FACT SHEET/STATEMENT OF BASIS

Request for Corrective Action Complete Status
for
Five Solid Waste Management Units
And Eight Areas of Concern

Holloman Air Force Base
New Mexico

RCRA Permit No. NM6572124422

January 28, 2022

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ATTACHMENT

Draft Permit - Modified Tables, Permit Appendix 4-A, Summary of Solid Waste Management Units/Areas of Concern, Table A, Table B, and Table C

ACRONYMS AND ABBREVIATIONS

AAF	Army Air Field
ACM	Accelerated Corrective Measures
AFB	Air Force Base
AOC	Area of Concern
bgs	Below ground surface
Bhate	Bhate Environmental Associates, Inc.
CA	Corrective Action
CAC	Corrective Action Complete
CFR	Code of Federal Regulations
COPC	Chemical of potential concern
COPEC	Chemical of potential ecological concern
cy	Cubic yards
DCE	Dichloroethene
DQO	Data quality objectives
DPT	Direct push technology
DRMO	Defense Reutilization Management Office
DRO	Diesel-range organic
ESL	Ecological screening levels
EM	Exposure model
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
ERPIMS	Environmental Resources Program Information Management System
°F	Degrees Fahrenheit
ft	Feet or foot
FS/SOB	Fact Sheet/Statement of Basis
GRO	Gasoline-range organic
HAFB	Holloman Air Force Base
HI	Hazard Index
HSWA	Hazardous and Solid Waste Amendments
IM	Interim measure
IRP	Installation Restoration Program
JP-4	Jet Fuel (Formula 4)
LNAPL	Light non-aqueous phase liquid
LTM	Long term monitoring

MCL	Maximum contaminant level
MDL	Method detection limit
MEC	Munitions and Explosives of Concern
µg/m^3	Micrograms per cubic meter
µg/g	Micrograms per gram
µg/kg	Micrograms per kilogram
µg/L	Micrograms per liter
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
MRS	Munitions Response Site
MTBE	Methyl tertiary butyl ether
NCS	Nitrate Characterization Study (Basewide)
ND	Non-detect or not detected
NFA	No further action
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMGWQ	New Mexico Groundwater Quality
NMRBDM	New Mexico Risk Based Decision Making
NMSA	New Mexico Statutes Annotated
NMWQCC	New Mexico Water Quality Control Commission
NOD	Notice of Disapproval
NTCRA	Non-Time Critical Removal Action
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
pCi/g	Picocuries per gram
PCS	Petroleum-contaminated soil
PID	Photoionization detector
PMR	Permit modification request
ppm	Parts per million
PSTB	Petroleum Storage Tank Bureau
RAR	Release Assessment Report
RBSL	Risk-based screening level
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
SI	Site Investigation
SLERA	Screening level ecological risk assessment
SSL	Soil Screening Level

SSTLs	Site-specific Target Levels
SVE	Soil vapor extraction
SVOC	Semi-volatile organic compounds
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCE	Trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total dissolved solids
TPH	Total petroleum hydrocarbon
TRPH	Total recoverable petroleum hydrocarbons
USAF	United States Air Force
UST	Underground storage tank
UTL	Upper tolerance limit
VCM	Voluntary Corrective Measures
VOC	Volatile organic compound

FACT SHEET/STATEMENT OF BASIS FOR APPROVAL OF CORRECTIVE ACTION COMPLETE FOR FIVE SOLID WASTE MANAGEMENT UNITS AND EIGHT AREAS OF CONCERN RCRA PERMIT NO. NM6572124422 HOLLOMAN AIR FORCE BASE NEW MEXICO

INTRODUCTION

Under authority of the New Mexico Hazardous Waste Act (Section 74-4-1 et seq., NMSA 1978, as amended, 1992) and the New Mexico Hazardous Waste Management Regulations (20.4.1 NMAC), incorporating the Resource Conservation and Recovery Act [RCRA] implementing regulations at 40 Code of Federal Regulations 260 through 272), the New Mexico Environment Department (NMED) can approve or deny hazardous waste permits, closure plans, permit modifications, and amendments. Under this authority, NMED intends to approve, pending public input into this decision, a Class 3 permit modification request (PMR) received from the United States Air Force Holloman Air Force Base (Permittee or HAFB) for the Hazardous Waste Permit (Permit) pursuant to 20.4.1.900 NMAC (incorporating 40 CFR § 270.42(c)).

