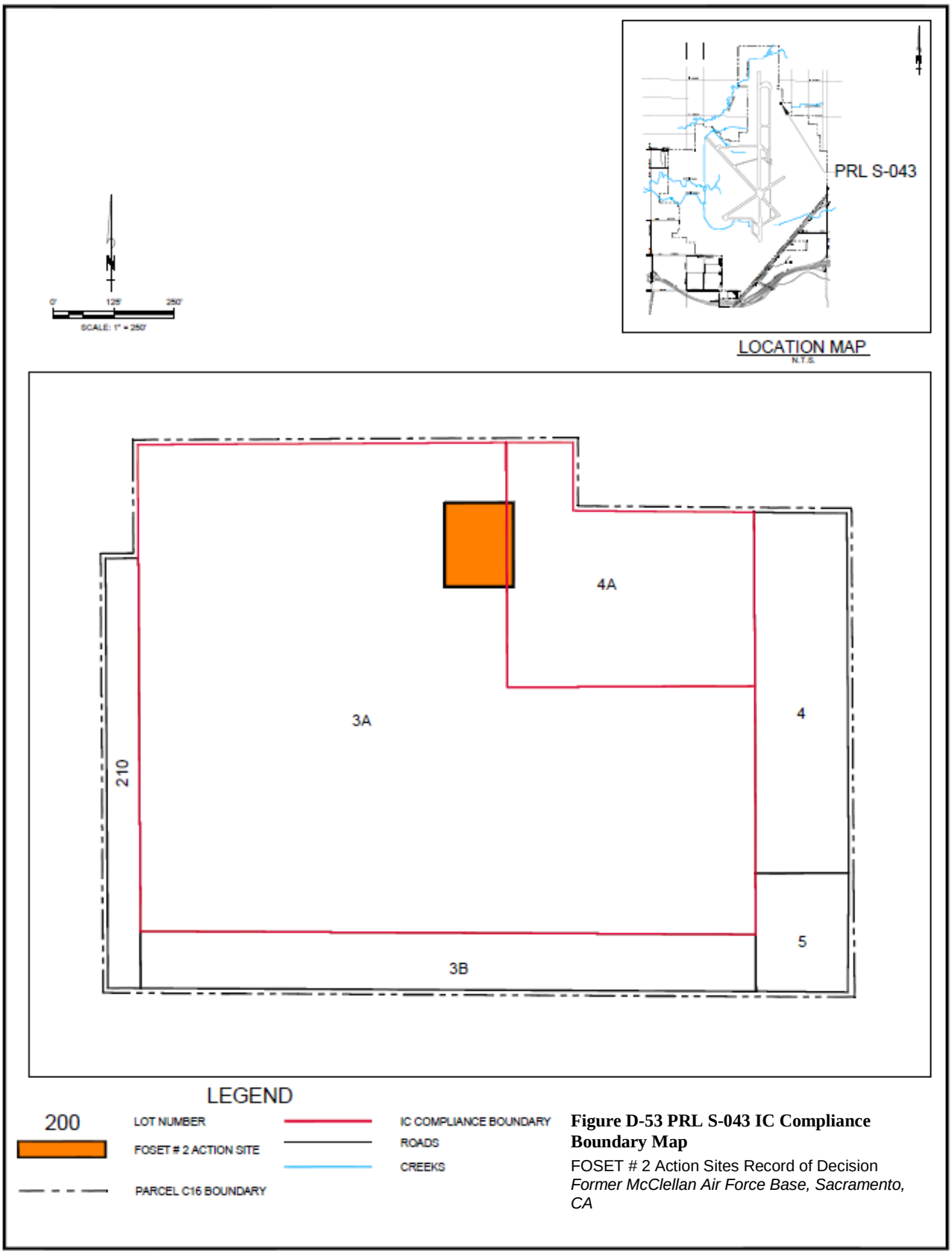

Figure D-53 PRL S-043 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

PRL S-044: This site consists of the southern portion of a paved aircraft parking apron known as MAT U and is approximately 750 feet wide by 1,300 feet long and 18 inches thick. Aircraft maintenance, fueling, washing, painting, and de-painting occurred onsite beginning in 1957. An aircraft wash area was located in the southeastern corner of the site. Four east-west-running petroleum pipelines ran beneath the site. Maintenance hangars line the east side of the site. The west and south sides of the site are bordered by an unlined drainage ditch (PRL P-007). The majority of surface water runoff at the site flows to the west or south into this ditch, with some runoff to the east.

Selected Remedy: Alternatives VOC2 (ICs), Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; PAHs, PCBs, and lead in soil

Shallow Soil Gas: Risks are within the risk management range for unrestricted and restricted use. The carcinogenic risk for the residential scenario ranges from 9×10^{-7} to 2×10^{-5}, and the non-carcinogenic HI is less than 1. For the occupational worker scenario, the carcinogenic risk ranges from 5×10^{-8} to 1×10^{-6} and the HI is less than 1. The concentration of TCE in one sample exceeded the industrial use screening level, while all other shallow soil gas exceedances were greater than the unrestricted use screening level. The COCs are benzene, naphthalene, and TCE.

Soil: Releases from aircraft-related maintenance, painting, or washing have impacted the surface soil. Leaks from the pipelines or IWL have impacted the subsurface soil. Soil risks, driven by PAHs, are greater than the risk management range for unrestricted use and within the risk management range for restricted use. In addition, the HI for unrestricted use exceeds 1. The carcinogenic risk is 6×10^{-4} for the residential scenario and 7×10^{-5} for the occupational worker scenario. The non-carcinogenic HIs for the residential and occupational worker scenarios are 7 (due to thallium and arsenic) and less than 1, respectively. Lead, Aroclor-1260, and several PAHs exceed levels for the protection of surface water quality. The COCs are Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene, and lead.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 7.1×10^{-5} and may exceed 10^{-4} when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for site PRL S-044 is industrial. Alternatives VOC2 and Non-VOC4a were selected to address VOCs in SSG and to address lead, Aroclor-1260, and PAHs in soil that pose a threat to surface water quality. Although risk is within the risk management range for unrestricted use, VOC2 was selected because there are insufficient samples to characterize this 975,000 square foot site (e.g., there are few samples beneath the building footprint). VOC2 was selected over VOC3 because the risk for SSG does not exceed the risk management range for industrial use. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit potential exposures to VOCs in SSG.

The industrial use target volume under Alternative Non-VOC4a is 9,020 cubic yards, and was selected to remove lead, Aroclor-1260, and PAHs in soil that exceed the levels protective of surface water quality in the area addressed by the target volume. The unrestricted use target volume of 16,350 cubic yards under Non-VOC4b was not selected; however this volume also includes lead, Aroclor-1260, and PAHs in soil that exceed the levels protective of surface water quality. ECs are needed to address COCs in surface soil that will not be excavated. The existing surface cover(s) must be maintained by ECs. If the existing cover(s) are removed, sampling must be done, a surface cover must be maintained, or other ECs implemented, as warranted. Based on the need for ECs and the future use for PRL S-044, Non-VOC4a was selected over Non-VOC4b. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the soil risks exceed the risk management range for unrestricted use and the HI for unrestricted use exceeds 1. The ICs require that if existing buildings

on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

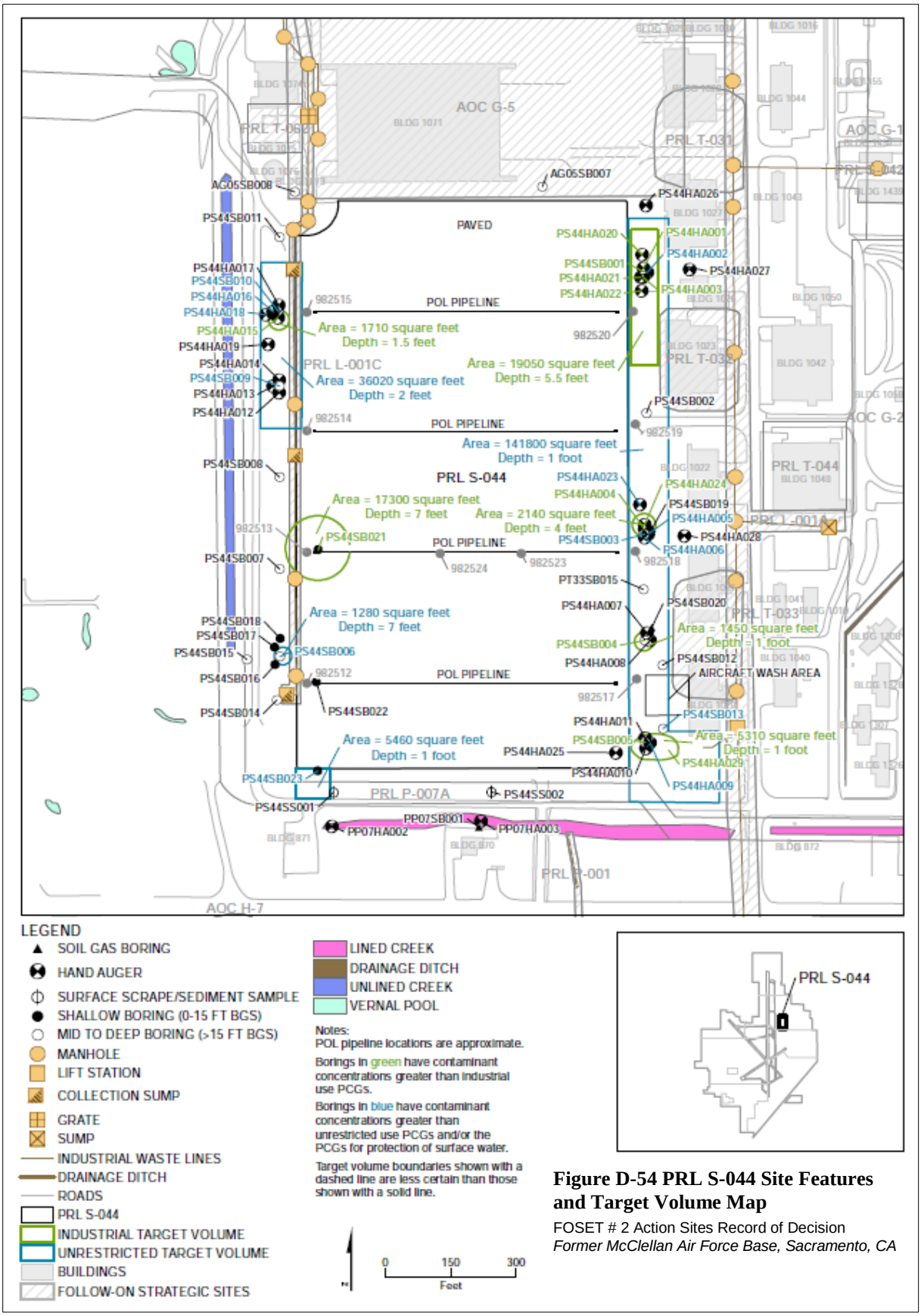

Figure D-54 PRL S-044 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

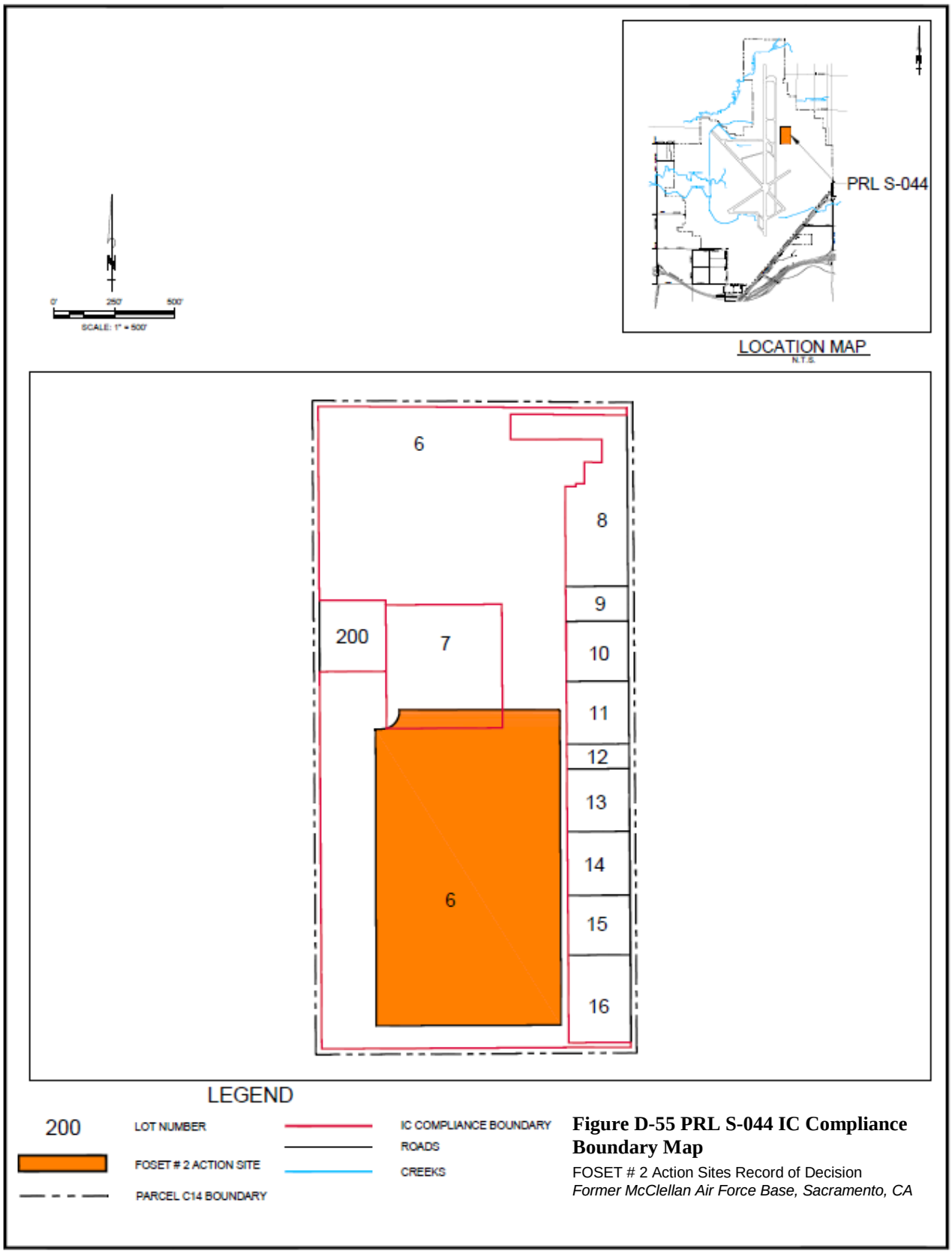

Figure D-55 PRL S-044 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

PRL S-045: This site consists of a paved apron (Apron 7310) and two aircraft hangars (Buildings 877 and 878) and is also known as MAT C. Routine aircraft maintenance was performed on the apron and in the hangars from 1964 to 1992. Waste oil and hydraulic fluid were collected in bowsers and transferred to 55-gallon drums stored in the hazardous waste staging area in the northeastern portion of the apron. Storm drain inlets were placed on the western and southern sides of the apron in the areas with exposed soil. Spills prior to 1987 were washed into the storm drains by the McClellan AFB Fire Department. Materials handled in Buildings 877 and 878 included cleaning solvents, lubricants, oils, gasoline, and paint. There is a transformer located on the southeastern corner of each building. A 250-gallon diesel AST, installed around 1996, is located on the southern side of Building 877 in a bermed area. A 1,000-gallon AST is currently located just north of Building 878 in an un-bermed area. An OWS is located northeast of Building 878. This OWS has not been granted closure.

Selected Remedy: Alternatives VOC2 (ICs), Non-VOC4b (Excavation and Disposal–Unrestricted Land Use)

Contaminants Addressed: VOCs in SSG; PAHs and PCBs in soil

Shallow Soil Gas: Risks are within the risk management range for unrestricted use and less than the risk management range for restricted use. The carcinogenic risks for the residential scenario range from 1×10^{-7} to 1×10^{-5}, and the non-carcinogenic HIs are less than 1. Risk drivers for the carcinogenic risk under the residential scenario include 1,2-DCA, benzene, chloroform, and naphthalene. For the occupational worker scenario, the carcinogenic risk is less than the risk management range, and the HI is less than 1. The COCs are 1,2-DCA, benzene, chloroform, and naphthalene.

Soil: Spills and leaks to the ground surface from a hazardous materials storage area, ASTs, transformers, and various aircraft maintenance activities have impacted the surface soil. Leaks from the sump and OWS have impacted the subsurface soil. Soil risks are within the risk management range for both unrestricted use and restricted use. In addition, the HI for unrestricted use is greater than 1. The carcinogenic risk is 6×10^{-5} for the residential scenario and 4×10^{-6} for the occupational worker scenario. The non-carcinogenic HIs for the residential and occupational worker scenarios are 2 (due to arsenic and vanadium) and 0.07, respectively. PCBs and PAHs exceeded surface water protection cleanup levels. The COCs are benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and Aroclor-1254, and Aroclor-1260.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 4.7×10^{-6} and may exceed 10^{-4} when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for site PRL S-045 is industrial. Alternatives VOC2 and Non-VOC4b were selected to address VOCs in SSG and to address PAHs and PCBs in soil that exceed the unrestricted HI of 1 and pose a threat to surface water quality. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit potential exposures to VOCs in SSG because there were only two SSG samples collected in proximity to PRL S-045 and neither of these samples was collected beneath the building. VOC2 was selected over VOC3 because the risk for SSG does not exceed the risk management range for industrial use.

The unrestricted use target volume under Alternative Non-VOC4b is 660 cubic yards, and was selected to remove PAHs and PCBs in soil that exceeds levels protective of surface water quality. The industrial use target volume under Non-VOC4a was not calculated because no COCs exceed industrial use cleanup levels. Non-VOC4b was selected over Non-VOC4a because there will be no need to implement ECs for the protection of surface water quality once the excavation is complete.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