If approved, the proposed permit modifications would grant Corrective Action Complete (CAC) Without Controls status for nine Solid Waste Management Units/Areas of Concern (SWMUs/AOCs) and modify Part 4 of the Permit to move these SWMUs/AOCs from Part 4, Appendix 4-A, Table A (Summary of Solid Waste Management Units and Areas of Concern Requiring Corrective Action) to Appendix 4-A, Table B (Summary of Solid Waste Management Units and Areas of Concern with Corrective Action Complete Without Controls).

The proposed permit modifications would also grant CAC With Controls status for two SWMUs and one AOC and move these sites from Table A to Table C (Summary of Solid Waste Management Units and Areas of Concern with Corrective Action Complete With Controls). In addition, one SWMU is proposed to continue land use controls but discontinue engineering controls.

Proposed changes to Tables A, B and C are shown in redline/strike-out in the tables provided in the Attachment to this Fact Sheet/Statement of Basis (FS/SOB).

The sites addressed have been investigated under RCRC and the HWA and their corresponding implementing regulations. Based on the information collected, NMED has concurred that the thirteen sites qualify for CAC, either with or without controls, since the available data for the sites indicate that any remaining contaminants do not pose an unacceptable level of risk under current and projected future land use. Therefore, NMED intends, pending public input, to implement the permit modification.

The following sites, indicated by SWMU/AOC designations and corresponding current ERP Site designations, are proposed for CAC and will be moved from Table A to Table B or Table C, as noted:

SWMU/AOC ID Number	ERP Site ID	SWMU/AOC Name	Action
SWMU 113B	DP-030/SD-033	Grease Trap Disposal Pits and Cooking Grease Disposal Trenches	Table A to Table B
SWMU 122	TU521	Building 702 Waste Oil Tank	Table A to Table C
SWMU 123	TU521	Building 704 Waste Oil Tank	Table A to Table C
SWMU 141	SD027	Pad 9 Drainage Pit	Table A to Table B
SWMU 197	OT-14	Former Entomology Shop	Table C
AOC-H	SS018	VOC Spill Site	Table A to Table C
AOC-T	SS002	POL Storage Tank Spill Sites 1 & 2	Table A to Table B
AOC-UST-889	TU515	Building 889 UST [Underground Storage Tank]	Table A to Table B
AOC-823	SS823	Building 823 TPH in Soil	Table A to Table B
AOC-851	TS851	Former Skeet Range	Table A to Table B
AOC-859	TS859 (SR859a)	Former Skeet Range 2	Table A to Table B
AOC-862	TS862 (TS862a)	Jeep Target Area Skeet Range	Table A to Table B
AOC-1194	TU904	Building 1194 Septic System	Table A to Table B

A. FACILITY DESCRIPTION

HAFB is located in south central New Mexico, in north-central Otero County, approximately 75 miles north-northeast of El Paso, Texas (see Figure A.1). HAFB occupies approximately 59,830 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The U.S. Army's White Sands Missile Range testing facilities and White Sands National Monument occupy additional land extending north and west from the base. Both private and publicly owned lands border the remainder of HAFB. The major highway servicing HAFB is U.S. Highway 70, which runs southwest from the town of Alamogordo and separates HAFB from publicly owned lands to the south. Alamogordo, which has a population of approximately 31,000, is located approximately 7 miles east of the base.

HAFB was first established in 1942 as Alamogordo Army Air Field (AAF). From 1942 through 1945, AAF served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations ceased at the base. In 1947, Air Material Command announced the airfield would be its primary site for the testing and development of un-manned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed Holloman Air Force Base. In 1968, the 49th Tactical Fighter Wing arrived at HAFB and has remained, under various iterations, since. Today, HAFB also serves as the location of the German Air Force Tactical Training Center (AECOM 2018).

The offices of the Permittee is located at the following address: Department of the Air Force, Headquarters, 49th Wing, Holloman Air Force Base, New Mexico, 88330-8458. The Permittee's primary contact for the action is Mr. Adam Kusmak, Chief, Installation Management Flight, 49 CES/CEI, 550 Tabosa Avenue, Holloman AFB, NM 88330.

B. HISTORY OF ENVIRONMENTAL COMPLIANCE

Investigation and remediation of SWMUs and AOCs at HAFB is conducted under the RCRA Permit issued by NMED. A Hazardous and Solid Waste Amendments (HSWA) permit was issued to HAFB by the United States Environmental Protection Agency (EPA) in 1991 and became effective on September 25, 1991. It was reissued by NMED on February 24, 2004. A Permit renewal application was submitted to NMED on February 26, 2015 and is currently under review. Initially, a total of 265 sites were identified and investigated during the assessment process and listed on Table A. Currently, 25 sites remain on Table A. The remaining sites have achieved CAC status and were transferred to Table B or Table C.