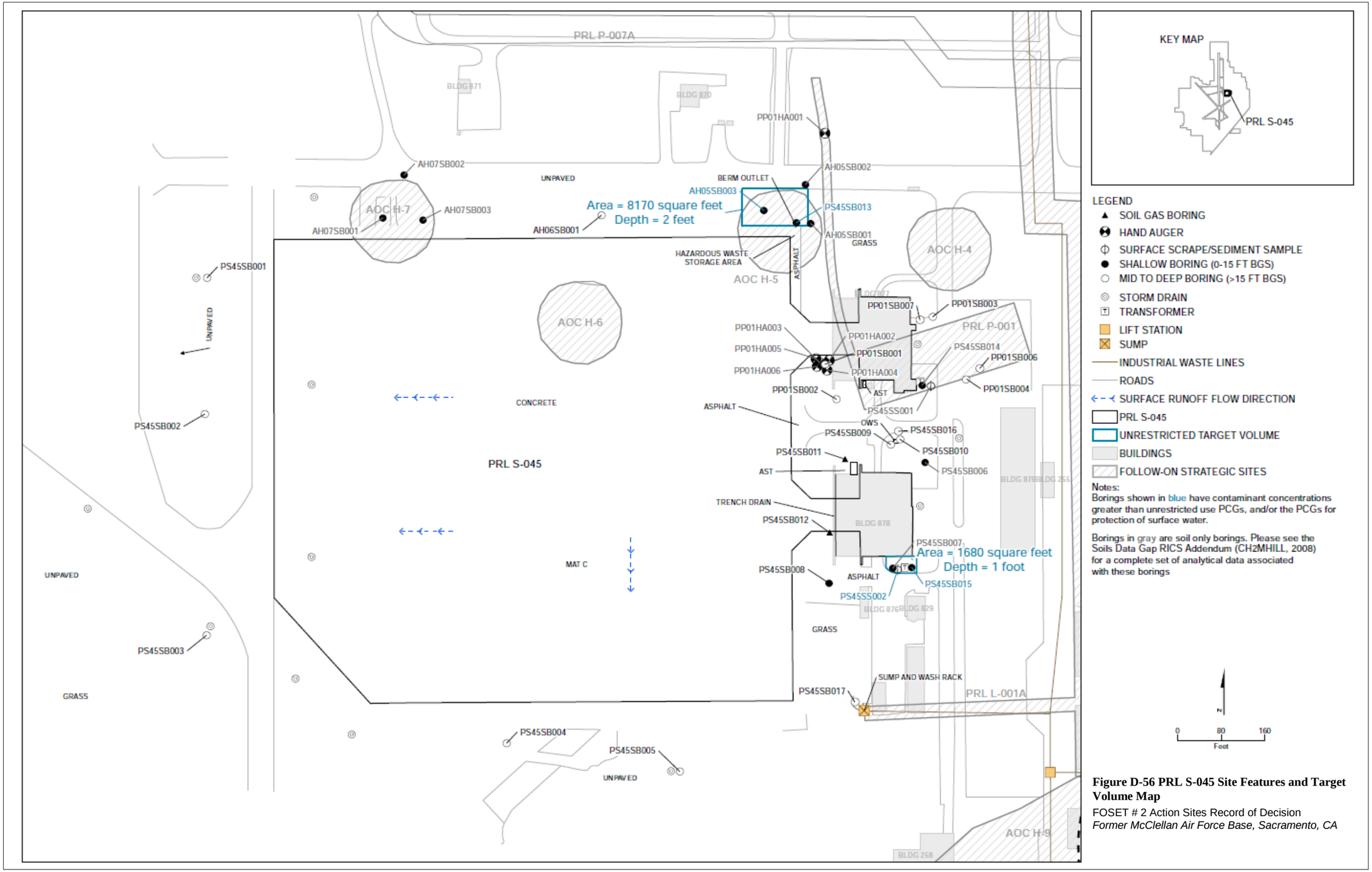

Figure D-56 PRL S-045 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

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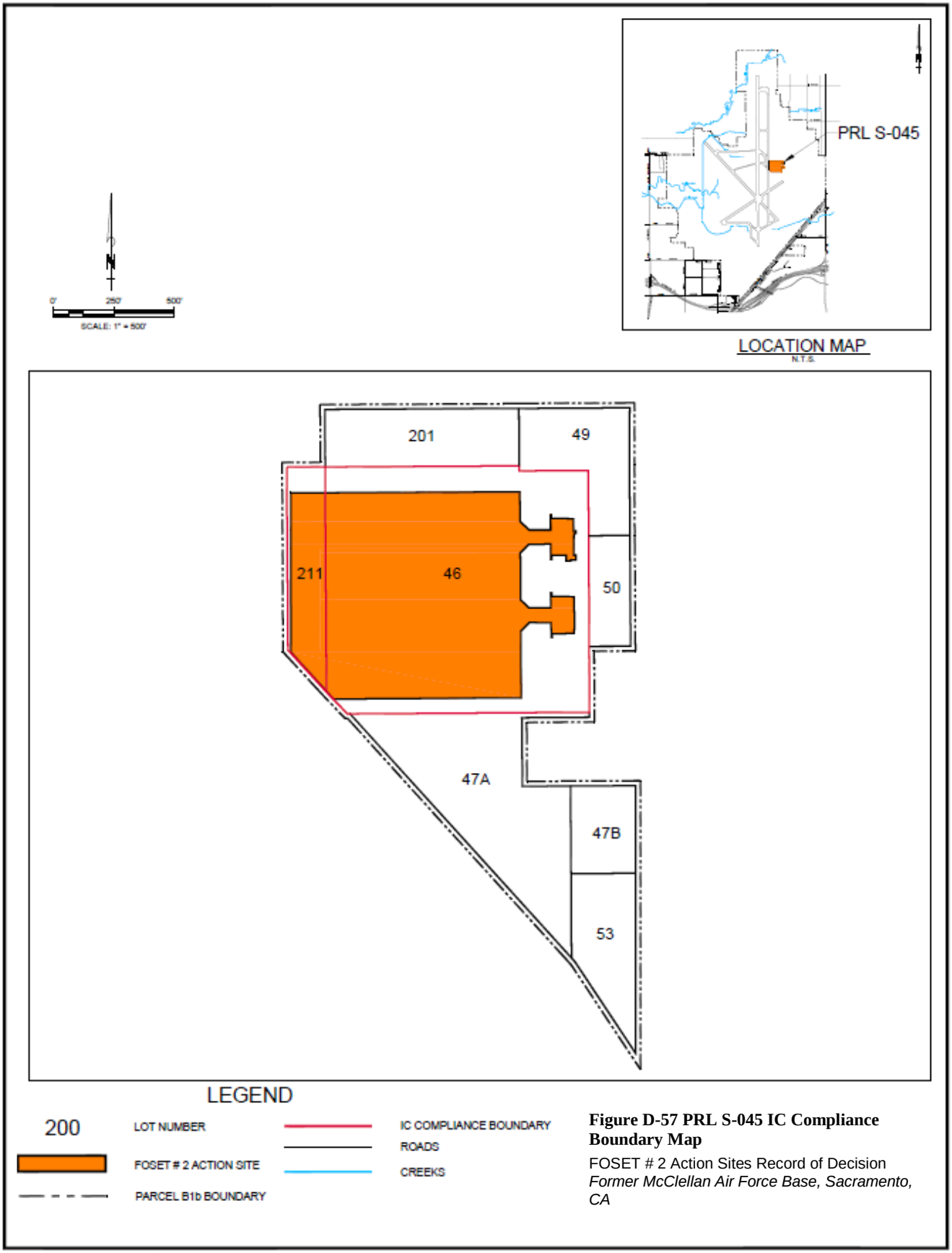


Figure D-57 PRL S-045 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

PRL T-032: This site is the location of Building 1023, which served as a hangar for light maintenance activities. Two 550-gallon USTs just south of Building 1023 were removed in 1987, and received closure from the Central Valley Water Board on March 6, 1998. Building 1023 was constructed with five floor drains to collect wastes generated during maintenance activities. A portion of the IWL (PRL L-001) runs along the eastern sited of Building 1023.

Selected Remedy: Alternatives VOC3 (ICs/ECs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; PAHs, TPH-D, and TPH-G in soil

Shallow Soil Gas: Risks are within the risk management range for unrestricted and restricted use; however, the HI is greater than 1 for both use scenarios. The carcinogenic risk for the residential scenario ranges from 5×10^{-5} to 6×10^{-5}. For the occupational worker scenario, the carcinogenic risk ranges from 3×10^{-6} to 4×10^{-6}. The non-carcinogenic HIs range from 9 to 60 for the residential scenario and range from less than 1 to 4 for the occupational worker scenario. The COCs are 1,2,4-TMB, 1,3,5-TMB, benzene, ethylbenzene, m,p-xylene, methylene chloride, and naphthalene.

Soil: Releases from the former USTs and leaks from the floor drains and/or sanitary sewer related to the maintenance activities have impacted the site soil. Soil risks are greater than the risk management range for unrestricted use and within the risk range for restricted use. In addition, the HI for unrestricted use is greater than 1. The carcinogenic risk is 3×10^{-4} for the residential scenario and 2×10^{-5} for the occupational worker scenario. The non-carcinogenic HIs are 6, due to arsenic, vanadium, and naphthalene, and less than 1 for the residential and occupational worker scenarios, respectively. TPH-D and TPH-G concentrations are above the levels for protection of groundwater and surface water quality. The COCs are 1-methylnaphthalene, benzo(a)pyrene, naphthalene, TPH-D, and TPH-G.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 2.4×10^{-5} and may exceed 10^{-4} when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for site PRL T-032 is industrial. Alternatives VOC3 and Non-VOC4a were selected to address VOCs in SSG that exceed the HI of 1 for industrial use and to address TPH-D and TPH-G in soil that poses a threat to both surface water and groundwater quality. VOC3 was selected over VOC2 because the HI exceeds 1 not only for residential use, but also for industrial use, and restricted use alone will not be sufficient to protect workers. In addition, soil gas samples were only collected from one location at PRL T-032, which is insufficient to characterize SSG contamination. The ICs and ECs established by Alternative VOC3 will restrict the use of the site and require the installation of engineered controls in any future buildings or during significant remodeling of existing buildings to mitigate the potential for VOCs in SSG from migrating into buildings and impacting occupants via the vapor inhalation pathway. The parcels and lots affected by the IC compliance buffer for Alternative VOC3 are Parcel C14, Lots 6, 12, 13, and 14; and Parcel A4, Lots 22 and 23.

The industrial use target volume under Alternative Non-VOC4a is 5,080 cubic yards, and was selected to remove TPH-D and TPH-G in soil that exceeds levels protective of surface water and groundwater quality. The existing surface cover(s) must be maintained by ECs. The unrestricted use target volume for Non-VOC4b is the same (5,080 cubic yards) because concentrations of PAHs that are greater than unrestricted use cleanup levels are co-located with TPH concentrations that exceed levels for protection of surface water and groundwater quality. Non-VOC4a was selected over Non-VOC4b because uncertainties remain with regard to the lateral extent of contamination and to prohibit sensitive reuse. The ICs require that if the existing surface covers are removed or existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other

soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

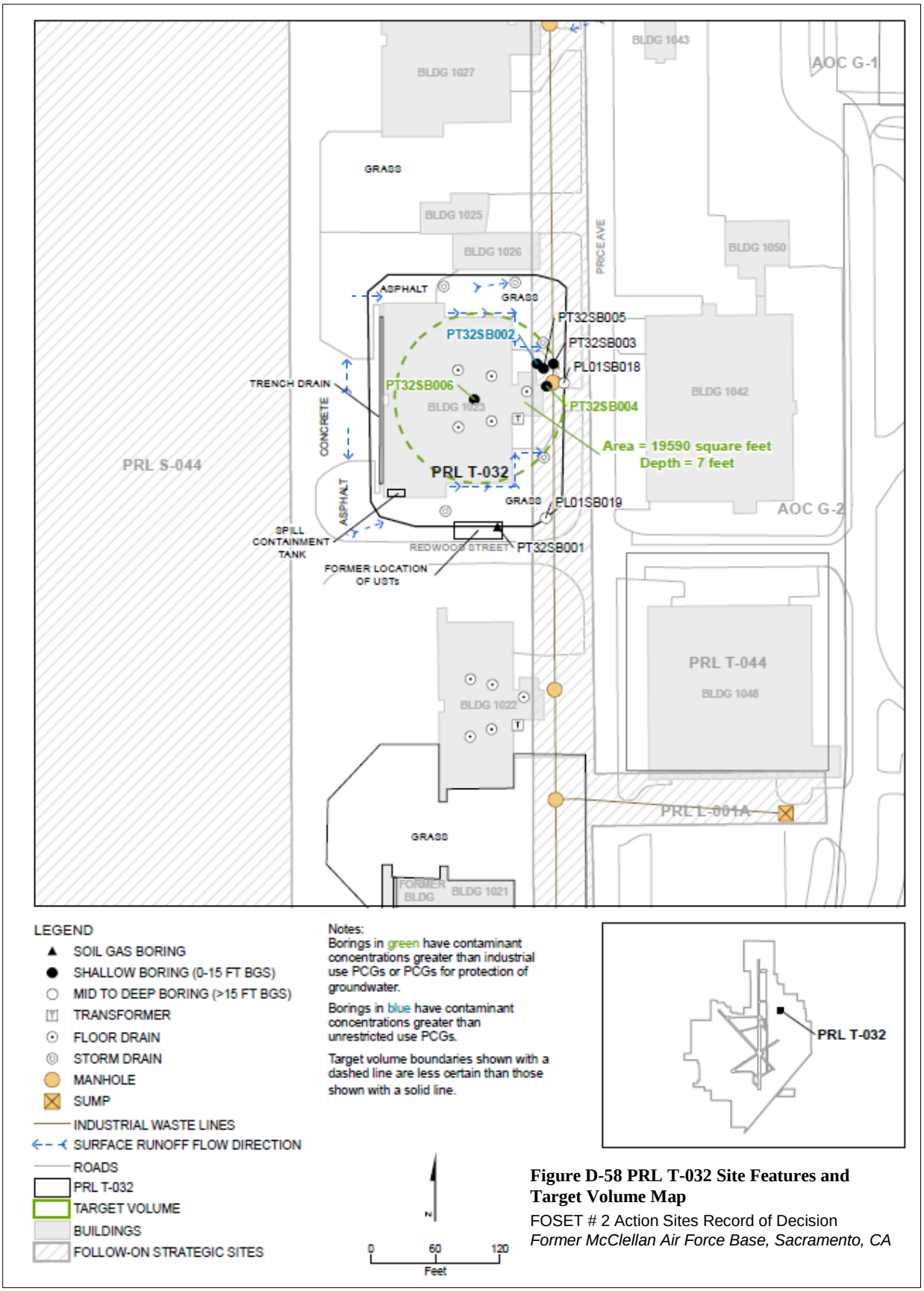


Figure D-58 PRL T-032 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision

Former McClellan Air Force Base, Sacramento, CA

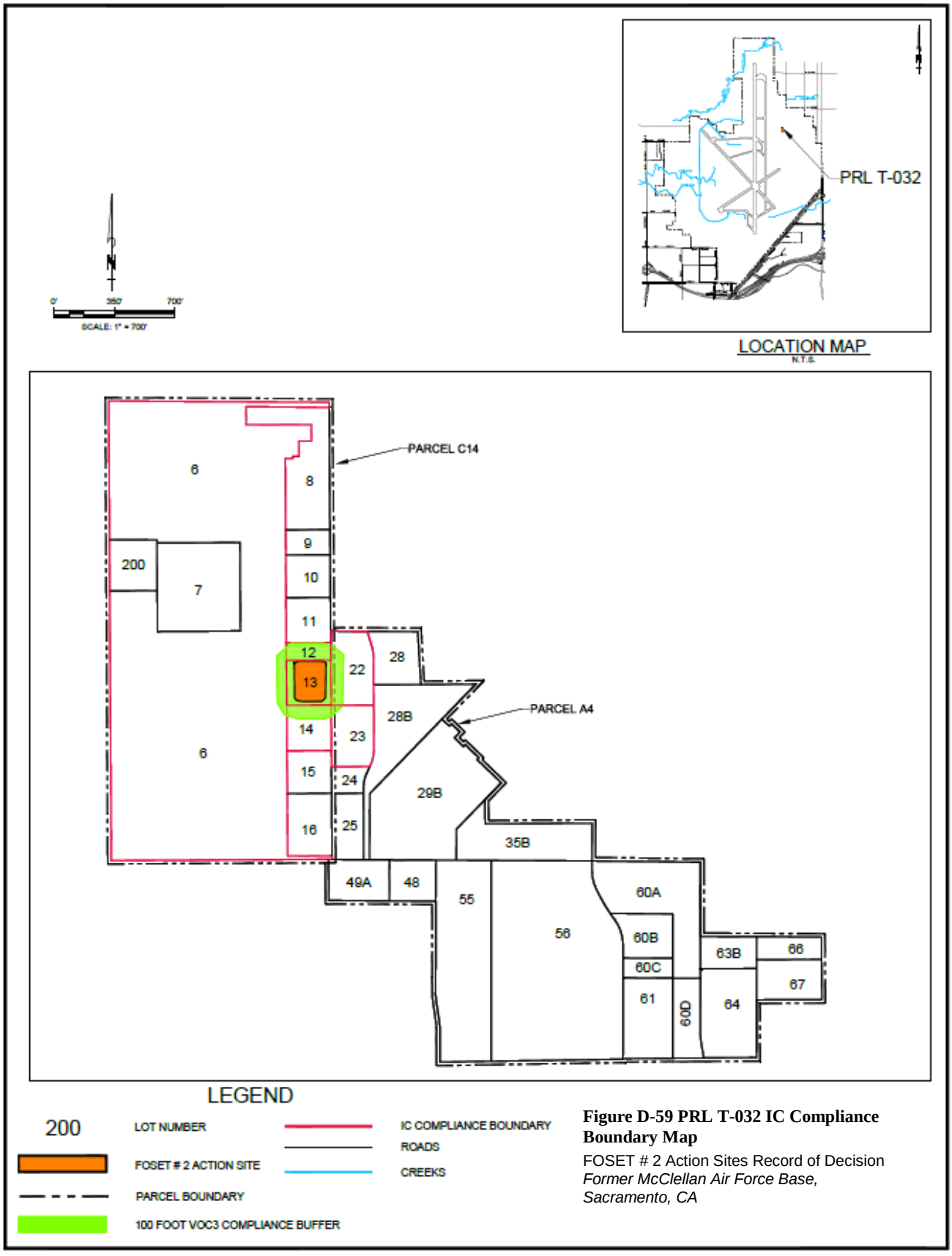


Figure D-59 PRL T-032 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

SA 004: This site is the former location of Building 650 (aircraft parts storage, paint booths, and radar equipment installation) and two outdoor storage areas west of the building. Building 650 did not contain floor drains, had a concrete floor, and the surrounding area is paved except for the railroad tracks that run north-south, located immediately west of the building. A small paved hazardous waste staging area, immediately west of Building 650B, was used to store empty containers, soiled rags, and waste paper and chemicals from the paint shop. An unpaved storage area, located 350 feet west of Building 650D, was used to store electrical transformers. This area was found to contain PCB contamination during the Phase I RI. The boundary of SA 004 was extended to include this area. In 1994, this area was excavated as part of the OU B1 interim remedial action. Contaminated soils were excavated to a depth of 1.5 feet bgs and were consolidated with other PCB-contaminated soils and placed beneath the cap constructed at OU B1. The PCB source area was backfilled and covered by an asphalt cap after excavation was performed to remove PCB-contaminated soils. The final remedy for the OU B1 site was selected in the Parcel C-6 ROD (EPA, 2009) and successfully implemented.

Selected Remedy: Alternatives VOC2 (ICs), Non-VOC4b (Excavation and Disposal–Unrestricted Land Use)

Contaminants Addressed: VOCs in SSG; PCBs in soil

Shallow Soil Gas: Risks are greater than the risk management range for unrestricted use and within the risk management range for restricted use. In addition, the HI for unrestricted use exceeds 1. The carcinogenic risk for the residential scenarios ranges between 2×10^{-7} and 3×10^{-4}. For the occupational worker scenario, the carcinogenic risk ranges between 1×10^{-8} and 2×10^{-5}. The non-carcinogenic HIs for the residential and occupational worker scenarios ranged from less than 1 to 3 and less than 1, respectively. The highest carcinogenic risks and non-carcinogenic HIs for both scenarios are driven by PCE. The COCs are naphthalene, 2-methylnaphthalene, and PCE.

Soil: Leaks or spills from stored electrical transformers, the loading dock, and hazardous waste storage area west of Building 650B have impacted the site soil. Soil risks, driven by PCBs, are greater than the risk management range for unrestricted and within the risk management range for restricted use. The HI values exceed 1 for both use scenarios. The carcinogenic risks for the residential and occupational worker scenarios are 4×10^{-4} and 5×10^{-5}, respectively. The non-carcinogenic HIs are 58, due to Aroclor-1260, for the residential scenario and 3, due to Aroclor-1260, for the occupational worker scenario. Aroclor-1260 was detected at a concentration greater than the level for protection of surface water. The COC is Aroclor-1260.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 7×10^{-5} and may exceed 10^{-4} when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for site SA 004 is industrial. Alternatives VOC2 and Non-VOC4b were selected to address VOCs in SSG that exceed the risk management range for unrestricted use and to address Aroclor-1260 in soil that exceeds the risk management range for unrestricted use and poses a threat to surface water quality. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit exposures to VOCs in SSG, because risks exceed the both the risk management range and the HI of 1 for unrestricted use. VOC2 was selected over VOC3 because the risk for SSG does not exceed the risk management range for industrial use.