Section F below briefly describes the location, history, evaluation of relevant information, and the basis for determination for each SWMU/AOC proposed for CAC. More detailed descriptions of the investigative activities for each SWMU/AOC can be found in the accompanying references found in Section G, which are included in the Administrative Record. SWMU/AOC locations are shown on Figure B.1.

C. ADMINISTRATIVE RECORD

The Administrative Record for this proposed action consists of the Class 3 PMR, this FS/SOB, the Public Notice, the draft Permit, consisting of revised Tables A, B and C, and supporting documentation received for each site. The complete Administrative Record may be reviewed at the following location during the public comment period:

NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6313
Telephone: (505) 476-6000
Monday-Friday: 8:00 am – 5:00 pm

A copy of the FS/SOB, the Public Notice, the November 2004 Permit that contains Appendix 4A, Tables A, B, and C, the Class 3 Permit Modification Request (PMR) dated January 24, 2020, and the revised Permit Tables A through C are also available electronically on the NMED website at: https://www.env.nm.gov/hazardous-waste/hafb/.

To obtain a copy of the Administrative Record or a portion thereof, in addition to further information, please contact the Hazardous Waste Bureau at (505) 476-6000 at the address given above. NMED will provide copies, or portions thereof, of the administrative record at a cost to the requestor.

D. PUBLIC PARTICIPATION

The Permittee issued a public notice for the proposed PMR on February 7, 2020 for the following five SWMUs: SWMU 113B (DP030/SD033), SWMUs 122 and 123 (TU521), SWMU 141 (SD027), and SWMU 197 (OT014) and seven AOCs: AOC-T (SS002), AOC-UST-889 (TU515), AOC-823 (SS823), AOC-851 (TS851), AOC-859 (TS859), AOC-862 (TS862), and AOC-1194 (TU904). The PMR also included a petition for corrective action complete status with controls for AOC-H (SS018). This began a 60-day public comment period on the PMR, which continued until April 7, 2020.

Persons who wished to comment on the proposed modifications or request a public hearing had an opportunity to submit written and/or electronic mail (e-mail) comment(s) during the comment period. Additionally, a public meeting was held on March 10, 2020 in Alamogordo, in accordance with NMAC 20.4.1.901, as part of the 60-day public comment period on the PMR required by the regulations at 40 CFR §270.42(c)(5). There were no attendees at the public meeting and no comments were received during the comment period.

NMED issued a public notice on **January 28, 2022** to announce the beginning of a 60-day comment period that will end at **5:00 p.m. MDT, March 28, 2022**. Any person who wishes to comment on this action or request a public hearing should submit written or e-mailed comment(s) with the commenter's name and address to the physical or e-mail address below. Only comments and/or requests received on or before **5:00 p.m. MDT, March 28, 2022** will be considered.

Dave Cobrain, Program Manager
Hazardous Waste Bureau - New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6313
Or via e-mail: dave.cobrain@state.nm.us
Ref: Proposals for CAC for 13 Sites at HAFB

Written comments must be based on the administrative record. Documents in the administrative record need not be re-submitted if expressly referenced by the commenter. Requests for a public hearing shall provide: (1) a clear and concise factual statement of the nature and scope of the interest of the person requesting the hearing; (2) the name and address of all persons whom the requestor represents; (3) a statement of any objections to the proposed action, including specific references; and (4) a statement of the issues which such persons propose to raise for consideration at the hearing. Written comments and requests for Public Hearing must be filed with Mr. Dave Cobrain on or before **5:00 p.m. MST, March 28, 2022**. NMED will provide a thirty (30) day notice of a public hearing, if scheduled.

All comments submitted will be considered in formulating a final decision and may cause the draft permit to be modified. NMED will respond in writing to the comments. This response will specify which provisions, if any, of the draft permit have been changed in the final decision and the reasons for the changes. All persons who have submitted written comments or who

requested notification of the final decision will be notified of the decision by mail. These responses also will be posted on NMED website.

After consideration of all written public comments received, NMED may issue a final permit. NMED will make the final decision publicly available and will notify the Applicants by certified mail. All persons who submitted written comments, requested a hearing, or requested notification of the final decision will be notified of the decision by first class mail. NMED's decision will constitute a final agency decision and may be appealed as provided by the HWA (Chapter 74, Article 4 NMSA 1978).

For additional information from NMED, or to request a public hearing, contact:

Dave Cobrain, Program Manager
NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
E-mail: dave.cobrain@state.nm.us
Telephone: (505) 476-6055

E. NEXT STEPS

NMED will notify the Permittee and each person on the public comment mailing list of the final decision. The final decision will become effective 30 days after service of the decision, unless a later date is specified, or review is requested in accordance with NMAC 20.4.1.901.