The unrestricted use target volume under Alternative Non-VOC4b is 30 cubic yards, and was selected to remove Aroclor-1260 in soil that exceeds levels protective of human health and surface water quality. The industrial use target volume under Non-VOC4a is the same (30 cubic yards). Non-VOC4b was selected over Non-VOC4a because ECs will not be needed to protect surface water once the excavation is complete.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

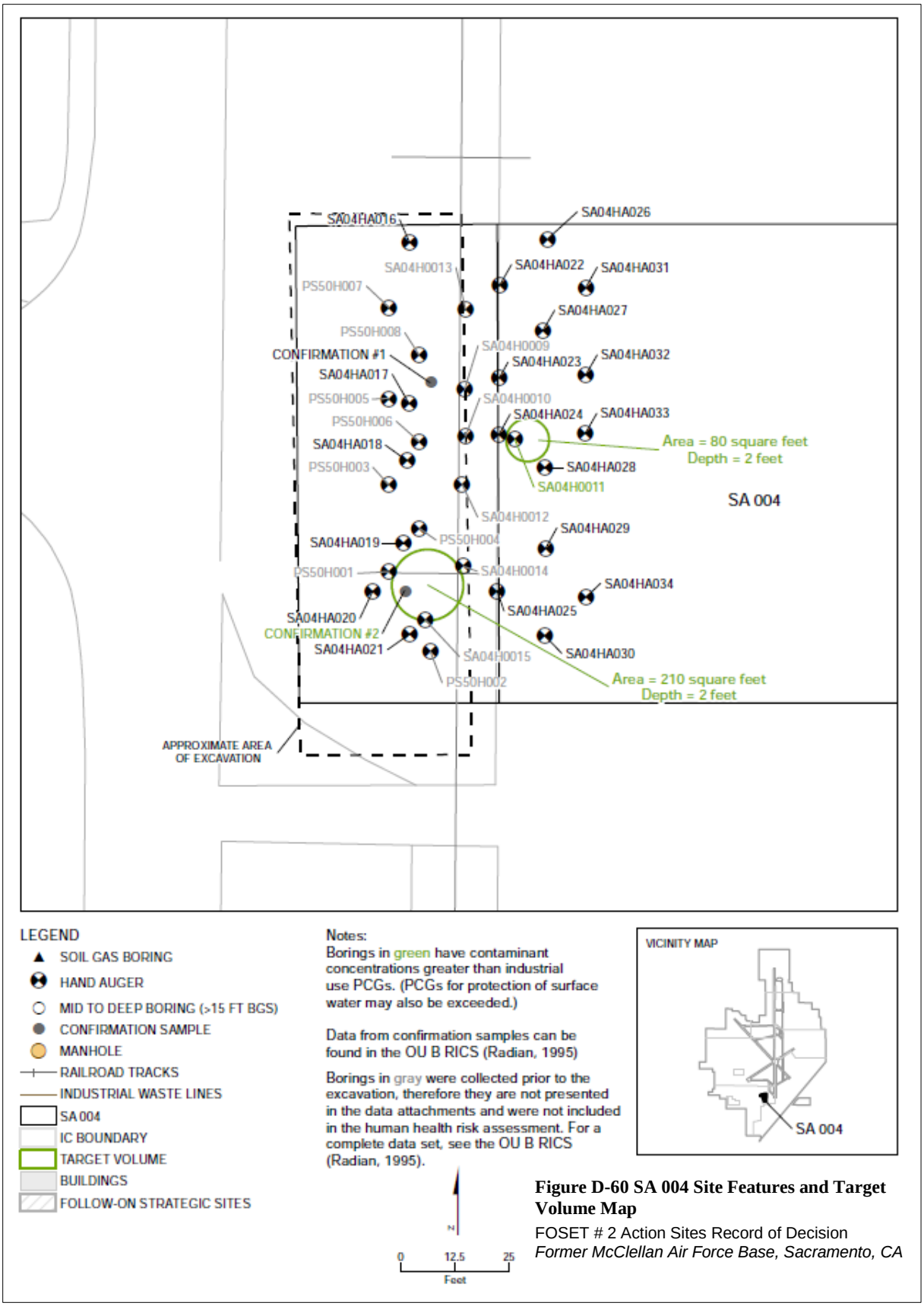


Figure D-60 SA 004 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

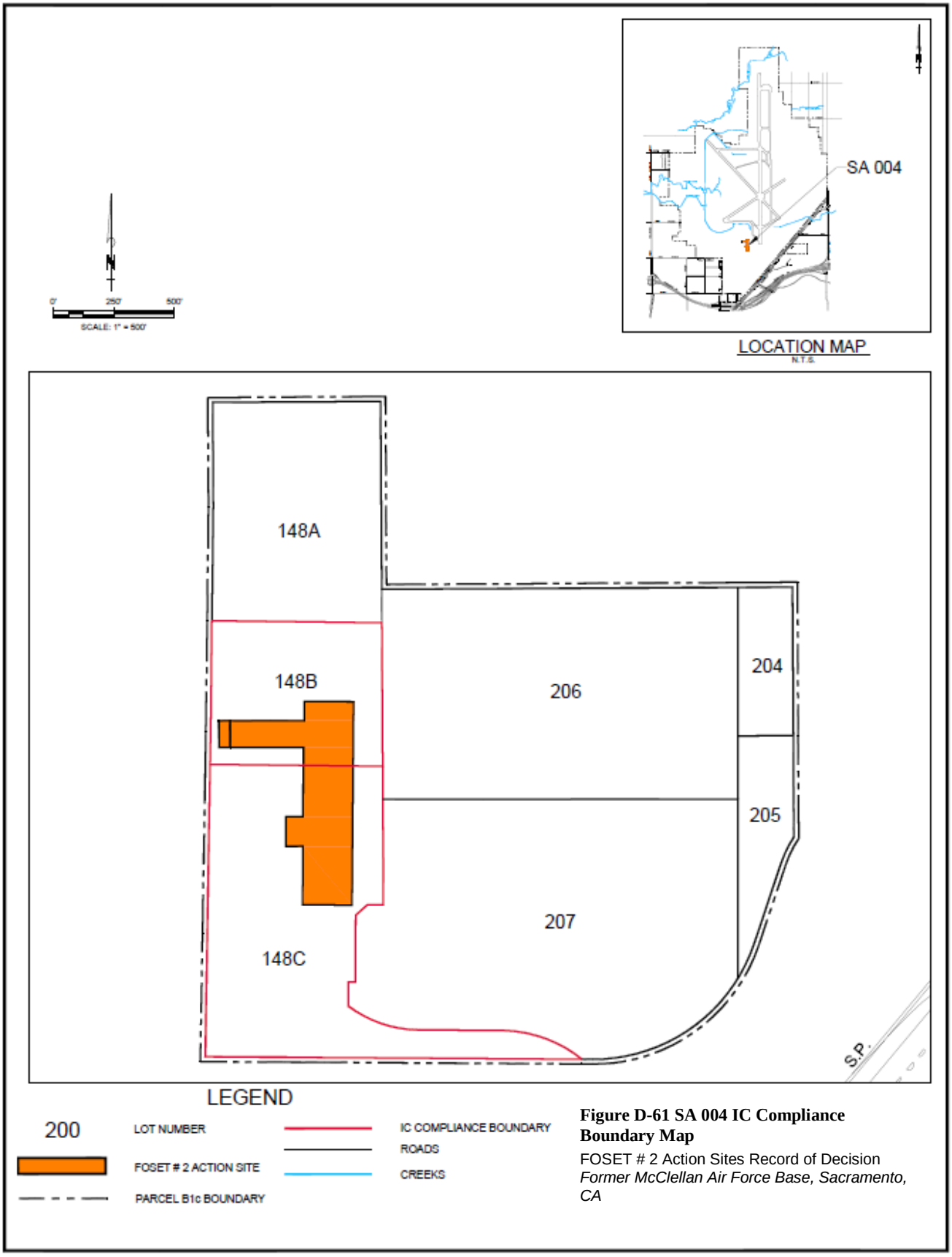


Figure D-61 SA 004 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

SA 045: This site consists of Building 339 (barracks, administrative offices, and the Western Field Office) and is the former location of a 500-gallon diesel UST. A transformer was also located northeast of Building 339. The UST was removed in 1988. Soil samples collected during the UST excavation showed contamination by diesel constituents. The visible contaminated soil was removed, and the excavated area was backfilled with clean soil. The UST has not yet been granted closure status.

Selected Remedy: Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: PAHs, TPH-D, and TPH-G in soil

Shallow Soil Gas: Risks are within the risk management range for unrestricted use and less than the risk management range for restricted use. The carcinogenic risks for the residential scenario range from 2×10^{-7} to 9×10^{-6}. Carcinogenic risks for the occupational worker scenario are less than 1×10^{-6}. Total non-carcinogenic HIs are less than 1 for both scenarios. SA 045 is within the radius of influence of the IC 27 SVE system. No COCs have been identified because the site is considered sufficiently characterized and data do not indicate an ongoing source of VOC contamination in the area.

Soil: Leaks from the UST and associated piping have impacted the subsurface soil. Soil risks, driven by PAHs, are within the risk management range for both unrestricted use and restricted use. In addition, the HI for unrestricted use exceeds 1. The carcinogenic risk for the residential scenario is 5×10^{-5} and the non-carcinogenic HI is 8, due to aluminum, thallium, 2-methylnaphthalene, and naphthalene. For the occupational worker scenario, the estimated carcinogenic risk is 3×10^{-6} and the HI is less than 1. TPH-D and TPH-G exceeded groundwater protection cleanup levels. The COCs are naphthalene, TPH-D, TPH-G, 1-methylnaphthalene, and 2-methylnaphthalene.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at SA 045.

Rationale for Selected Remedies: The expected future use for site SA 045 is industrial. Alternative Non-VOC4a was selected to address TPH-D and TPH-G in soil that pose a threat to groundwater quality. The industrial use target volume under Alternative Non-VOC4a is 2,180 cubic yards, and was selected to remove TPH-D and TPH-G in soil that exceeds levels protective of groundwater quality. The unrestricted use target volume under Non-VOC4b is the same (2,180 cubic yards) because the concentrations of PAHs in soil that are greater than cleanup levels are co-located with TPH concentrations that exceeded levels for protection of groundwater excavation; separate target volumes for unrestricted and industrial use were not calculated. Non-VOC4a was selected over Non-VOC4b because there is some uncertainty regarding the presence of TPH contamination beneath the southern end of Building 339 and because the future use for SA 045 is industrial. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

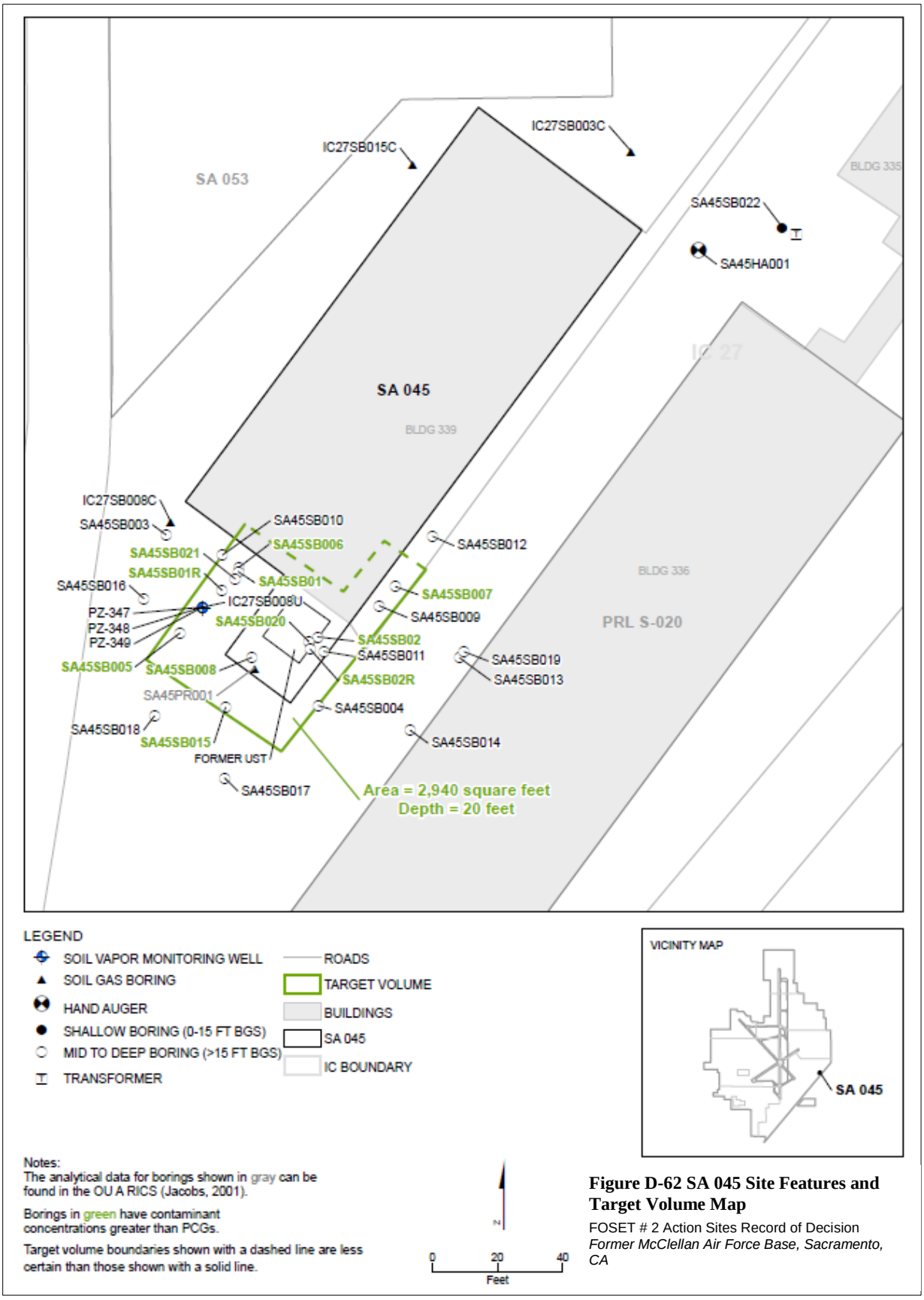


Figure D-62 SA 045 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

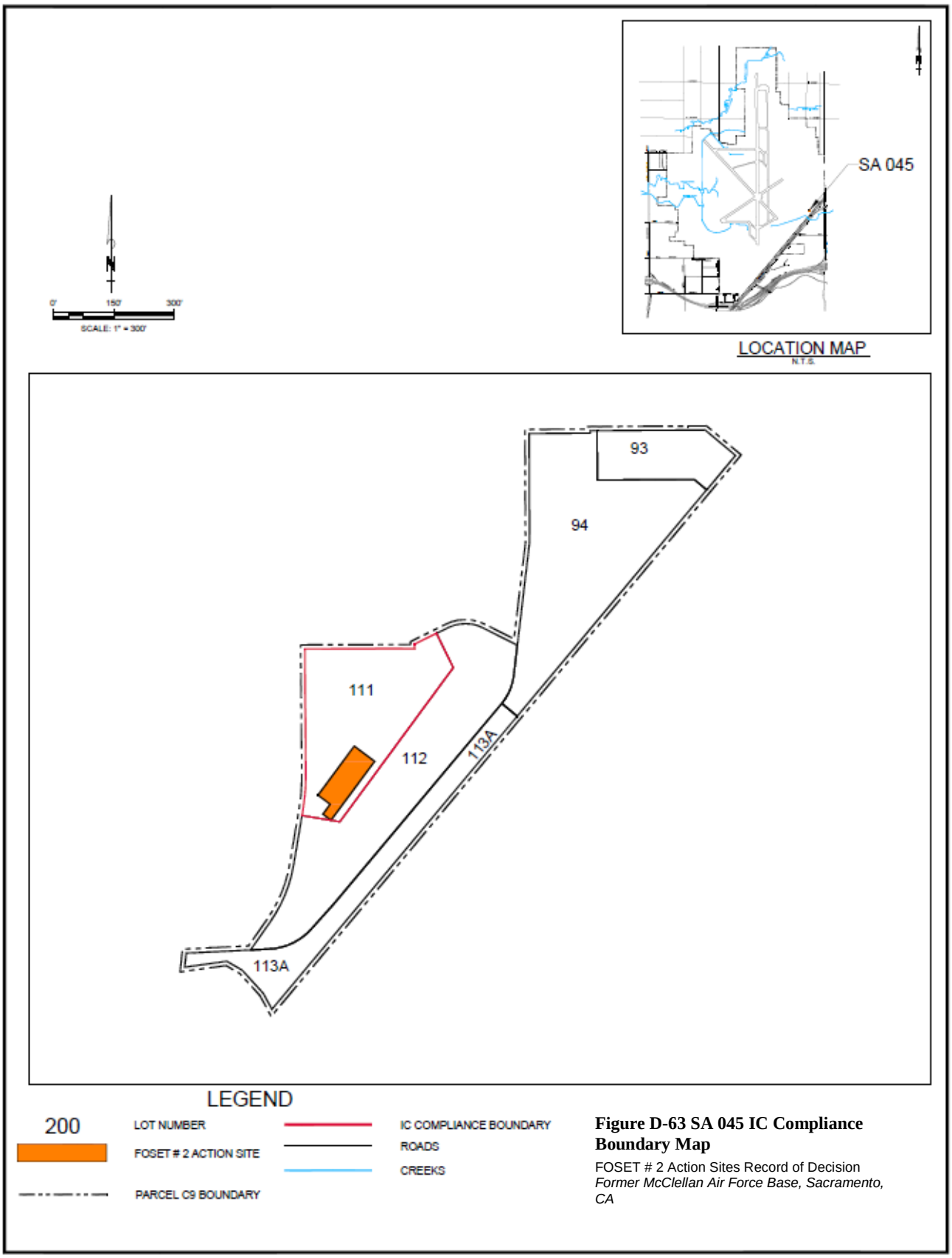


Figure D-63 SA 045 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

SA 049: This site includes Buildings 262A (administrative work area) and 262B (power-generating plant) and the former and present locations of several USTs and ASTs (storing diesel, sodium hydroxide, and oil). A former 20,000-gallon diesel UST operated from 1965 until 1992 and was removed and replaced by a 10,000-gallon diesel UST. The 20,000-gallon UST was granted NFA status by the Central Valley Water Board in 1996, while the 10,000-gallon UST has been in use since 1992. A 1,000-gallon UST in the southeastern corner of Building 262B was in use from 1965 to 1986 for the storage of sodium hydroxide and diesel. The 1,000-gallon UST was abandoned in place in 1986 and has not been granted closure status. Five 275-gallon ASTs are located within Building 262B. Four ASTs store diesel, and one stores lube oil. These ASTs have been in use since 1968. A 1,000-gallon mobile hazardous waste bowser tank on the east side of Building 262B was reportedly used, though the dates of operation are unknown and the bowser is no longer present. An UST of unknown size and contents southwest of Building 267 (west of building 263) was abandoned in place in 1988. The location of this abandoned UST has not been confirmed. The active USTs and ASTs provide fuel for power and lubrication of the generators in Building 262B. The ASTs in Building 262B are in a bermed area that has spill prevention trenches, but no drains. The bermed area also housed 55-gallon drums containing hazardous materials.

Selected Remedy: Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: PAHs and PCBs in soil

Shallow Soil Gas: No VOCs were detected in SSG at SA 049; therefore, no COCs have been identified.

Soil: Spills from the ASTs, drums of stored materials, batteries, and power-generation equipment have impacted the surface soil. Releases from USTs and associated piping have impacted the subsurface soil. Soil risks, driven by PCBs and PAHs, are at the high end of the risk management range for unrestricted and within the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. The carcinogenic risk is 1×10^{-4} for the residential scenario and 8×10^{-6} for the occupational worker scenario. The non-carcinogenic HI for the residential scenario is 5, due to arsenic, thallium, and Aroclor-1260, and for the industrial scenario is less than 1. PAHs and Aroclor-1260 were detected in shallow soils at concentrations exceeding levels for protection of surface water quality. The COCs are PCBs (Aroclor-1260), benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at SA 049.

Rationale for Selected Remedies: The expected future use for site SA 049 is industrial. Alternative Non-VOC4a was selected to address PAHs and Aroclor-1260 in soil that pose a threat to surface water quality in the area addressed by the target volume. The industrial use target volume under Alternative Non-VOC4a is 20 cubic yards, and was selected to remove PAHs and Aroclor-1260 in soil that exceed levels protective of surface water quality. The unrestricted use target volume of 240 cubic yards under Non-VOC4b was not selected because it does not address all of the areas with samples exceeding levels protective of surface water quality. ECs are needed to protect surface water quality due to the soils that will remain in place. The existing surface cover(s) must be maintained by ECs. If the existing cover(s) are removed, sampling must be done, a surface cover must be maintained, or other ECs implemented, as warranted. Due to the need for ECs, and because the future use is expected to be industrial, Non-VOC4a was selected over Non-VOC4b. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