Arrangements for Persons with Disabilities

Any person with a disability requiring assistance or auxiliary aid to participate in this process should contact Tina Montoya no less than ten days prior to the end of the public comment period at the following address: New Mexico Environment Department, P.O. Box 5469, 1190 St. Francis Drive, Santa Fe, New Mexico, 87502-6110, (505) 372-9569. TDD or TDY users please access Ms. Montoya's number via the New Mexico Relay Network at 1 (800) 659-8331.

Non-Discrimination Statement

NMED does not discriminate on the basis of race, color, national origin, disability, age, or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, you may contact:

Kathryn Becker, Non-Discrimination Coordinator
New Mexico Environment Department
1190 St. Francis Dr., Suite N4050
P.O. Box 5469
Santa Fe, NM 87502
(505) 827-2855
NMED.NDC@state.nm.us

If you believe that you have been discriminated against with respect to a NMED program or activity, you may contact the Non-Discrimination Coordinator identified above or visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

F. DESCRIPTION OF SWMUS AND AOCS PROPOSED FOR CAC

The following subsections describe the location, history, and land use conditions for each SWMU/AOC. A summary of relevant information from previous investigations and a basis for the CAC determination for the sites are also presented in this section.

F.1 SWMU 113B (DP-030/SD-033), GREASE TRAP DISPOSAL PITS AND COOKING GREASE DISPOSAL TRENCHES

F.1.1 Location/Unit Description

SWMU 113B combines two Installation Restoration Program sites, DP-030, Grease Trap Disposal Pits, and SD-033, Cooking Grease Disposal Trenches. They are located in the southeastern portion of HAFB, northwest of the airfield and Sabre Road, and west of the Fire Protection Training Area (URS 2017c). DP-030 is located immediately north of the unpaved service road and encompasses approximately 0.76 acre. SD-033 is located south of the unpaved service road and encompasses approximately 0.17 acre (URS 2017c). The sites are undeveloped and moderately vegetated with shrubs and native grasses. The location of SWMU 113B is depicted in Figure F.1.1.

F.1.2 History/Current and Anticipated Future Land Use

Historically, the pits and trenches at SWMU 113B received waste from HAFB grease traps, oil/water separators, and grit from the wastewater treatment system. Occasionally, the pits and trenches would receive sludge from vacuum trucks used to unclog sewer lines at the Primate Research Laboratory (Radian, 1992).

Soil and groundwater samples collected from the Grease Trap Disposal Pits during an investigation demonstrated that soil and waste sludge samples contained volatile organic compounds (VOCs), metals, oil and grease, and pesticides (Radian, 1992).

There are currently no plans for HAFB to expand operations in the area occupied by SWMU 113B, and the current and anticipated future land use of SWMU 113B is classified as industrial (ACC, 2011).

F.1.3 Evaluation of Relevant Information

During an interim corrective measure (ICM), eleven trenches were excavated between December 2015 and February 2016 (URS, 2018a). Confirmation soil samples were collected to verify that all contaminated material was removed and any remaining chemical constituents in the soil were below NMED Soil Screening Levels (SSLs). A total of 1,089 cubic yards of contaminated soil was disposed of at the Otero/Greentree Regional Landfill in Otero County (URS, 2018a). Three rounds of confirmation samples were collected following excavation and analyzed for VOCs, metals, polychlorinated biphenyls, and total petroleum hydrocarbon-

gasoline- and diesel-range organics. Following confirmation that remaining concentrations of analytes in soil were below NMED residential soil screening levels (SSLs), the trenches were backfilled with clean soil, and the disturbed area was re-seeded (URS, 2018a). Figure F.1.1 depicts the extent of excavation at the site.

The waste disposed in the former trenches impacted underlying groundwater at sites DP-030 and SD-033. The primary contaminant of concern at the sites is trichloroethylene (TCE) in groundwater. In order to evaluate the migration of TCE, four groundwater monitoring wells were added to the existing well network of five monitoring wells between May 2015 and February 2017 (URS, 2018a). The most recent groundwater sampling event (April 2018) indicated TCE concentrations continue to exceed the EPA maximum contaminant level (MCL) of 5 µg/L in samples collected from monitoring wells MW30&33-02 (16 µg/L) and MW30&33-03 (18 µg/L), and current data suggests the TCE plume has stabilized (URS, 2018a). Figure F.1.2 depicts the groundwater well network and 2018 TCE concentrations at the site.