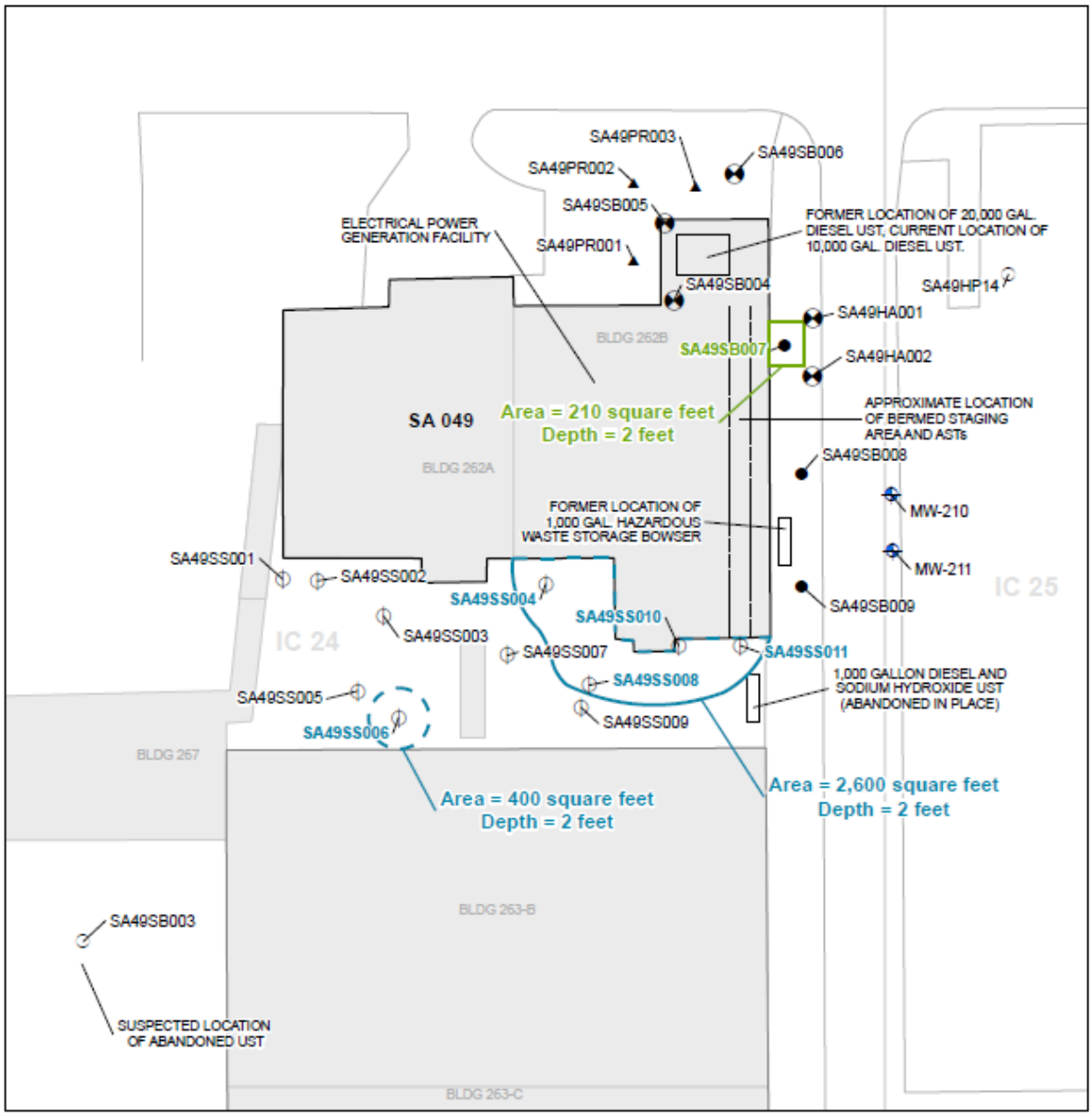


Figure D-64 SA 049 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

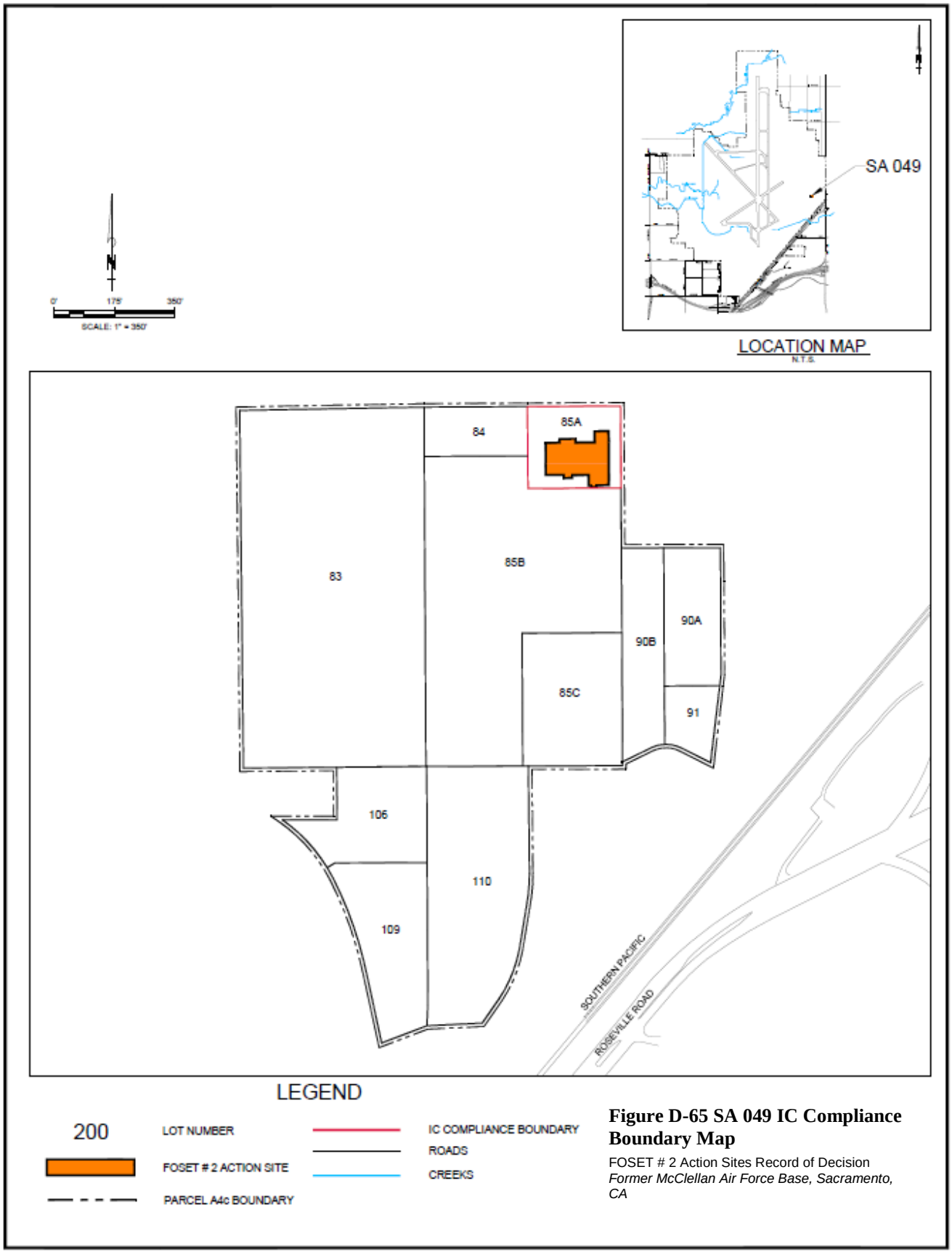


Figure D-65 SA 049 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

SA 055: This 0.92-acre site is the location of Building 324 and former Building 340. Buildings 324 and 340 were built in 1960 and were asphalt-paved, open-sided and bermed laboratory waste staging areas. Compounds stored at SA 055 include fuels, oils, solvents, cyanide, paints, acids, bases, oil containing PCBs, and metals. The entire site currently consists of an asphalt-paved parking lot and Building 324.

Selected Remedy: Non-VOC4b (Excavation and Disposal–Unrestricted Land Use)

Contaminants Addressed: Lead and PCBs in soil

Shallow Soil Gas: Risks are within the risk management range for both unrestricted use and restricted use. The carcinogenic risk for the residential scenario ranges from 2×10^{-7} to 3×10^{-5}, and the non-carcinogenic HI is less than 1. For the occupational worker scenario, the risk ranges from 1×10^{-8} to 2×10^{-6}, and the HI is less than 1. SA 055 is also within the radius of influence of the IC 29 SVE system. No COCs have been identified because only a small volume of soil has been impacted by VOCs and the extent has been defined.

Soil: Spills from the storage of hazardous materials have impacted the surface soil. Soil risks are at the low end of the risk management range for unrestricted use and less than the risk management range for restricted use; however, the HI for unrestricted use is greater than 1. The carcinogenic risks for the residential scenario and occupational scenario are 1×10^{-6} and 1×10^{-7}, respectively. The non-carcinogenic HIs for the residential scenario and occupational scenario are 5, due to thallium, and less than 1 respectively. Lead was detected above the unrestricted cleanup level, but below the restricted cleanup level. Lead and Aroclor-1260 were detected above cleanup levels for surface water quality protection, and are considered COCs.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at SA 055.

Rationale for Selected Remedies: The expected future use for site SA 055 is industrial. Alternative Non-VOC4b was selected to address lead and Aroclor-1260 in soil that pose a threat to surface water quality. The unrestricted use target volume under Alternative Non-VOC4b is 30 cubic yards, and was selected to remove lead and PCBs in soil that exceed levels protective of surface water quality. The industrial use target volume under Non-VOC4a was not calculated because no COCs exceed industrial use cleanup levels. Non-VOC4b was selected over Non-VOC4a because there will be no need to implement ICs or ECs for the protection of human health and surface water quality once the excavation is complete.

The selected alternative results in unrestricted land use.

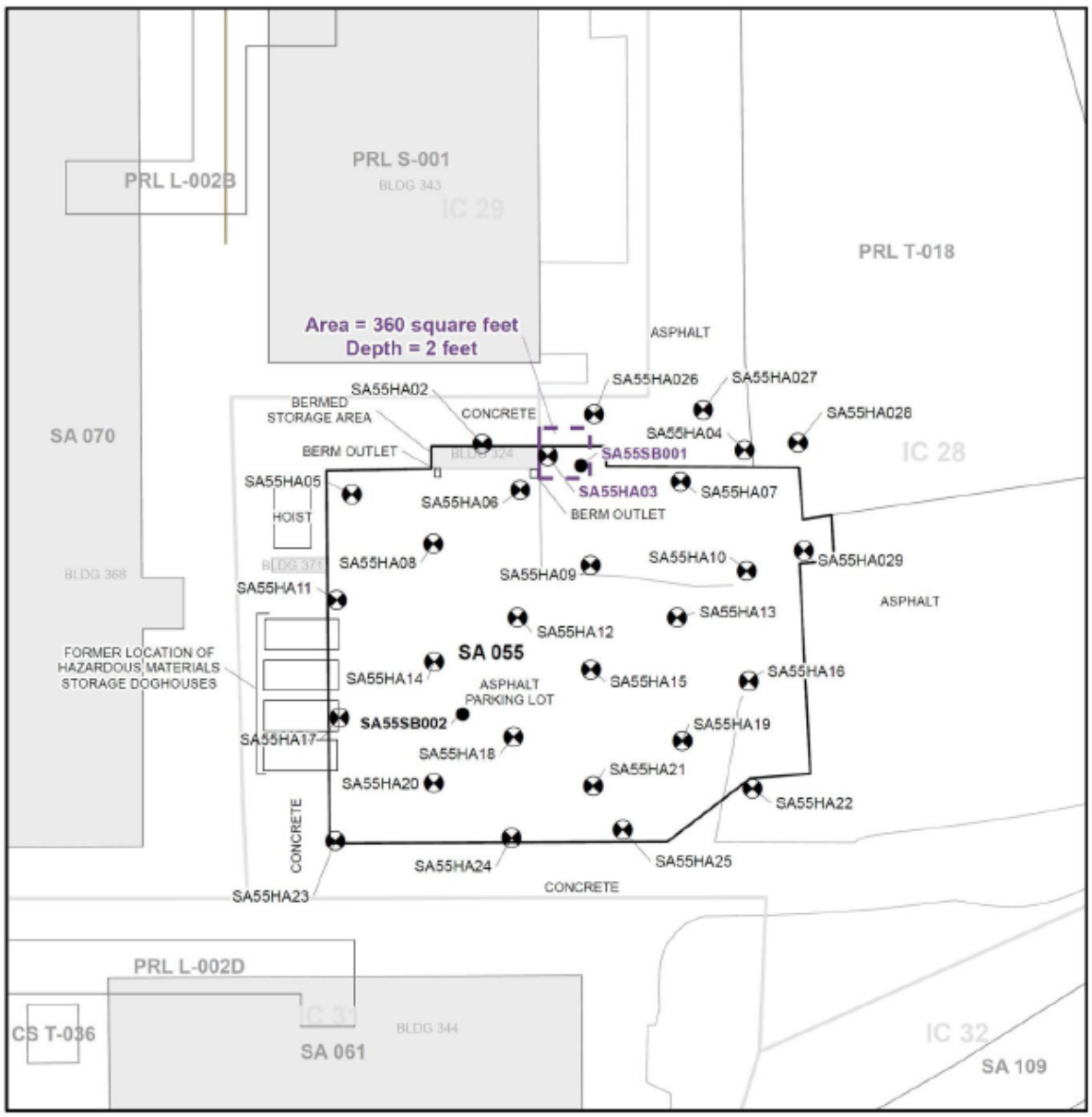


Figure D-66 SA 055 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

SA 060: This 3,500 square foot site is the former location of a vehicle washrack that consisted of a concrete slab area with an IWL drain in the center of the wash area. Wash water normally flowed to the IWL drain; however, if the drain clogged, wash water would flow toward the bare soil adjacent to SA 060. Discolored soil was present north of the washrack area. The washrack is currently abandoned.

Selected Remedy: Non-VOC4a (Excavation and Disposal–Restricted Land Use)

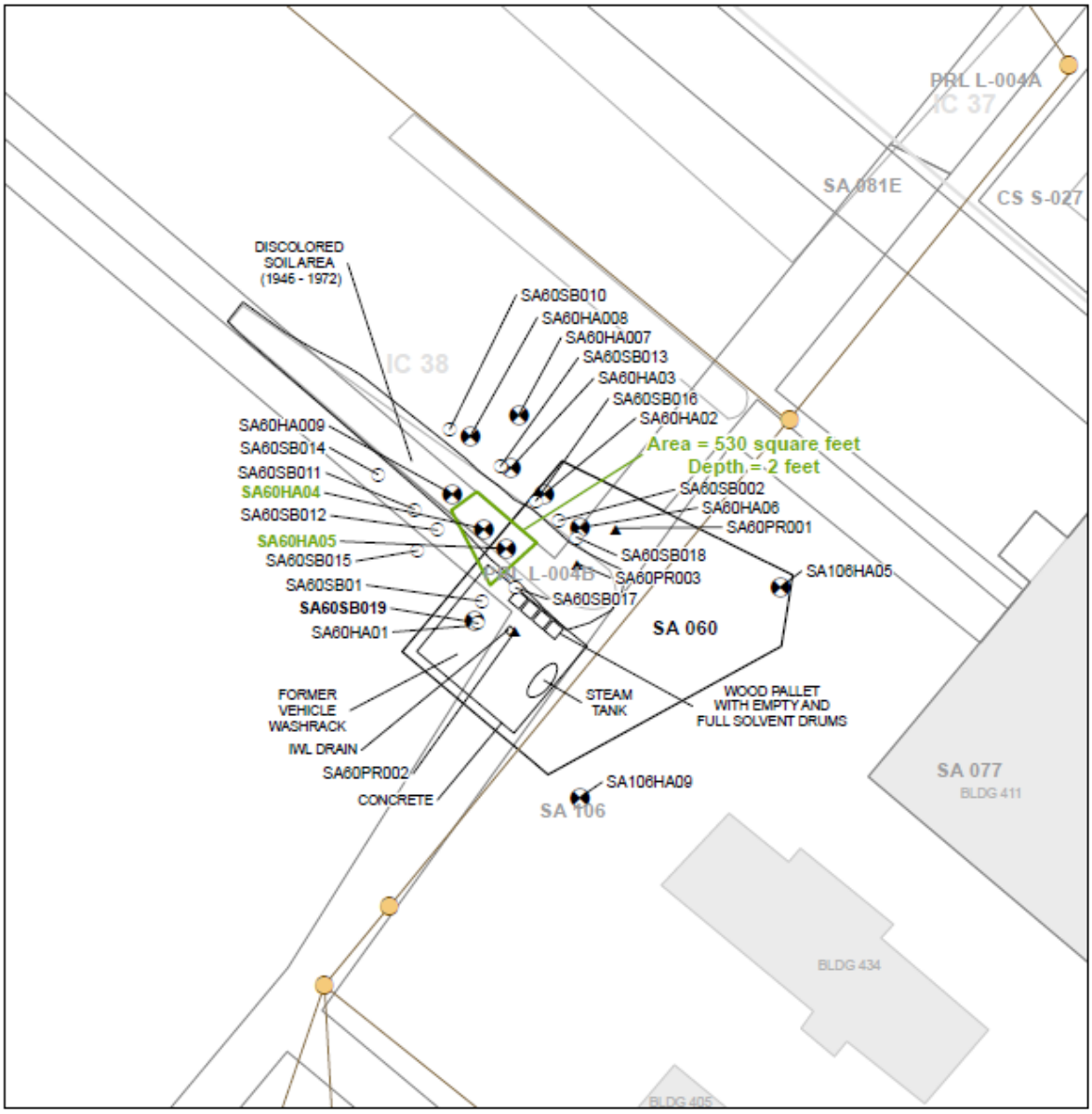
Contaminants Addressed: TPH-D in soil

Shallow Soil Gas: Risks are at the low end of the risk management range for unrestricted use and less than the risk management range for restricted use. The carcinogenic risks for the residential scenario range from 4×10^{-6} to 5×10^{-6}. Carcinogenic risks for the occupational worker scenario are less than 1×10^{-6}. Total non-carcinogenic HIs for both scenarios are less than 1. Although the risks for the residential scenario are within the risk management range, the site is considered sufficiently characterized. The eastern portion of SA 060 is also within the radius of influence of the IC 37 SVE system. No COCs have been identified.

Soil: Releases from the former washrack and associated piping, from drum storage, and from overflow when the IWL drain clogged have impacted the soil at SA 060. Soil risks are less than the risk management range for both restricted and unrestricted use; however, the HI for unrestricted use exceeds 1. The carcinogenic risks for the residential scenario and the occupational worker scenario are less than 1×10^{-6}. The non-carcinogenic HI for the residential scenario is 8, due to thallium, and for the occupational scenario is less than 1. TPH-D was detected above cleanup levels for protection of surface water and groundwater quality, and is considered a COC in soil.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at SA 060.

Rationale for Selected Remedies: The expected future use for site SA 060 is industrial. Alternative Non-VOC4a was selected to address TPH-D in soil that poses a threat to both surface water and groundwater quality. The industrial use target volume under Alternative Non-VOC4a is 40 cubic yards, and was selected to remove TPH-D in soil that exceed levels protective of surface water and groundwater quality. The unrestricted use target volume under Non-VOC4b is the same (40 cubic yards) because the excavation volume is based on the removal of soil for the protection of surface water and groundwater quality. Non-VOC4a was selected over Non-VOC4b because the future use is expected to be industrial. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

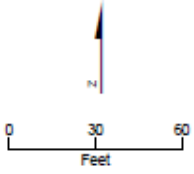


LEGEND

- SOIL GAS BORING
- HAND AUGER
- MID TO DEEP BORING (>15 FT BGS)
- MANHOLE
- INDUSTRIAL WASTE LINES
- ROADS
- TARGET VOLUME
- BUILDINGS
- SA 060
- IC BOUNDARY

Notes:
Small Volume Sites boring locations are shown in **bold**.

Borings in green have contaminant concentrations greater than PCGs.



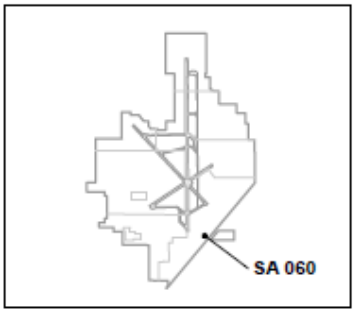


Figure D-67 SA 060 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

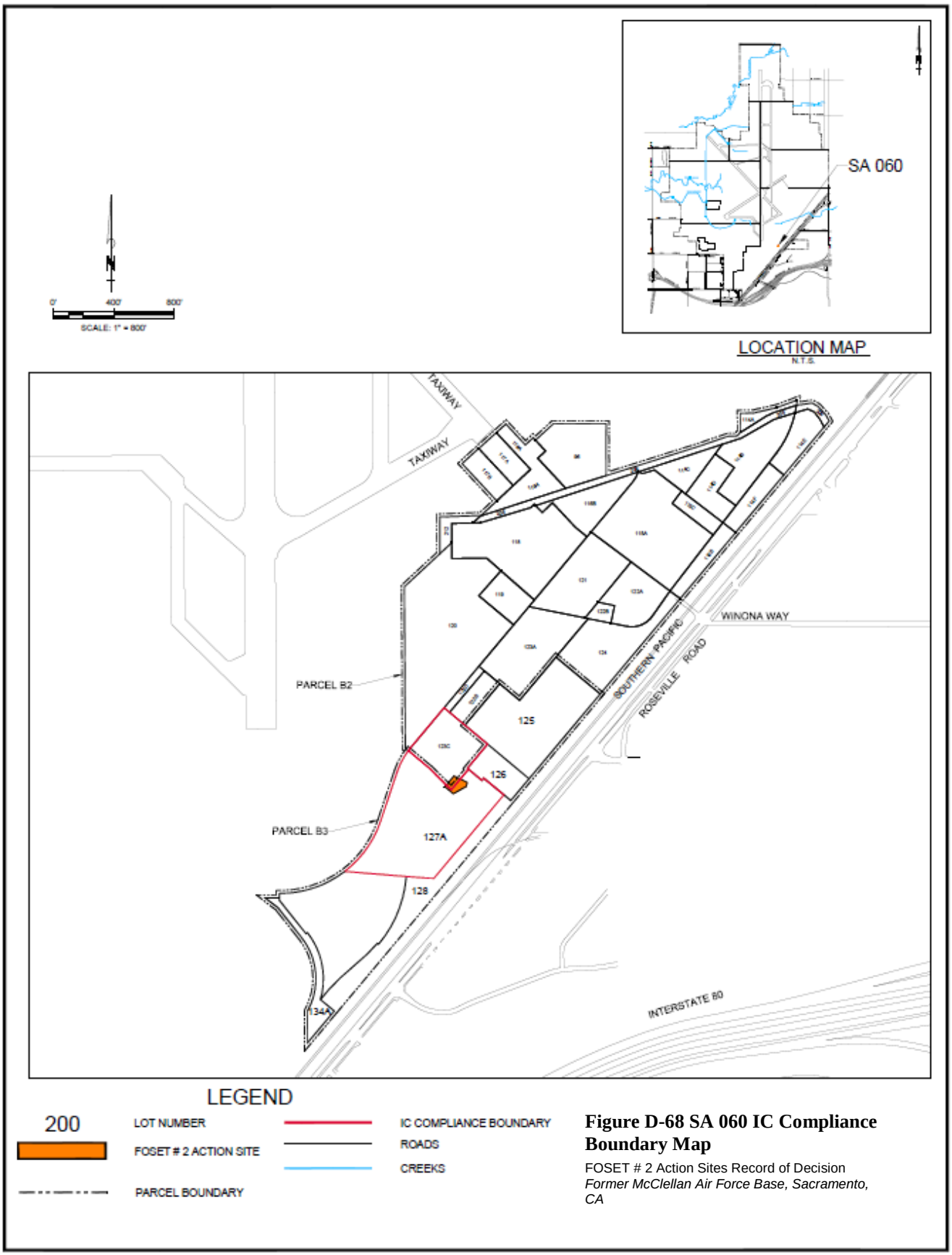


Figure D-68 SA 060 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

SA 063: This site consists of former Building 350, which was used as administrative offices and a machine and light electrical maintenance shop. A transformer was identified east of the former building location. A storm drain is located about 20 feet southeast of the former building location. The site is currently covered with gravel.

Selected Remedy: Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: PCBs in soil

Shallow Soil Gas: Risks are at the low end of the risk management range for unrestricted use and less than the risk management range for restricted use. Carcinogenic risks for the residential scenario range from 3×10^{-7} to 2×10^{-6}. Carcinogenic risks for the occupational worker scenario are less than 1×10^{-6}. The non-carcinogenic HIs for both scenarios are less than 1. SA 063 is also under the influence of the IC 30 and IC 31 SVE systems. No COCs have been identified.

Soil: Releases from former machine shop and electrical maintenance operations or leaks from the transformer have impacted the surface soil. Soil risks, driven by PCBs, are greater than the risk management range for unrestricted and restricted use. In addition, the HI values for both use scenarios are greater than 1. The carcinogenic risk for soil is 2×10^{-3} for the residential scenario and 2×10^{-4} for the occupational worker scenario. The non-carcinogenic risk is 211, due to Aroclor-1260 and arsenic, for the residential scenario and 12, due to Aroclor-1260, for the occupational scenario. Aroclor-1260 was detected at concentrations greater than levels for the protection of surface water and groundwater quality. The COC is Aroclor-1260.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at SA 063.

Rationale for Selected Remedies: The expected future use for site SA 063 is industrial. Alternative Non-VOC4a was selected to address Aroclor-1260 in soil that exceed the risk management range for industrial use and poses a threat to both surface water and groundwater quality. The industrial use target volume under Alternative Non-VOC4a is 400 cubic yards, and was selected to remove Aroclor-1260 in soil that exceeds industrial cleanup levels and levels protective of surface water and groundwater quality. The unrestricted use target volume of 1,860 cubic yards under Non-VOC4b was not selected because it does not include all of the locations where Aroclor-1260 concentrations exceed levels protective of surface water quality. Because PCBs that exceeded the cleanup level for surface water quality protection will remain in place, ECs will be required where excavation is not planned. Before completion of the RD, additional surface sampling must be completed to delineate the extent of contamination due to several sample locations that exceeded surface water quality requirements. Excavation of locations that exceed levels protective of surface water quality, maintaining surface cover, or sediment traps and monitoring is required. There is also some uncertainty in the lateral extent of contamination to the west and east, as well as uncertainty in the vertical extent. Due to the need for ECs, the uncertainties in extent, and the expected future use for SA 063, Non-VOC4a was selected over Non-VOC4b. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the soil risks exceed the risk management range for unrestricted use and the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

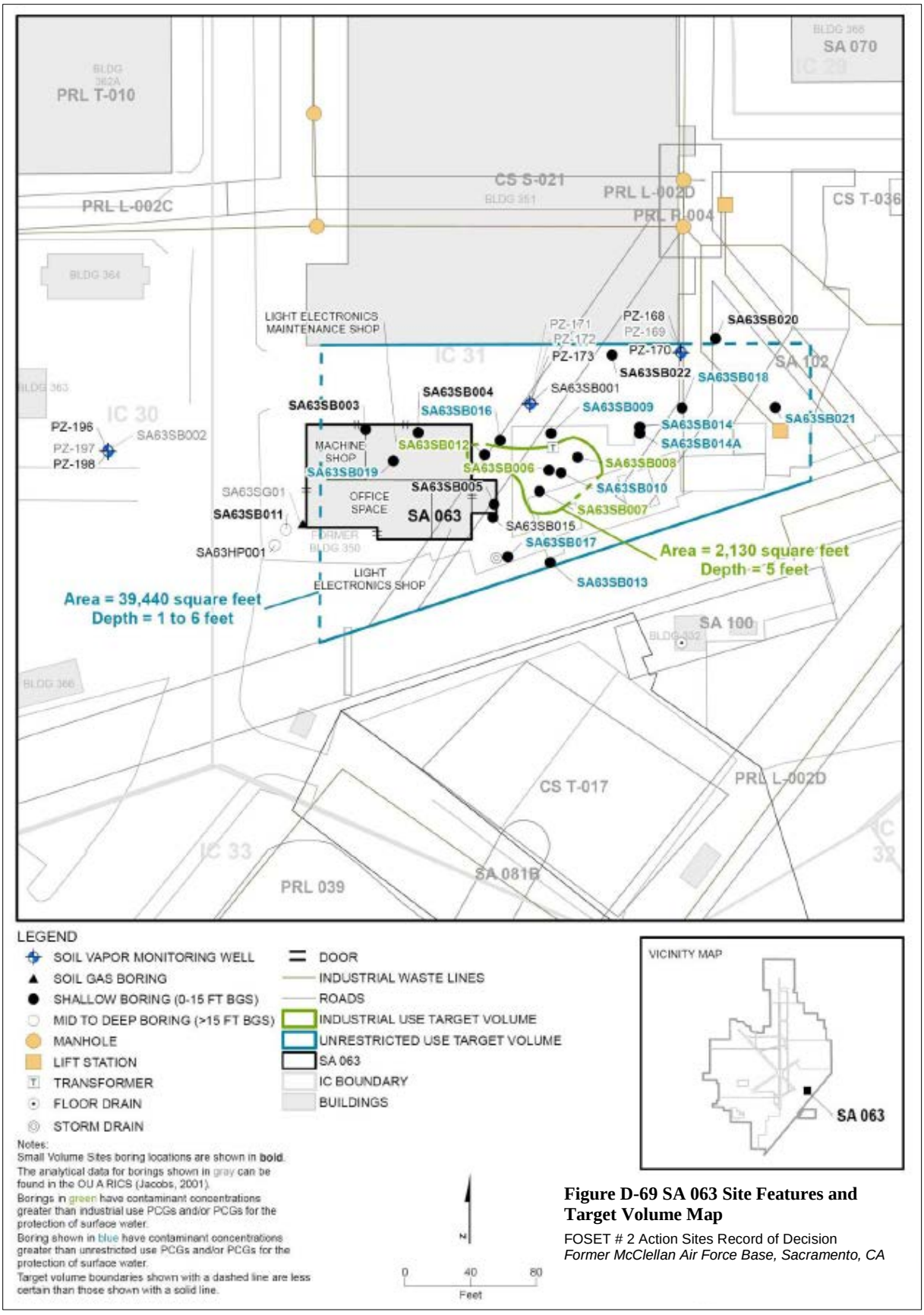


Figure D-69 SA 063 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

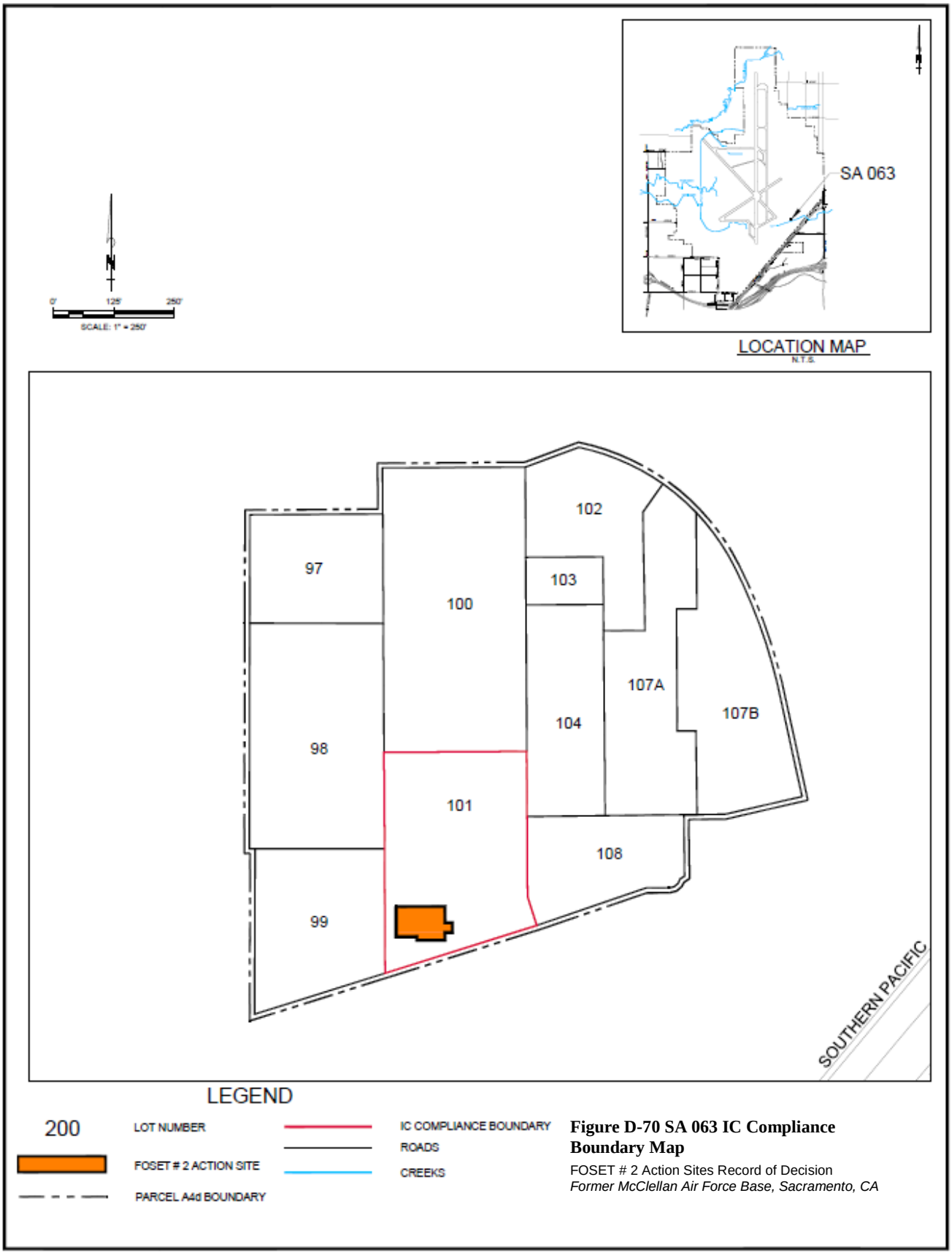


Figure D-70 SA 063 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

SA 066: This site is a former motor pool site that consisted of Building 357. No drains, sumps, or other motor pool features were identified inside the building. The building is completely surrounded by asphalt and concrete.

Selected Remedy: Alternatives VOC3 (ICs/ECs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; TPH-D in soil

Shallow Soil Gas: Risks are greater than the risk management range for unrestricted and restricted use. In addition, the HI values for both use scenarios exceed 1. The cumulative sample-by-sample carcinogenic risks for the residential scenario range from 7×10^{-7} to 2×10^{-2} and total non-carcinogenic HIs range from less than 1 to 77. Carcinogenic risks for the occupational worker scenario range from 4×10^{-8} to 1×10^{-3} and non-carcinogenic HIs range from less than 1 to 5. The COCs are benzene, carbon tetrachloride, chloroform, 1,4-DCB, ethylbenzene, naphthalene, PCE, TCE, 1,2,4-TMB, and 1,3,5-TMB. SA 066 is within the radius of influence of the IC 29 SVE system.

Soil: Releases resulting from activities conducted during operation of the motor pool have impacted the site soil. Soil risks are less than the risk management range for unrestricted and restricted use. The carcinogenic risk and non-carcinogenic HI for the residential and occupational worker scenarios are significantly less than 1×10^{-6} and 1, respectively. TPH-D exceeded cleanup levels for protection of groundwater quality and is considered a COC in soil.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 1×10^{-3} and may be higher when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for site SA 066 is industrial. Alternatives VOC3 and Non-VOC4a were selected to address VOCs in SSG that exceed the risk management range for industrial use and to address TPH-D in soil that poses a threat to groundwater quality. VOC3 was selected over VOC2 because risk exceeds the risk management range, not only for unrestricted use, but also for industrial use, and restricted use alone will not be sufficient to protect workers. The ICs and ECs established by Alternative VOC3 will restrict the use of the site and require the installation of engineered controls in any future buildings or during significant remodeling of existing buildings to mitigate the potential for VOCs in SSG from migrating into buildings and impacting occupants via the vapor inhalation pathway. The parcels and lots affected by the IC compliance buffer for Alternative VOC3 are Parcel A4d, Lots 102, 107A and 107B; Parcel L4, Lot 105; and Parcel A4c, Lot 106.

The industrial use target volume under Alternative Non-VOC4a is 30 cubic yards, and was selected to remove TPH-D in soil that exceeds levels protective of groundwater quality. The unrestricted use target volume under Non-VOC4b is the same (30 cubic yards) because the excavation volume is based on the removal of soil for the protection of groundwater quality. Non-VOC4a was selected over Non-VOC4b because the lateral extent of TPH-D to the southwest of SA66SB016 is uncertain, there will be ICs associated with VOC3, and the future use for SA 066 is industrial. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

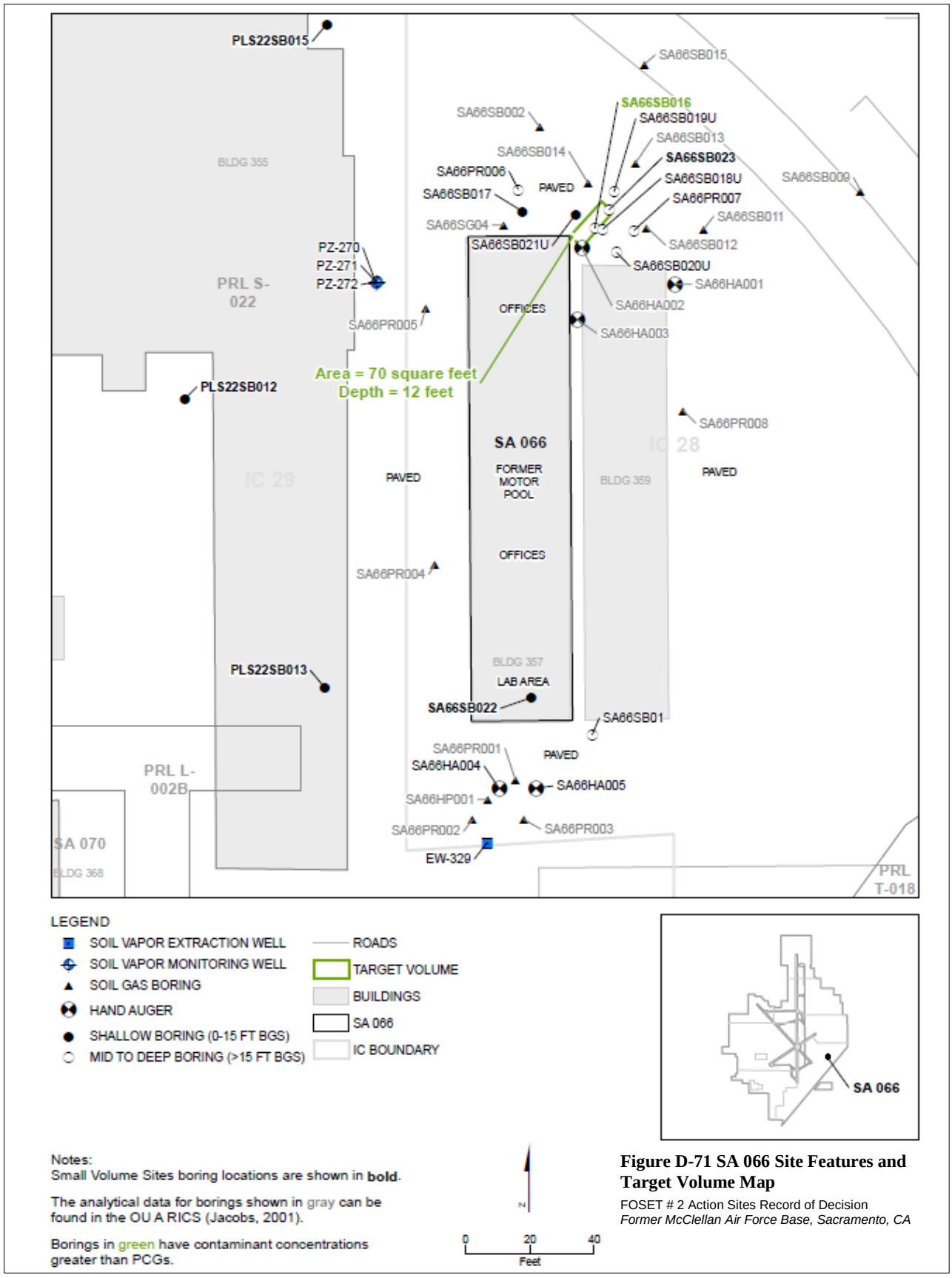


Figure D-71 SA 066 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

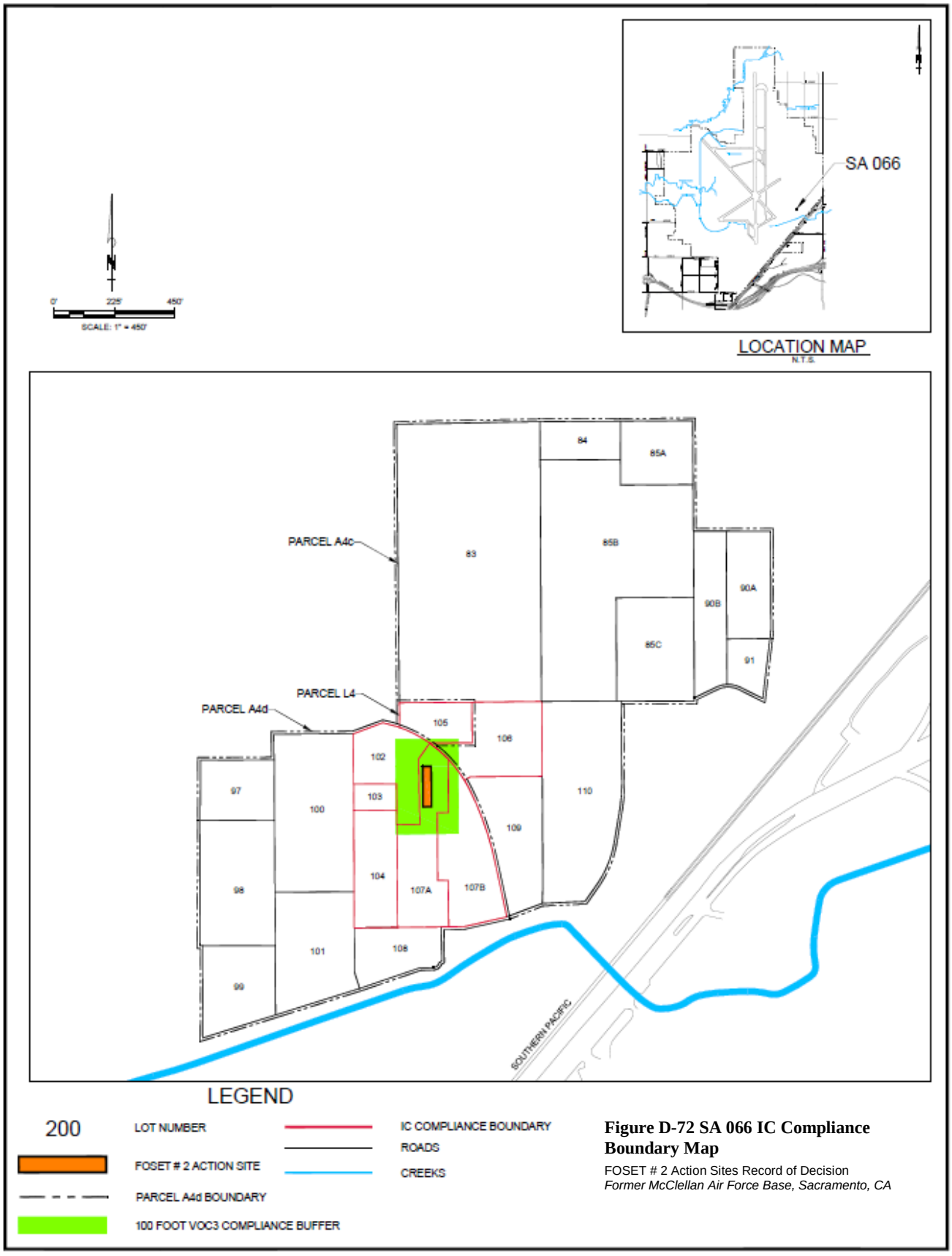


Figure D-72 SA 066 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

SA 080: This site consists of a grassy field where drummed chemicals were previously stored. In 1987, a contractor reported discharging hazardous rinse water and other wastes to the ground surface at SA 080. By 1987, all drums were removed from the site, and contaminated surface soil was removed and backfilled with clean soil. The soil removal is not well documented. No confirmation samples were taken and the quantity of soil removed was not reported.