Total dissolved solids (TDS) were detected in all groundwater samples from the monitoring well network at concentrations ranging from 19,000 milligrams per liter (mg/L) (MW30&33-04) to 28,000 mg/L (MW30&33-02) (URS, 2018a). All historical site sample results for TDS have exceeded the 10,000 mg/L potable water threshold, and groundwater beneath sites DP-030/SD-033 is not considered a potable water source.

Qualitative risk assessments were performed for soil, groundwater, and soil vapor to determine if the potential exists for unacceptable risk to impact human or ecological receptors (URS, 2018a). The groundwater beneath the sites is not considered a potable drinking water source due to the high TDS concentrations, and there is no potential for dermal contact. All soils exceeding NMED residential SSLs were excavated and removed during the ICM; therefore, any remaining chemical constituents will not impact groundwater beneath the sites (URS, 2018a). Due to the depth of groundwater and high TDS, the only viable risk pathways remaining include potential indoor vapor intrusion from VOCs.

To investigate the potential for TCE vapor intrusion from groundwater to impact human health and the environment, two vapor monitoring wells (VP-30&33-01 and VP-30&33-02) were installed and soil vapor samples collected (URS, 2018a). Based on soil vapor sample data collected from a depth of 5 ft below ground surface (bgs), TCE does not exceed NMED screening levels in soil vapor (NMED, 2017a). The single soil vapor exceedance of a residential vapor intrusion screening level (VISL) was for carbon tetrachloride. Carbon tetrachloride does not pose a long-term risk at the sites since the source has been removed and it is an industrial site with no current or planned residential land use. Vapor phase concentrations will likely continue to decline, and its detection at only one vapor monitoring well and limited trace 'estimated' detections in groundwater indicates that its presence is limited in the subsurface and does not extend over the entire site (URS, 2018a).

F.1.4 Basis for Determination

DP-030/SD-033 (SWMU 113B) has been determined to be suitable for Corrective Action Complete Without Controls status. The SWMU has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants present do not pose an unacceptable level of risk to human health or ecological receptors under the current or reasonably forseeable future land use.

F.2 SWMU 122 AND SWMU 123 (TU521), BUILDING 702 AND 704 WASTE OIL TANKS

F.2.1 Location/Unit Description

SWMUs 122 and 123 are former underground waste oil tanks located within the northeastern portion of the main base area in an industrial area that served as a bulk fuels depot and petroleum, oils, and lubricants (POL) yard off of Delaware Avenue. SWMUs 122 and 123 are located at the northwestern and northeastern corners, respectively, of the wash rack inside the POL facility (NationView, 2012). The locations of SWMUs 122 and 123 are depicted in Figure F.2.

F.2.2 History/Current and Anticipated Future Land Use

The two former underground waste oil tanks received oil and fuels from two former underground oil/water separators (SWMUs 21 and 22) that collected wash water from the POL wash racks. They are located in an industrial area of HAFB primarily covered by concrete or asphalt pavement, and there are no ecological habitats in or adjacent to the site. During the POL wash rack renovation performed in the early 1990s, the two waste oil tanks (SWMUs 122 and 123) and the associated oil/water separators (SWMUs 21 and 22) were removed and replaced with a wash pad and below ground concrete containment sump.

The current and anticipated future land use of SWMUs 122 and 123 is classified as industrial.

F.2.3 Evaluation of Relevant Information

Numerous investigations and remedial actions for SWMUs 122 and 123 have been documented in multiple reports with detailed summaries included in the *Final RCRA Facility Investigation Report, SWMUs 122 and 123, June 2012* (2012 RFI Report, NationView, 2012). Based on the results of the previous investigations and remedial actions, additional soil sampling conducted in 2009, and a human health risk assessment in the 2012 RFI Report, HAFB recommended No Further Action (NationView, 2012). In a letter dated August 2014, NMED disapproved the 2012 RFI Report and requested additional investigative work surrounding well SWMU122-MW09, which had reported xylene concentrations exceeding the New Mexico Water Quality Control Commission (NMWQCC) standard in NMAC 20.6.2.3101 (NMED, 2014a). NMED also requested completion of a passive soil gas survey to assist in determining the extent of soil contamination and locations for potential additional exploratory soil borings and wells (NMED, 2014a).