Selected Remedy: Alternatives VOC3 (ICs/ECs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; dioxins/furans and lead in soil

Shallow Soil Gas: Risks are greater than the risk management range for unrestricted use and at the high end of the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. For the residential scenario, the carcinogenic risk ranges between 2×10^{-7} and 2×10^{-3}, and the non-carcinogenic HI ranges from less than 1 to 9. For the occupational worker scenario, the carcinogenic risk ranges between 1×10^{-8} and 9×10^{-5}, and the non-carcinogenic HIs are less than 1. The COCs are 1,2,4-TMB; 1,3,5-TMB; 1,2-DCA; benzene; chloroform; cis-1,2-DCE; ethylbenzene; naphthalene; PCE; TCE; and vinyl chloride. SA 080 is under the influence of the IC 35 SVE system.

Soil: Leaks in fuel distribution line and associated supply lines and releases of chemicals from surface spills at hazardous materials storage area have impacted the SA 080 soil. Soil risks, driven by dioxins/furans, are greater than the risk management range for unrestricted use and within the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. Lead was detected at concentrations above the unrestricted screening level, but below the restricted screening level. The carcinogenic risk is 5×10^{-4} for the residential scenario and 4×10^{-5} for the occupational worker scenario. The non-carcinogenic HI for the residential scenario is 5 due to arsenic, dioxins/furans, and 2-methylnaphthalene, and the occupational worker scenario is less than 1. Lead and dioxin/furan concentrations exceed levels for the protection of surface water quality. The COCs are dioxins/furans and lead.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 1.3×10^{-4} and may be higher when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use of SA 080 is industrial. Alternatives VOC3 and Non-VOC4a were selected to address VOCs in SSG that exceed the risk management range for unrestricted use and to address lead and dioxins/furans in soil that pose a threat to surface water quality. The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is higher than the risk management range. Also, only a single SSG sample was collected from this site and restricted use alone may not be sufficient to protect workers. For these reasons, VOC3 was selected over VOC2. The ICs and ECs established by Alternative VOC3 will restrict the use of the site and require the installation of engineered controls in any future buildings or during significant remodeling of existing buildings to mitigate the potential for VOCs in SSG from migrating into buildings and impacting occupants via the vapor inhalation pathway.

The industrial use target volume (combined with CS T-057 and SA 107) under Alternative Non-VOC4a is 110 cubic yards, and was selected to remove lead and dioxins/furans in soil that exceed levels protective of surface water quality. The unrestricted use target volume of 110 cubic yards under Non-VOC4b was not selected. Based on sampling results, and to protect surface water, ECs are needed to maintain surface cover in the vicinity of sample CST57SB021. Due to the need for ECs, and because the future use is expected to be industrial, Non-VOC4a was selected over Non-VOC4b. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because soil risks exceed the risk management range for unrestricted use and the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling

must be done, the existing surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

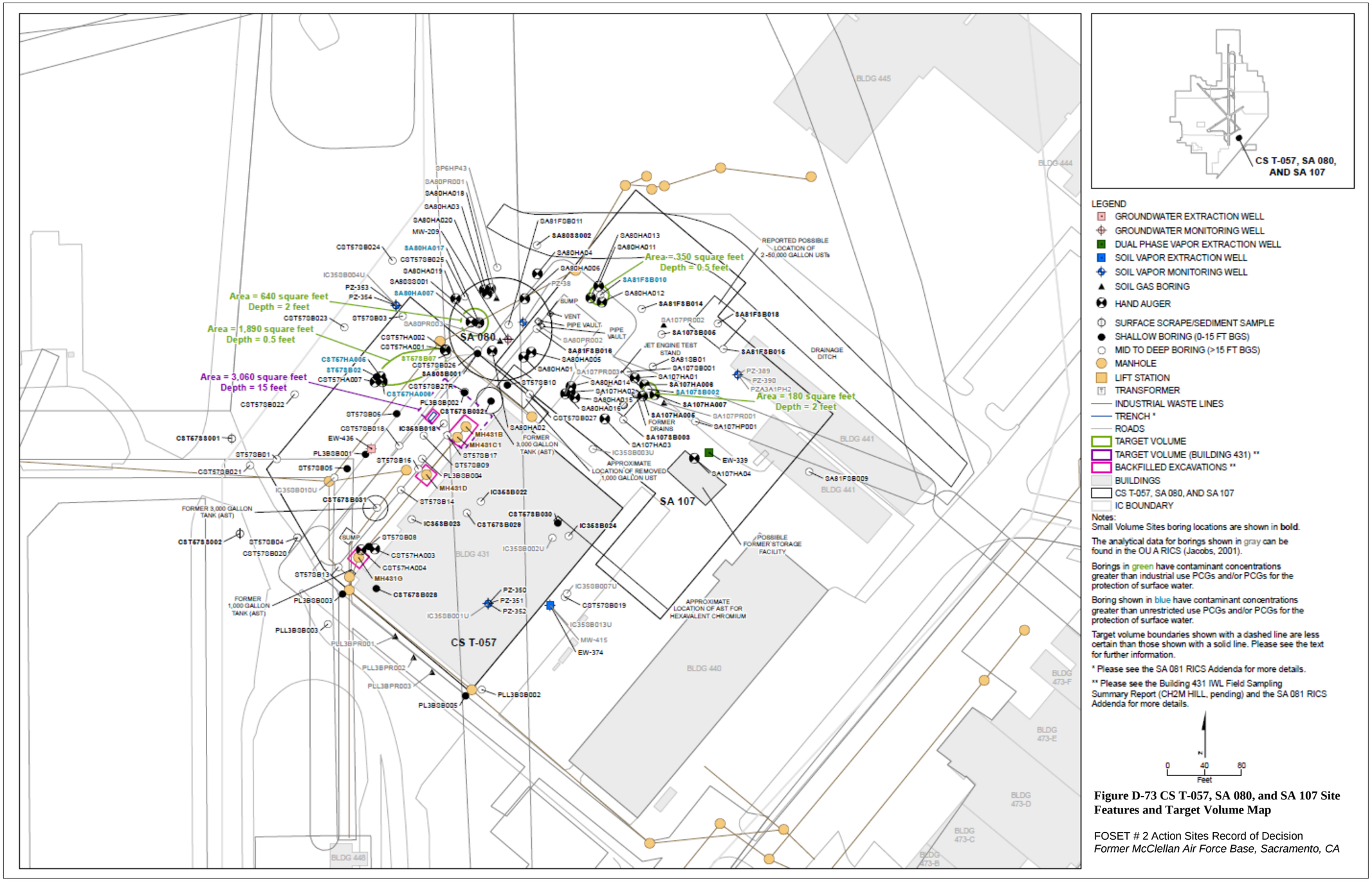


Figure D-73 CS T-057, SA 080, and SA 107 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

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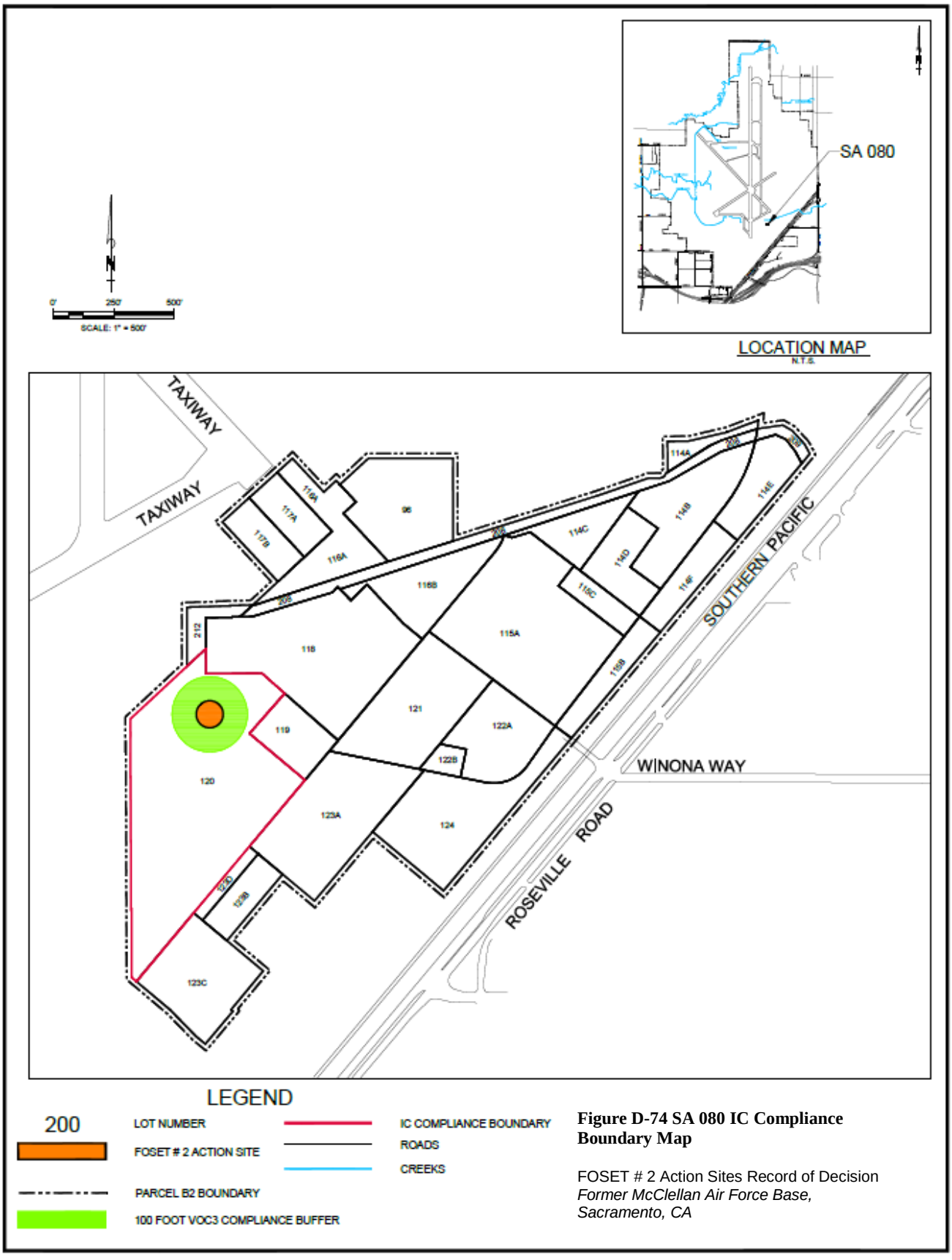

Figure D-74 SA 080 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

SA 096: This site is the former location of Building T-410 (reclamation building) and a hazardous materials staging area for the motor pool. In 1968, the foundation of Building T-410 was covered by asphalt, after which the area was used as a solid hazardous waste staging area. Most of SA 096 is covered by asphalt and concrete. Drums in this area were observed to contain antifreeze, motor oil, gear lube oil, and heavy duty grease. Two 500-gallon USTs or sumps were located adjacent to the southwestern boundary of SA 096; the removal date and contents of these suspected USTs or sumps are unknown. A geophysical survey conducted in January 2001 indicated there were no tanks or sumps under the area near Building T-410.

Selected Remedy: Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: TPH-D and TPH-G in soil

Shallow Soil Gas: Risks are at the low end of the risk management range for unrestricted use and less than the risk management range for restricted use. Carcinogenic risks for the residential scenario range from 2×10^{-6} to 5×10^{-6}, which is within the risk management range, and total non-carcinogenic HIs are less than 1. Carcinogenic risks for the occupational worker scenario range from 1×10^{-7} to 3×10^{-7} and non-carcinogenic HIs are less than 1. Although the risks for the residential scenario are within the risk management range, VOCs in soil gas were not identified as COCs at SA 096 because VOCs were detected at low concentrations in a small number of shallow soil gas samples. The lateral extent has been defined to less than industrial use screening levels No COCs have been identified.

Soil: Leaks from the two suspected 500-gallon USTs/sumps and the concrete IWL sump may have impacted the subsurface soil. Soil risks are within the risk management range for unrestricted and restricted use. The carcinogenic risk for the residential scenario is 4×10^{-5} and for the occupational scenario is 3×10^{-6}. The HI values are less than 1 for both use scenarios. TPH-D and TPH-G were detected above the cleanup levels for protection of groundwater quality, and are considered COCs.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at SA 096.

Rationale for Selected Remedies: The expected future use of SA 096 is industrial. Alternative Non-VOC4a was selected to address TPH-D and TPH-G in soil that pose a threat to groundwater quality. The industrial use target volume under Alternative Non-VOC4a is 290 cubic yards, and was selected to remove TPH-D and TPH-G in soil that exceed levels protective of groundwater quality. The unrestricted use target volume under Non-VOC4b is the same (290 cubic yards) because the excavation volume is based on the removal of soil for the protection of groundwater quality. Non-VOC4a was selected over Non-VOC4b because the future use for SA 096 is industrial and due to uncertainty (there were no surface samples collected at SA 096). ECs (sediment trap and monitoring) are required to protect surface water quality. The ICs require that surface sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

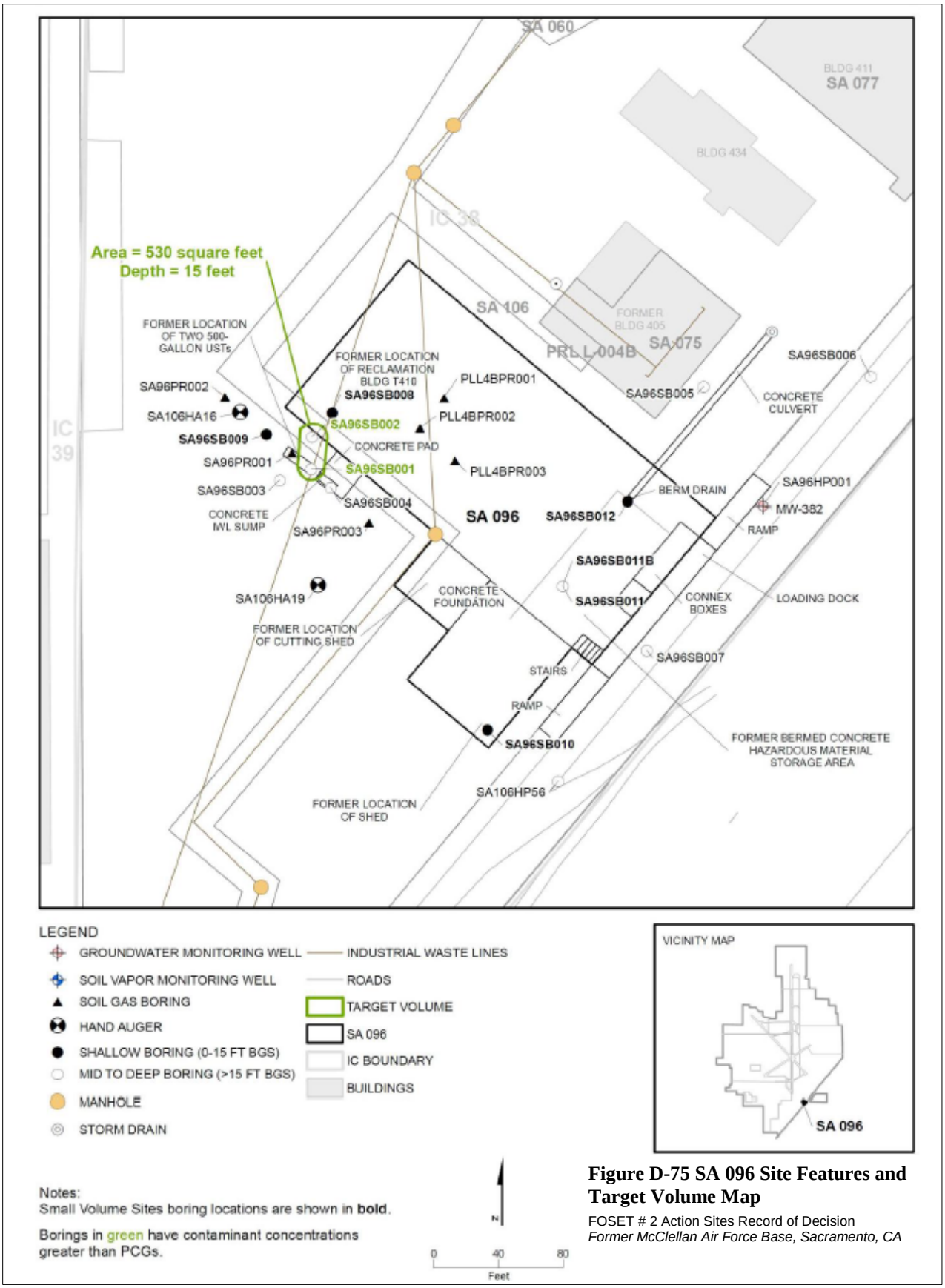

Figure D-75 SA 096 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

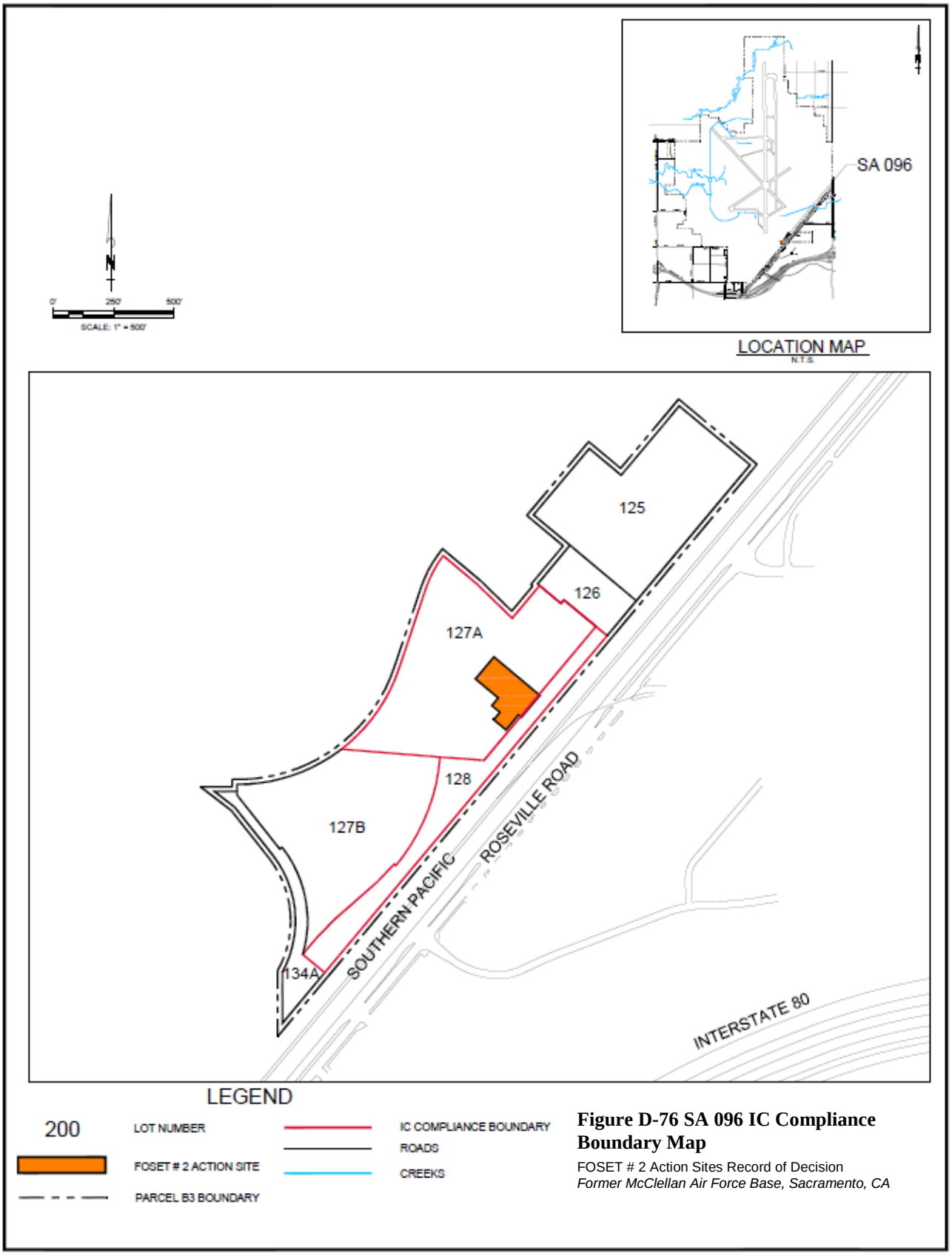

Figure D-76 SA 096 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

SA 097: This site consists of a bermed, concrete-covered hazardous waste staging area and the demolished Building 426 (a former steam-cleaning washrack). The building had several cracks in the concrete floor that had been sealed with tar and gray sealant. An OWS was also located beneath the northwest corner of Building 426. Hazardous wastes handled at the SA 097 hazardous waste staging area include solvents, empty lubricant aerosol cans, paints, caustic paint sludge, spent paint cans, and contaminated rags. The washrack at Building 426 was removed in 1988. The OWS was cleaned, and the floor drain was capped. The site is currently gravel-covered. A surface spill area was adjacent to the northeast corner of the hazardous waste staging area. The spill area received runoff from the staging area via a valved pipeline and catch basin within the staging area. The catch basin in the northeast corner of SA 097 received runoff and overflow from the hazardous waste staging area and the former washrack. Wastewater that reportedly contained fuel, oil, and PCBs overflowed from the former washrack into the surface spill area. A cut pipeline, formerly connected to the IWL, is located on the north side of the surface spill area.

Selected Remedy: Alternatives VOC3 (ICs/ECs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)
Contaminants Addressed: VOCs in SSG; metals, PCBs, and TPH-D in soil

Shallow Soil Gas: Risks are greater than the risk management range for unrestricted use and are at the upper end of the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. The cumulative sample-by-sample carcinogenic risks in soil gas for the residential scenario range from 4×10^{-4} to 2×10^{-3}, and the total non-carcinogenic HIs range from 2 to 8. The estimated cumulative sample-by-sample carcinogenic risks in soil gas for the occupational worker scenario range from 3×10^{-5} to 1×10^{-4}, and the non-carcinogenic HIs are less than 1. SA 097 is within the estimated radius of influence of a new SVE well to be installed as part of the IC 34 SVE system. The COCs are cis-1,2-DCE, PCE, and TCE. SA 097 is under the influence of the IC 34 and IC 37 SVE systems.

Soil: Releases from cracks in the floor of the bermed, concrete-covered hazardous material staging area have impacted surface soil, and releases from the former washrack have impacted the subsurface soil. Soil risks are within the risk management range for both unrestricted use and restricted use. In addition, the HI for unrestricted use is greater than 1. Lead was detected above the unrestricted use cleanup level, but is less than the restricted use cleanup level. TPH-D was detected above cleanup levels for protection of groundwater quality. The carcinogenic risk is 5×10^{-5} for the residential scenario and 4×10^{-6} for the occupational worker scenario. The non-carcinogenic HI for the residential scenario is 4 due to 4-chloroaniline, arsenic, cadmium, and Aroclor-1260, and the HI for the occupational worker scenario is less than 1. Cadmium, lead, Aroclor-1254, and Aroclor-1260 were detected at concentrations exceeding levels for protection of surface water quality. TPH-D was detected at concentrations exceeding levels for both protection of surface water and groundwater quality. The COCs are cadmium, lead, 4-chloroaniline, Aroclor-1254, Aroclor-1260, and TPH-D.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 1.04×10^{-4} and may be higher when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for site SA 097 is industrial. Alternatives VOC3 and Non-VOC4a were selected to address VOCs in SSG that exceed the risk management range for unrestricted use and cadmium, lead, PCBs, and TPH-D in soil that poses a threat to surface water and groundwater quality. The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is greater than the risk management range. Due to this uncertainty, VOC3 was selected over VOC2 because restricted use alone may not be sufficient to protect workers. The ICs and ECs established by Alternative VOC3 will restrict the use of the site and require the installation of engineered controls in any future buildings or during significant remodeling of existing buildings to

mitigate the potential for VOCs in SSG from migrating into buildings and impacting occupants via the vapor inhalation pathway. The parcel and lot affected by the IC compliance buffer for Alternative VOC3 is Parcel B2, Lot 124.

The industrial use target volume under Alternative Non-VOC4a is 40 cubic yards, and was selected to remove cadmium, lead, PCBs, and TPH-D in soil that exceed levels protective of surface water and groundwater quality. The unrestricted use target volume under Non-VOC4b is the same (40 cubic yards) because the excavation volume is based on the removal of soil for the protection of surface water and groundwater quality. PCBs exceeded the cleanup level for surface water quality protection and will require ECs to maintain surface cover where excavation is not planned. Due to the need for ECs and expected future land use for SA 097, Non-VOC4a was selected over Non-VOC4b. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded. The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

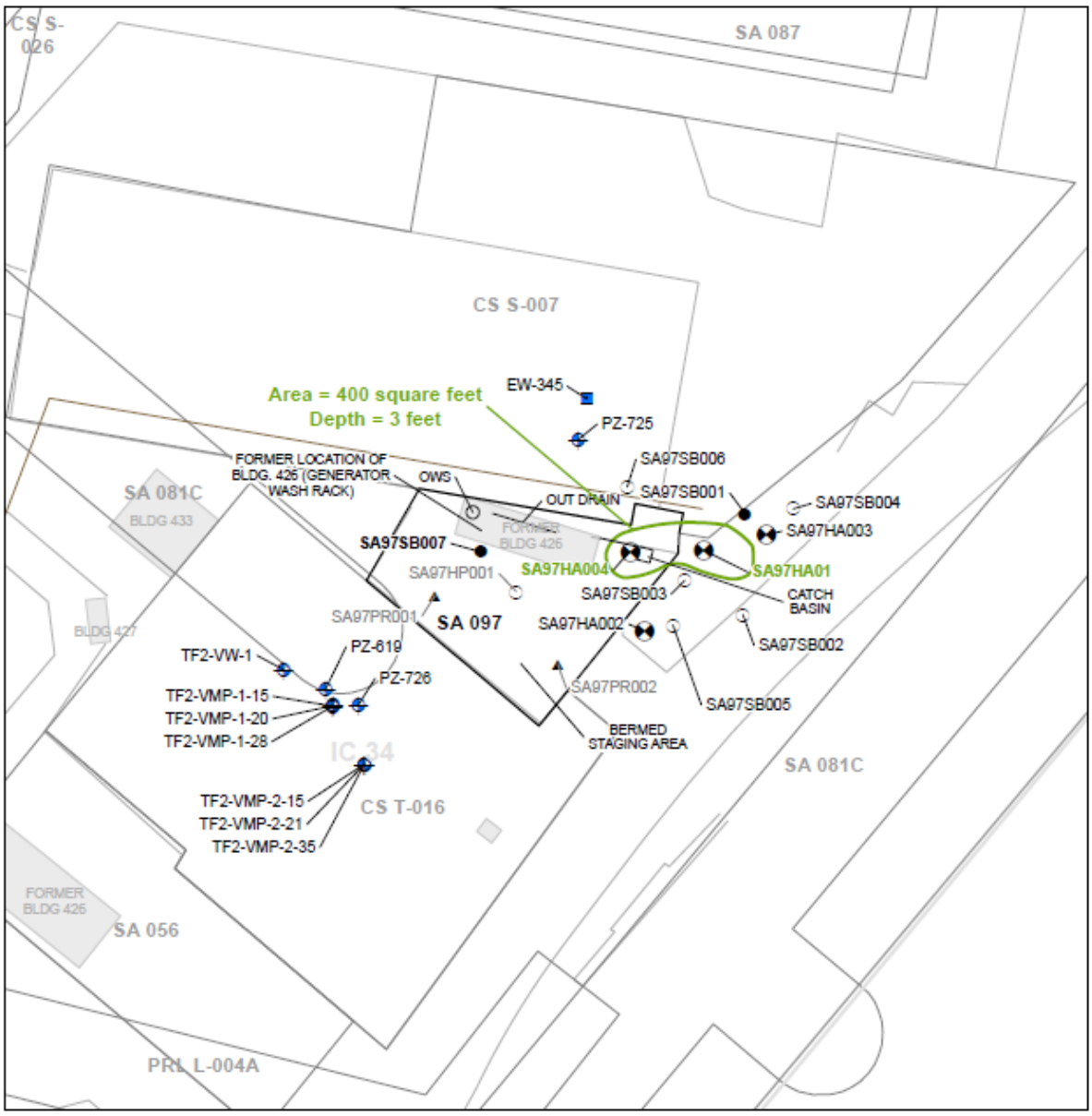

Figure D-77 SA 097 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

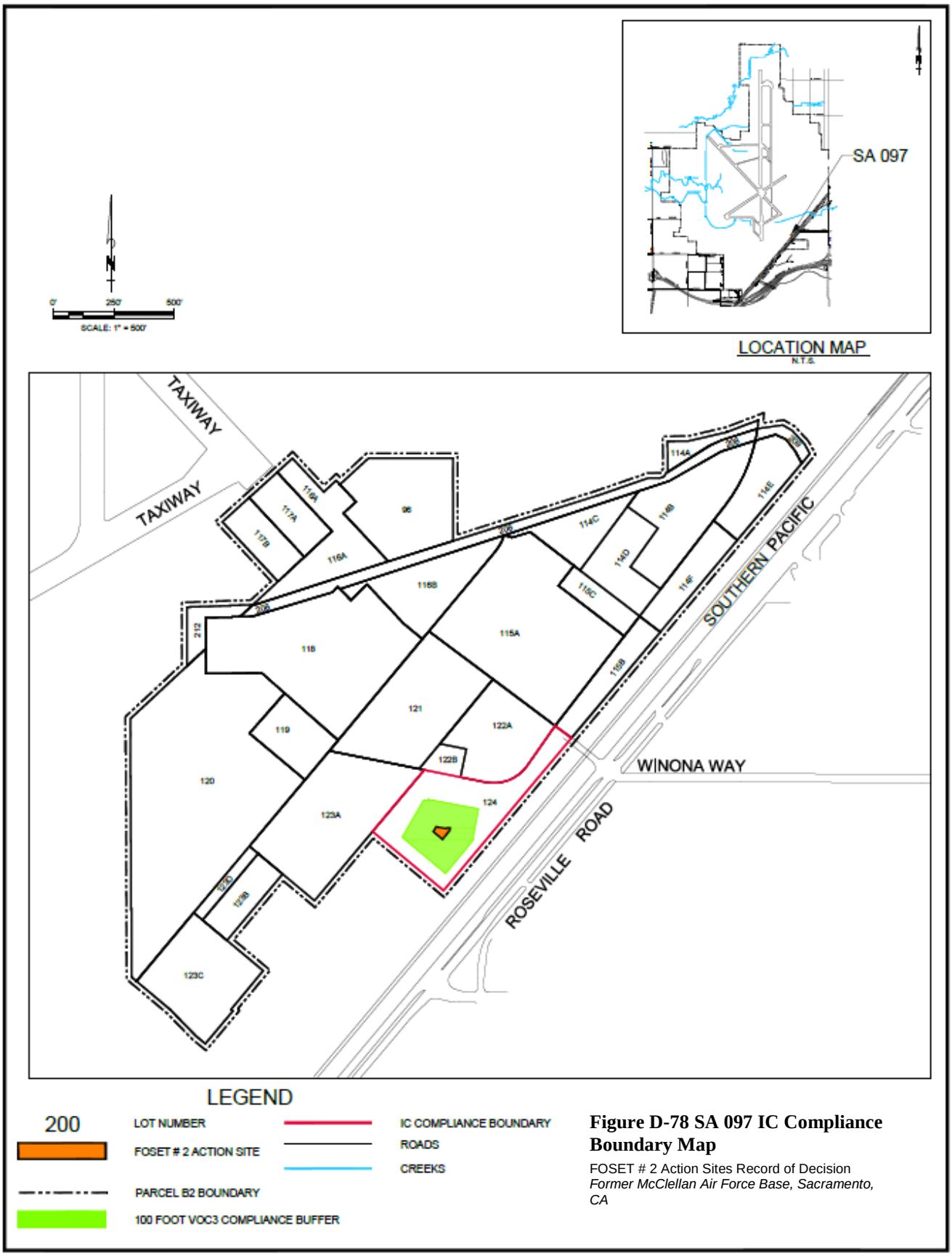

Figure D-78 SA 097 IC Compliance Boundary Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

SA 100: This site consists of Building 332 (paper shredder), a 500-gallon diesel UST, an incinerator, a diesel AST, and two ASTs with unknown contents. The paper shredder at Building 332 was powered by a diesel engine that was also contained within Building 332. In addition, there is a small floor drain in the southwestern corner of the building that discharges to Magpie Creek through an underground line. The 500-gallon UST was located along the eastern wall and southeastern corner of Building 332 and stored diesel fuel that powered the shredder and hopper. The UST was removed in 1992, but has not been granted closure status. The diesel AST was located on the southern wall of Building 322. It is unknown when this AST was operated or when it was removed. The other two ASTs were located east of the incinerator. It is unknown when these ASTs operated, what they stored, or when they were removed, but they most likely provided fuel to the incinerator or the diesel-powered paper shredder. The incinerator is located in the eastern portion of the site and was reportedly used for the destruction of classified documents. An industrial waste sump is located just north of the incinerator. The sump is a two-chambered unit that received waste water from the incinerator. Effluent from the sump was pumped via pipeline across Magpie Creek to an IWL lateral (part of PRL L-002).

Selected Remedy: Alternatives VOC2 (ICs), Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; dioxins/furans and lead in soil

Shallow Soil Gas: Risks are at the high end of the risk management range for unrestricted use and are within the risk management range for restricted use. Based on the 15-foot soil gas sample from SA100SB015, the carcinogenic risk for the residential scenario is 1×10^{-4}, and the non-carcinogenic HI is less than 1. For the occupational worker scenario, the carcinogenic risk is 8×10^{-6}, and the HI is less than 1. The primary risk drivers for carcinogenic risk for the residential scenario are carbon tetrachloride and chloroform, which were detected at concentrations greater than industrial use screening levels. The COCs are benzene, chloroform, and carbon tetrachloride. SA 100 is under the influence of the IC 31 SVE system.

Soil: Releases from the incinerator and ASTs have impacted the surface soil, and releases from the UST and industrial waste sump have impacted the subsurface soil. Soil risks, driven by dioxins/furans, are greater than the risk management range for unrestricted use and within the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. The carcinogenic risks for the residential and occupational worker scenarios are 2×10^{-4} and 2×10^{-5}, respectively. The non-carcinogenic HIs for the residential and occupational worker scenarios are 2 (due to arsenic) and less than 1, respectively. Lead and dioxins/furans exceeded surface water protection cleanup levels, and are the COCs identified at SA 100.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 2.8×10^{-5} and may exceed 10^{-4} when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use for site SA 100 is industrial. Alternatives VOC2 and Non-VOC4a were selected to address VOCs in SSG and to address lead and dioxin/furans in soil that pose a threat to surface water quality. Although SSG risks are at the upper end of the risk management range, soil gas samples were only collected from one location at SA 100, which is insufficient to characterize SSG. VOC2 was selected due to this uncertainty. The ICs established by Alternative VOC2 will restrict the use of the site in order to prohibit potential exposures to VOCs in SSG.

The industrial use target volume under Alternative Non-VOC4a is 20 cubic yards, and was selected to remove lead and dioxin/furans in soil that exceed levels protective of surface water quality. The unrestricted use target volume under Non-VOC4b is the same (20 cubic yards) because the excavation volume is based on the removal of soil for the protection of surface water quality. Non-VOC4a was selected over Non-VOC4b because the future use for SA 100 is industrial and there will be ICs associated

with VOC2. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because the soil risks exceed the risk management range for unrestricted use and the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, a surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternative results in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

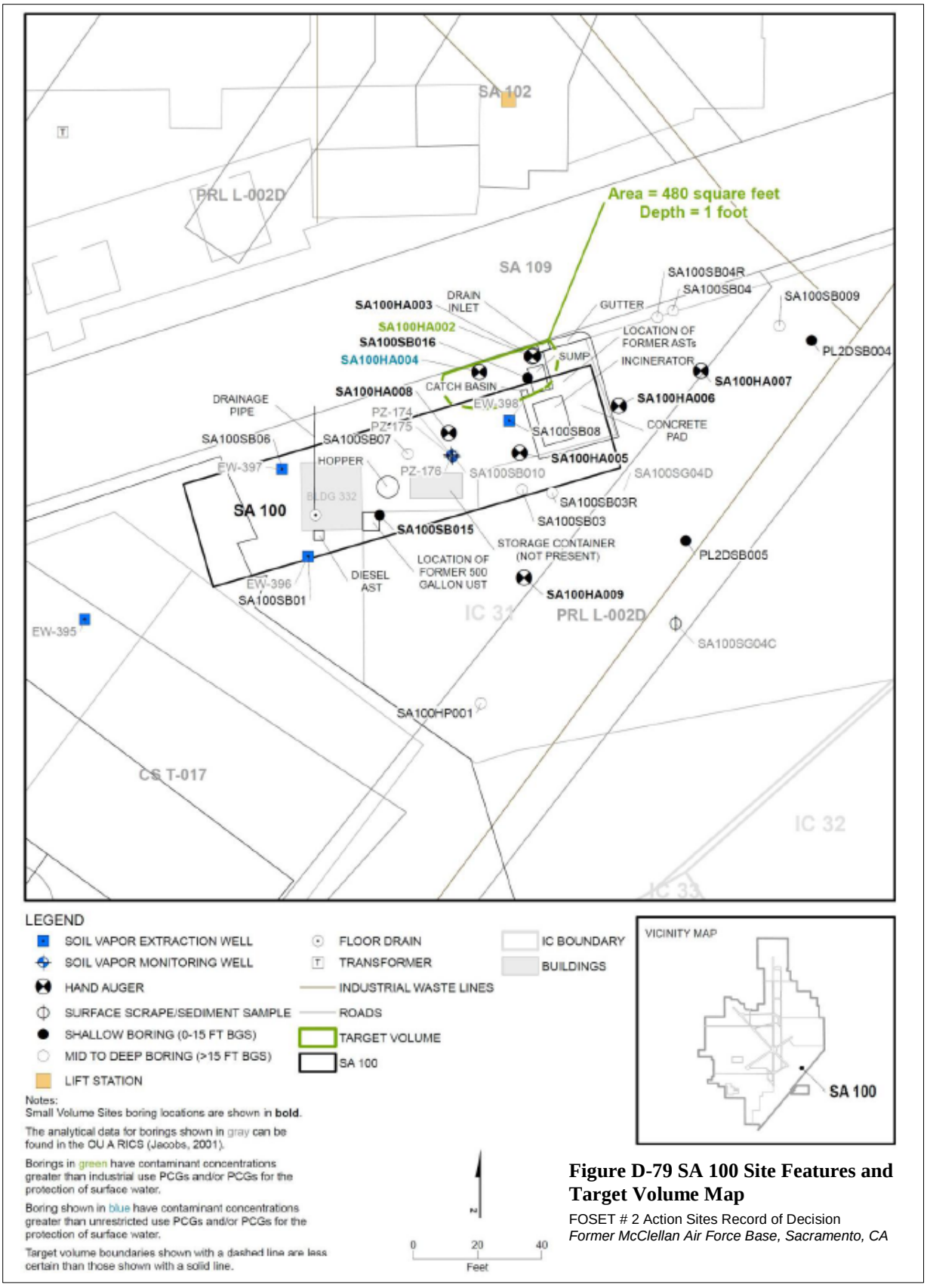

Figure D-79 SA 100 Site Features and Target Volume Map

FOSET # 2 Action Sites Record of Decision
Former McClellan Air Force Base, Sacramento, CA

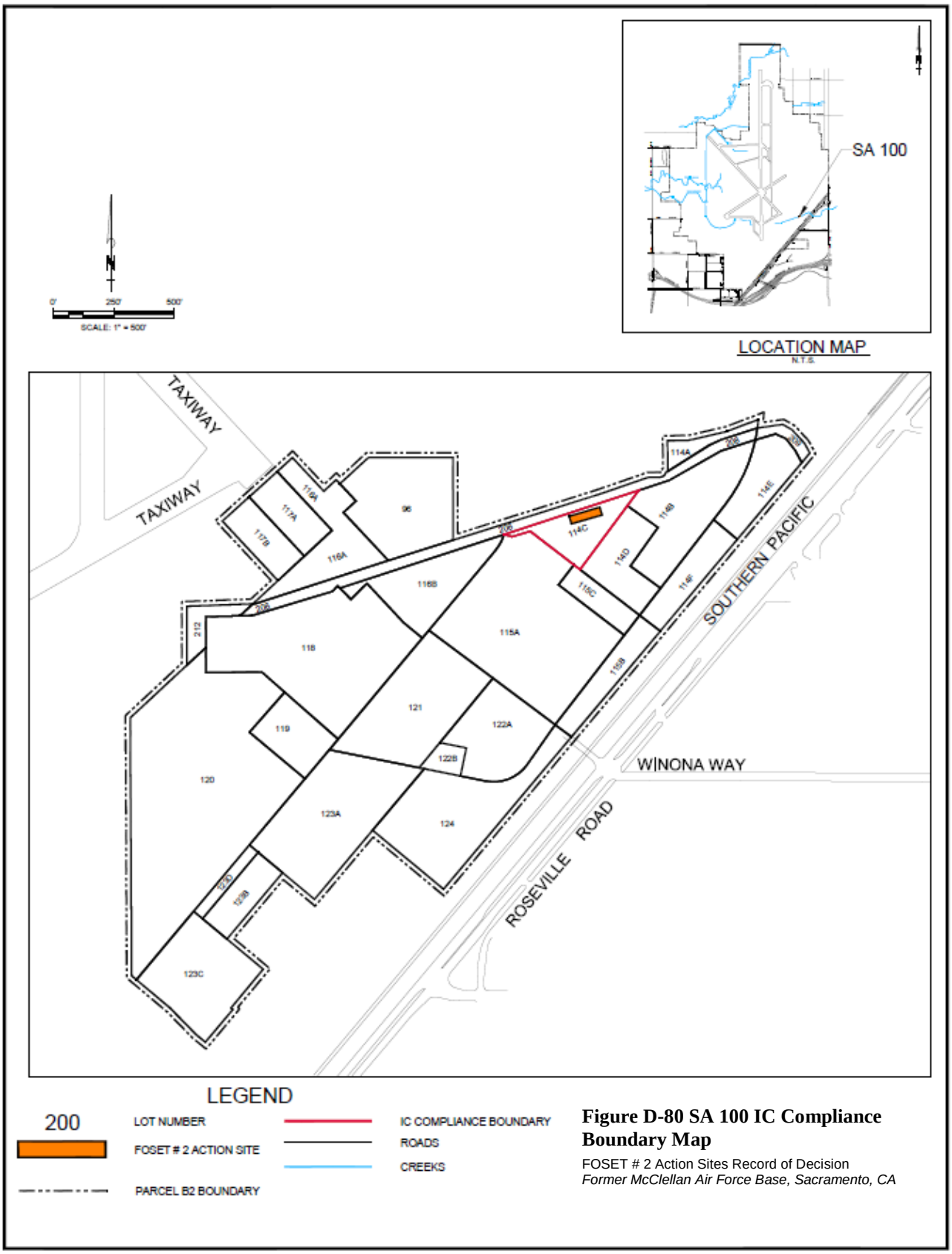

Figure D-80 SA 100 IC Compliance Boundary Map

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SA 107: This site comprises 1.7 acres, and is the former location of two jet engine test stands. Operations at SA 107 routinely used fuels, oils, and solvents. An unlined drainage ditch is located in the northern portion of the site and surface runoff at SA 107 runs north into the unlined drainage ditch. The test stands were located on a 40-by-36-foot concrete slab. Two 12-inch-square grated drains are located on the southeastern edge of the test stand and were probably used to drain spills at the site. The drains are currently filled with soil and are inoperable. Interviews with former base personnel indicate that the drains were connected to a UST near the site. A portion of the base IWL is on the northwestern side of SA 107, about 75 feet from the test stands. It is also possible that the drains on the test stand are plumbed into the IWL. There is a second concrete pad located on the southeastern side of the site; what this pad was used for is not known. A segment of the underground base fuel supply line (SA 081F) crosses the site from east-southeast to west-northwest and supplied two portable jet fuel storage tanks used to fuel engines formerly tested at the site. CS T-057 documents (dated 1991) from the UST files for Building 431 indicate that two 50,000-gallon USTs were located in the eastern portion of SA 107. There is no record of these tanks being removed, and it is possible they are still located at SA 107.