Investigative activities including a soil gas survey and groundwater sampling were completed during April 2017 to evaluate whether SWMUs 122 and 123 present an unacceptable risk to human health or the environment (AECOM, 2018). The soil gas survey performed at SWMUs 122 and 123 included the installation of an initial eight boreholes using direct-push drilling technology and on-site mobile laboratory gas chromatography (GC) to collect field measurements in real time. The purpose of the soil gas survey was to assist with delineation of total xylenes previously detected in groundwater at SWMU122-MW09. Based on the results of the initial eight soil gas boreholes, an additional set of eight step-out boreholes were advanced based on field photoionization detector (PID) readings and the VOC results provided by the mobile GC (AECOM, 2018).

Soil gas field screening recorded during the SWMUs 122 and 123 soil gas survey did not indicate the presence of Contaminants of Concern (COCs). The highest PID field screening recorded during the survey was 385 ppm detected in TU521-SB-06 at 9 ft bgs (AECOM, 2018). Step-out boreholes advanced downgradient of this location did not detect other elevated readings. The laboratory analytical results for soil gas from this same interval were reported at less than the limit of detection for all benzene, toluene, ethylbenzene, and xylene constituents by the mobile GC laboratory. In the same borehole (TU521-SB-06), a sample screened at 5 ft bgs detected of VOCs with a PID at a concentration of 0.2 ppm. The highest PID reading recorded during the sampling event was 5.6 ppm at TU521-SB-10 at 5 ft bgs (AECOM, 2018). No other PID field screening results indicated the presence of COCs.

The mobile laboratory soil gas analytical results contained one exceedance at TU521-SB-11 at 9 ft bgs with a concentration of 140 $\mu g/m^3$, which is above the residential soil gas VISL for benzene of 120 $\mu g/m^3$ but below the NMED industrial VISL of 588 $\mu g/m^3$ (AECOM, 2018). Benzene results from every other borehole were below the residential soil gas VISL. Ethylbenzene, m,p-xylene, o-xylene, and toluene results were reported at values at least an order of magnitude lower than their respective soil gas VISLs. None of the step-out boreholes contained VOC concentrations by field screenings or mobile laboratory analysis (AECOM, 2018).

Groundwater was sampled and analyzed to reassess the concentrations of total xylenes found in SWMU122-MW09 when sampled in 2009. Field water quality parameters results indicated that oxidation reduction potential measurements were negative and dissolved oxygen concentrations were low, indicating an anoxic environment where natural biodegradation may be occurring due to the presence of hydrocarbons. Groundwater sample results were compared to previous data and current regulatory standards, as applicable.

As discussed above, Total Petroleum Hydrocarbons (TPH) and xylene were identified in previous investigations at concentrations exceeding screening levels. Total xylenes are also present in groundwater. Analytical results for the groundwater sample collected at TU521 (SWMUs 122 and 123) during the April 2017 Supplemental RFI field activities indicate that groundwater at the site is not impacted by inorganic compounds (AECOM, 2018). No regulatory standards were exceeded for VOCs in the sample collected from SWMU122-MW09. Neither m,p-xylene nor o-xylene were detected above their limits of detection (0.8 µg/L and 0.4 µg/L, respectively)

(AECOM, 2018). This is in comparison to the sample results from 2009, wherein m,p-xylene was reported at a concentration of 465 µg/L and o-xylene at 260 µg/L for the sample collected from SWMU122-MW09 (NationView, 2012). TPH was temporarily discontinued as a NMED screening level at the time the samples were collected. The TDS concentration was 6,600 mg/L, which is below the NMWQCC threshold of 10,000 mg/L. Previously, the TDS concentration was also detected at a concentration below NMWQCC threshold at 8,130 mg/L (NationView, 2012).

Potential human receptors identified in the 2012 RFI Report (NationView, 2012) include residents, military and civilian workers, construction and maintenance workers, vendors and service providers, and transient visitors. Human use facilities at HAFB primarily consist of residential housing and industrial/operational facilities. HAFB also has a hospital, three schools, and a variety of other public service facilities. While groundwater is not locally extracted for potable use (due to high TDS), human exposure to pollutants may result from dermal contact, ingestion from physical contact with contaminated soils, or indoor vapor intrusion from VOC contamination of soils or groundwater.

Based on current land use and site activities at SWMUs 122 and 123, a commercial/industrial worker was identified as a receptor. Residential development at HAFB is limited and future land use is not anticipated to differ significantly from current land use; however, it is conservatively assumed that residential development at or near SWMUs 122 and 123 could potentially occur. Therefore, a resident was identified as a receptor under future conditions. Additionally, construction activities may occur in the future; therefore, a future construction worker was also identified as a potential receptor.