Selected Remedy: Alternatives VOC3 (ICs/ECs) and Non-VOC4a (Excavation and Disposal–Restricted Land Use)

Contaminants Addressed: VOCs in SSG; dioxins/furans and lead in soil

Shallow Soil Gas: Risks are greater than the risk management range for unrestricted use and at the high end of the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. For the residential scenario, the carcinogenic risk ranges between 2×10^{-7} and 2×10^{-3}, and the non-carcinogenic HI ranges from less than 1 to 9. For the occupational worker scenario, the carcinogenic risk ranges between 1×10^{-8} and 9×10^{-5}, and the non-carcinogenic HIs are less than 1. The COCs are 1,2,4-TMB; 1,3,5-TMB; 1,2-DCA; benzene; chloroform; cis-1,2-DCE; ethylbenzene; naphthalene; PCE; TCE; and vinyl chloride. SA 107 is under the influence of the IC 35 SVE system.

Soil: Leaks and spills have impacted the site soil. Soil risks, driven by dioxins/furans, are greater than the risk management range for unrestricted use and within the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. Lead was detected at concentrations above the unrestricted screening level, but below the restricted screening level. The carcinogenic risk is 5×10^{-4} for the residential scenario and 4×10^{-5} for the occupational worker scenario. The non-carcinogenic HI for the residential scenario is 5, due to arsenic, dioxins/furans, and 2-methylnaphthalene, and the occupational worker scenario is less than 1. Lead concentrations exceed levels for the protection of surface water quality. The COCs are dioxins/furans and lead.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is 1.3×10^{-4} and may be higher when exposure to all pathways, including groundwater, is considered.

Rationale for Selected Remedies: The expected future use of SA 107 is industrial. Alternatives VOC3 and Non-VOC4a were selected to address VOCs in SSG that exceed the risk management range for unrestricted use and to address lead and dioxins/furans in soil that pose a threat to surface water quality. The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG is greater than the risk management range. Also, only one location was sampled for SSG at SA 107 and restricted use alone may not be sufficient to protect workers. For these reasons, VOC3 was selected over VOC2. The ICs and ECs established by Alternative VOC3 will restrict the use of the site and require the installation of engineered controls in any future buildings or during significant remodeling of existing buildings to mitigate the potential for VOCs in SSG from migrating into buildings and impacting occupants via the vapor inhalation pathway. The parcel and lots affected by the IC compliance buffer for Alternative VOC3 are Parcel B2, Lots 118, 119, and 120.

The industrial use target volume (combined with CS T-057 and SA 080) under Alternative Non-VOC4a is 110 cubic yards, and was selected to remove lead and dioxins/furans in soil that exceed levels protective of surface water quality. The unrestricted use target volume of 110 cubic yards under Non-VOC4b was not selected. Based on sampling results, and to protect surface water, ECs to maintain surface cover are needed in the vicinity of sample CST57SB021. Due to the need for ECs, and because the future use is expected to be industrial, Non-VOC4a was selected over Non-VOC4b. The ICs established by Alternative Non-VOC4a will restrict the use of the site in order to limit risk from soil exposure because soil risks exceed the risk management range for unrestricted use and the HI for unrestricted use exceeds 1. The ICs require that if existing buildings on the site are demolished or significantly remodeled, sampling must be done, the existing surface cover must be maintained, or other soil/sediment ECs implemented, as warranted, as long as levels protective of surface water quality as shown in Table 2-4 are exceeded.

The selected alternatives result in restricted land use with ICs (deed restrictions and SLUC) prohibiting residential and other sensitive uses.

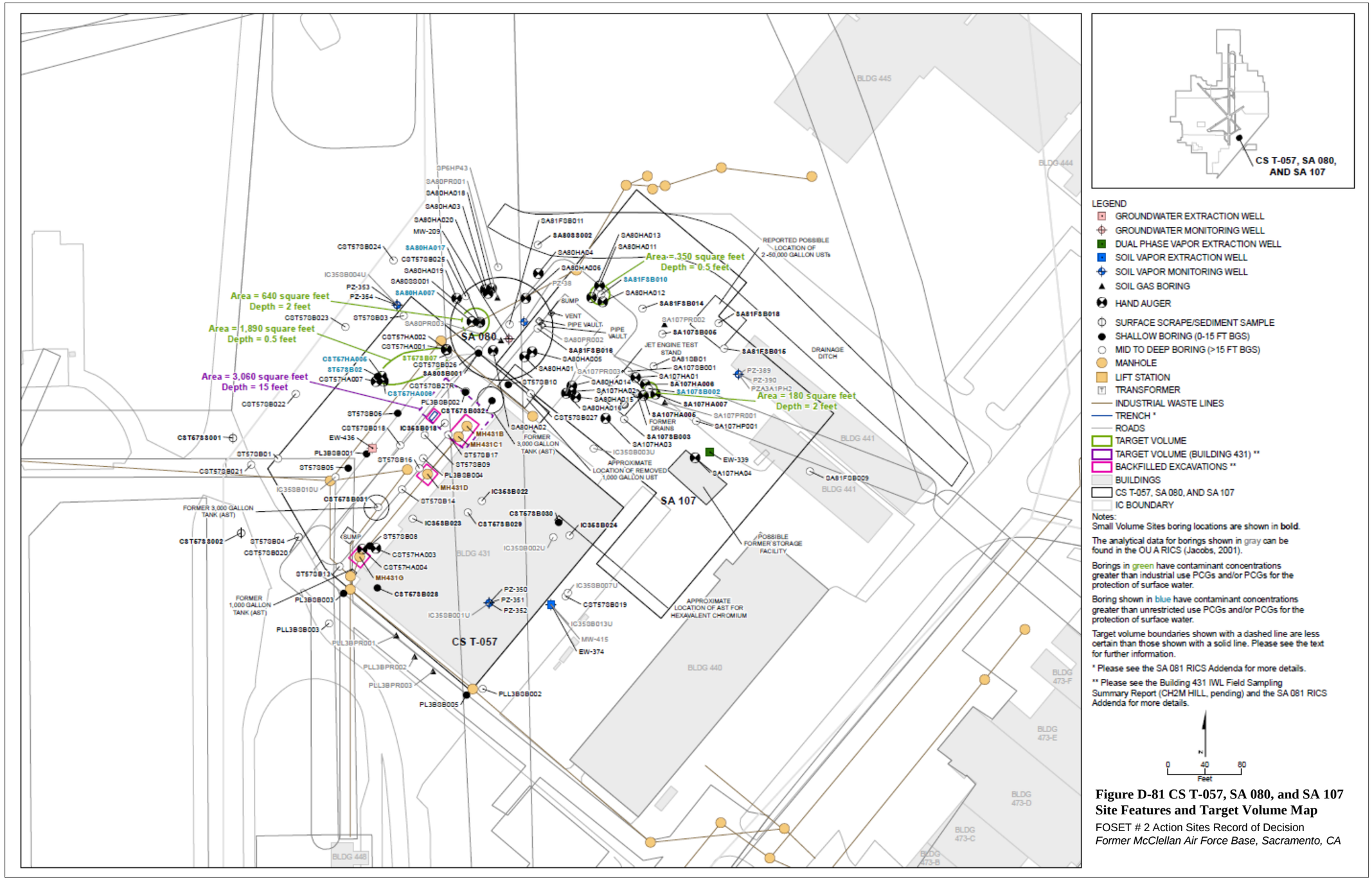

Figure D-81 CS T-057, SA 080, and SA 107 Site Features and Target Volume Map

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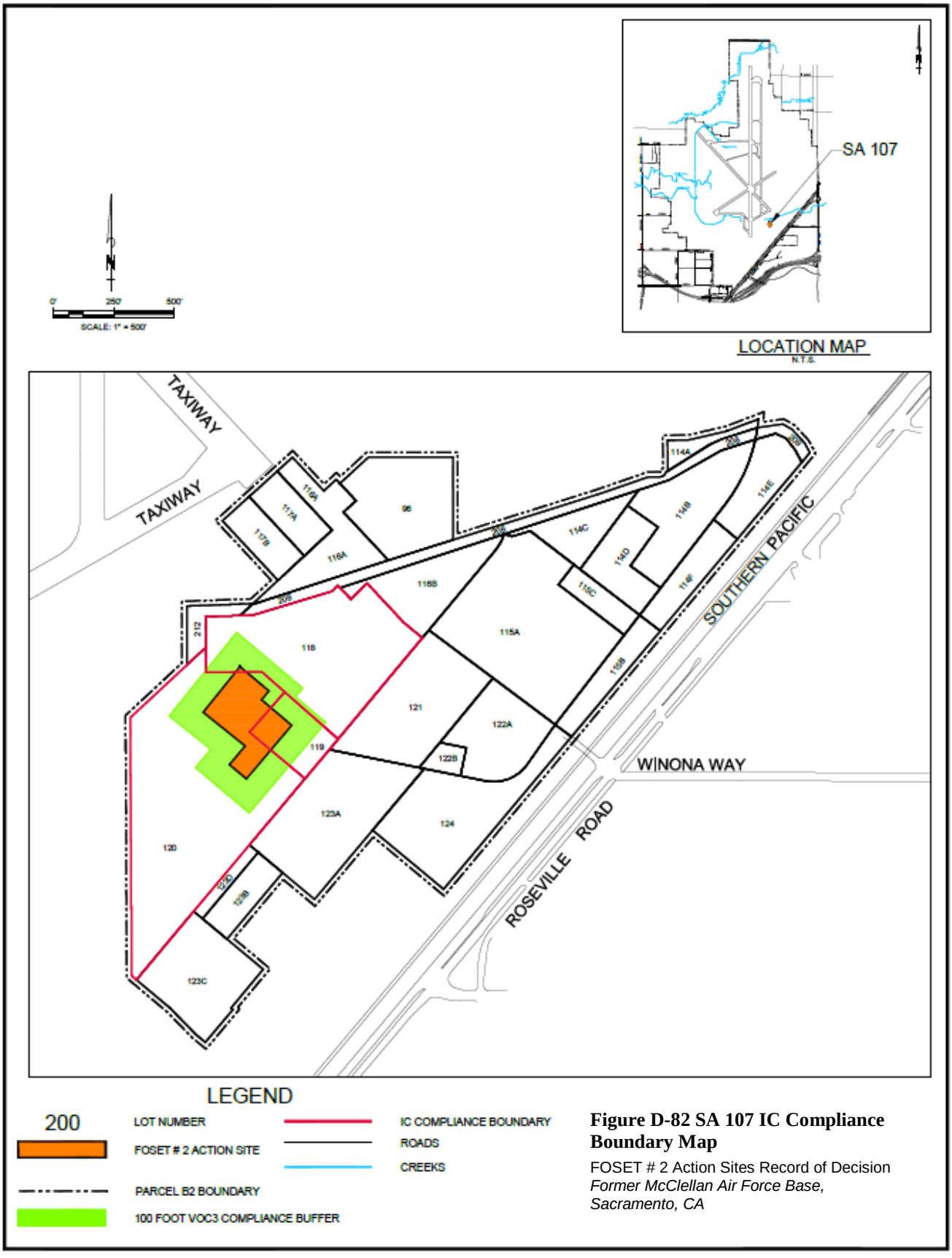

Figure D-82 SA 107 IC Compliance Boundary Map

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SA 109 (F2): This site consists of a portion of Magpie Creek. Magpie Creek has received surface water runoff from the east-central portion of McClellan since the late 1930s through sheet flow directly into the creek and through a system of swales and subsurface drains that discharge directly into the creek. In 1940, the creek was modified from its original course to the present one, and the creek bottom was lined with corrugated steel. In 1971, the creek banks were lined with concrete.

Selected Remedy: Non-VOC4b (Excavation and Disposal–Unrestricted Land Use)

Contaminants Addressed: metals, pesticides, and PCBs in soil

Shallow Soil Gas: COCs were not identified at SA 109 (F2) because this site is not considered a source of VOCs in soil gas.

Soil: Runoff, storm drainage, discharges from nearby contaminated sites, and leaks in the corrugated liner within the creek have impacted the surface soil. Soil risks, driven by cadmium and PCBs, are at the high end of the risk management range for unrestricted use and within the risk management range for restricted use. In addition, the HI for unrestricted use is greater than 1. Lead was also detected above unrestricted, but below restricted use cleanup levels. The carcinogenic risk for the residential scenario is 1×10^{-4} and the non-carcinogenic HI is 12, due to arsenic, cadmium, zinc, Aroclor-1254, and Aroclor-1260. The carcinogenic risk for the occupational worker scenario is 9×10^{-6} and the non-carcinogenic HI is less than 1. Cadmium, lead, PCBs, and pesticides were detected at concentrations greater than levels for the protection of surface water quality. The COCs identified in soil are cadmium, alpha chlordane, gamma chlordane, DDD, DDE, DDT, dieldrin, lead, Aroclor-1254, and Aroclor-1260. It should be noted that Ra-226 was previously a soil COC at SA 109; however, Ra-226 contamination was removed during the SVS and Building 252 Radiological NTCRA and is no longer a COC for SA 109. A total of 16,160 cubic yards of contaminated soil/sediment, metal liner, and gunite/shotcrete were removed.

Combined Soil and Shallow Soil Gas Risks: The maximum estimated risk to a commercial/industrial worker for combined exposure to soil and SSG was not calculated because no COCs were identified for SSG at SA 109.

Rationale for Selected Remedies: The expected future use for site SA 109 is industrial. Alternative Non-VOC4b was selected to address cadmium, lead, PCBs, and pesticides in soil that exceed the HI of 1 for unrestricted use and that pose a threat to surface water quality. The RAR for SA 109 did not sufficiently document that all of the COCs were removed; for example, specific sampling locations (sidewall or bottom samples) and sampling depths were not provided for confirmation samples. If contamination is found when delineation sampling is done for the remaining contaminated soil, the backfill placed when the SVS and Building 252 Radiological NTCRA was completed will be removed and stockpiled for use in backfilling the excavations associated with the selected remedy. If the delineation samples indicate that contamination has been addressed, additional excavation will not be necessary. The unrestricted use target volume under Alternative Non-VOC4b is 2,778 cubic yards, and was selected to remove cadmium, lead, PCBs, and pesticides in soil that exceed unrestricted use cleanup levels and levels protective of surface water quality. The industrial use target volume under Non-VOC4a is the same (2,778 cubic yards), but was not selected because there will be no need to implement ICs or ECs for the protection of human health and surface water quality once the excavation is complete.

The selected alternative results in unrestricted land use.

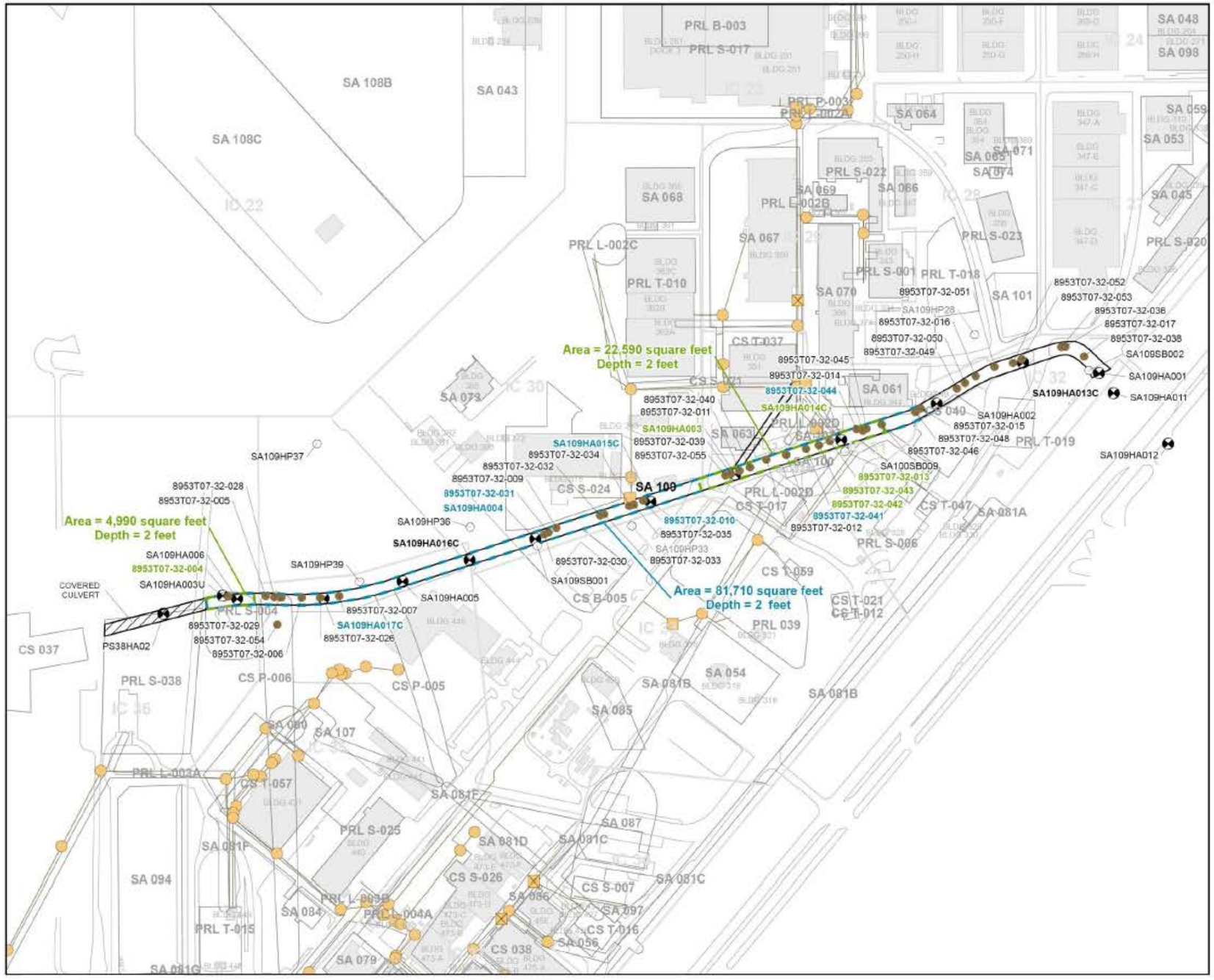

Figure D-83 SA 109 Site Features and Target Volume Map

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