Potential ecological receptors include the flora and fauna of the surrounding HAFB ecosystem. SWMUs 122 and 123 are located in an industrial area and primarily covered by concrete or asphalt pavement. Furthermore, there are no ecological habitats (wetlands, aquatic, terrestrial, wooded, shrub, grassland, and/or desert) in or adjacent to SWMUs 122 and 123 (AECOM, 2018). No further ecological risk evaluation is warranted at SWMUs 122 and 123 at this time.

During the soil gas survey conducted during the RFI investigation, only one exceedance of NMED residential VISLs was detected; a relatively low benzene detection at TU521-SB-11, downgradient of SWMU-MW09 (AECOM, 2018). This was a localized occurrence, and there were no other notable benzene detections at the site. Benzene was not detected in the upper sample interval of the same borehole, and this differential vertical gradient indicates that natural attenuation is occurring (AECOM, 2018).

The focus of the soil gas investigation was on the area surrounding SWMU-MW09, and no COCs were discovered in this area above their respective screening levels. No exceedances were reported upgradient of SWMU-MW09, indicating that the elevated benzene result detected in TU521-SB-11 is not related to SWMU 122 or 123 (AECOM, 2018).

Groundwater samples collected from SWMU-MW09 contained no COCs above their respective screening levels although TPH analysis was not conducted during the 2017 sampling event.

Neither the soil gas survey nor the groundwater sampling results indicate that cross-gradient contaminant migration is occurring from SS002 (AOC T), POL Storage Tank Spill Site 1, or the POL tanks to TU521 (AECOM, 2018).

F.2.4 Basis for Determination

Since the sites are still in use, SWMU 122 and SWMU 123 (TU521) have been determined to be suitable for Corrective Action Complete with Controls status. The SWMUs have been characterized or remediated in accordance with contemporaneous applicable state and/or federal regulations, and the available data indicate that contaminants present currently do not pose an unacceptable level of risk to human health or ecological receptors under the current land use.

F.3 SWMU 141 (SD027), PAD 9 DRAINAGE PIT

F.3.1 Location/Unit Description

SWMU 141 (SD027), Pad 9 Drainage Pit, is an inactive wash rack area located within the airfield, east of Taxiway F and near forming Building T884. The location of SWMU 141 is depicted in Figure F.3.

F.3.2 History/Current and Anticipated Future Land Use

The former wash rack (concrete pad) at SWMU 141 was used to wash down drones and manned aircraft in the 1940s and early 1950s. The planes washed at the site were reportedly involved in the Cloud Sampling Program, a project studying fallout from nuclear explosions. Some of the aircraft in the program were used to collect air and particulate samples from clouds contaminated with fallout from above ground nuclear testing operations. Based on information provided to the U.S. Congress (Information Memorandum Package – Senator Glenn Hearing on Radioactive Waste, [Case, 1992]), HAFB (formerly the Alamogordo AAF) would most likely not have serviced the actual nuclear blast cloud sampling aircraft that participated in the program, due to lack of proximity to the Nevada Test Site or Pacific Proving Grounds. Rather, other program support aircraft providing services such as weather reconnaissance, cloud tracking, bomb delivery, inflight shock wave analysis, bomb damage assessment, and logistics and support were likely kept and maintained at the AAF (Case, 1992). Upon return from providing program support activities, the planes were washed down at Pad 9. Wash water would collect in the sump and discharge via the drainage pipe to the discharge pit.

The exact year when wash rack activities ceased at SWMU 141 is unknown. According to former military personnel, no manned or drone aircraft maintenance activities have occurred at SD027 since the cessation of the Cloud Sampling Program activities (Radian Corporation [Radian], 1993).

Currently, SWMU 141 has restricted access and there are no indoor structures. The current and anticipated future land use of SWMU 141 is classified as industrial.

F.3.3 Evaluation of Relevant Information

In 1994, Radian conducted a Phase II Remedial Investigation and found concentrations of ethylbenzene and total recoverable petroleum hydrocarbons (TRPH) that exceeded the NMED residential SSLs. NMED followed with a request for additional soil and groundwater characterization (Foster Wheeler and Radian, 1996).

A supplemental RFI was conducted in May through June 2006 to analyze and remove soil within the former drainage pit followed by subsurface soil and groundwater sampling within the wash rack, former drainage pit, and within the vicinity of the former discharge pipe (HydroGeoLogic, 2007). Based on the Supplemental RFI data, further investigation of SWMU 141 was recommended to determine appropriate remedial actions.

During Accelerated Corrective Measures (ACM), the investigation focused on soil and groundwater in and around the former drainage pit. Soil samples were collected at multiple depths, and exceedances of the then current direct contact NMED SSLs and NMED Vapor Intrusion SSLs were detected in soils that had accumulated in the wash rack sump (Tetra Tech, 2012). Concentrations in groundwater also exceeded the applicable NMED groundwater SSLs for residential tap water and vapor intrusion to indoor air (Tetra Tech, 2012). No radiation above background conditions was detected (Tetra Tech, 2012).

The quarterly Long-Term Monitoring Program sampling conducted December 2012 – August 2013 indicted that impacts to groundwater were greatest within and downgradient of the former drainage pit. The data indicated that a plume of groundwater contamination extended through the former drainage pit (Tetra Tech, 2013).

Additional groundwater sampling was conducted in April 2017. All detected analytes were measured at concentrations below the reporting limit or less than the NMWQCC standards and EPA MCLs, with the exception of total dissolved solids (TDS), total and dissolved arsenic, total chromium, dissolved manganese, dissolved iron, and benzene (URS, 2018b).

The only VOC exceedance in groundwater was for benzene, which was found at a concentration of 220 micrograms per liter (µg/L) in the sample from well SD27-MW05, exceeding the MCL (5 µg/L) (URS, 2018b). Benzene concentrations in SD27-MW05 had declined from a maximum value of 776 µg/L in January 2011. All the April 2017 TDS results exceeded the 10,000 milligrams per liter (mg/L) screening level (URS, 2018b). Groundwater at the site is not a drinking water source.

Based on an assessment of available data, groundwater at SWMU 141 does not present a current risk to human health due to aquifer properties, since the groundwater is not potable and soil contamination that exceeds the SSLs is present at depths greater than 10 feet bgs and therefore does not present a risk to potential residential receptors.

F.3.4 Basis for Determination

SWMU 141 (SD027) is proposed for Corrective Action Complete without Controls status. The SWMU has been characterized and residual contamination is present in soil and groundwater beneath the site. The available data indicate that contaminants present do not pose an unacceptable level of risk to human health or ecological receptors under the current or anticipated industrial land use.

F.4 SWMU 197 (OT-14) FORMER ENTOMOLOGY SHOP

F.4.1 Location/Unit Description

SWMU 197 (OT-14) occupies approximately two-tenths of an acre in the northwestern corner of the Civil Engineering yard on the main portion of HAFB. SWMU 197 is adjacent to Building 66 and is surrounded by paved areas. The topography of the site is relatively flat. The former Entomology Shop, SWMU 197, was located in Building 66. The location of SWMU 197 (OT-14) is depicted in Figure F.4.

F.4.2 History/Current and Anticipated Future Land Use

Historically, pesticides were stored and mixed on site and equipment (spraying units) for pesticide application across HAFB were stored and maintained on site. Mixing and maintenance activities were performed in an area outside of Building 66 (Radian, 1992).

SWMU 197 was first identified as a potential source for release of contaminants to the environment during the 1983 Installation Restoration Program (IRP) records search (CH2M-Hill, 1983) and was originally believed to be present at Building 67. The 1988 RCRA Facility Assessment (RFA) field inspection misidentified the site as SWMU 198 (IRP Site Number 14) (A.T. Kearney, 1988). A literature search along with interviews with HAFB personnel conducted in February 1991 provided the location of the site as adjacent to Building 66 in the Civil Engineering yard.

From 1968 to 1977, pesticide spraying and washing equipment was rinsed out in an open area adjacent to the building (Radian, 1992). Interviews with past employees indicated that mixing and rinsing of spraying equipment was performed outdoors, adjacent to Building 66. Phase I and II RFI investigations were conducted on site (Bhate, 2012). Currently, the area is occasionally used to stage emergency spill response equipment. The area is flat and covered with an engineered asphalt cap installed in 1996; the cap consists of geotextile fabric layer, a geomembrane layer, a geonet drainage layer, and an aggregate base layer topped with asphalt (Bhate, 2012). Concrete filled stanchions were placed around the perimeter of the asphalt cap to restrict site access. Currently there are no plans to alter or remove the SWMU 197 engineered asphalt cap (Bhate, 2012).

The current and anticipated future land use of SWMU 197 (OT-14) is classified as industrial.

F.4.3 Evaluation of Relevant Information

The asphalt cap, which has remained intact since it was installed, coupled with warm temperatures and shallow groundwater, has created an environment favorable to the degradation of pesticides, as shown in the results of the ACM Completion Report (Bhate, 2012). Concentrations of pesticides in on-site soil likely have degraded over the past 20 years (Bhate, 2012). The current soil and groundwater concentrations present at site SWMU 197 are protective of current and future commercial/industrial workers and future construction workers (Bhate, 2012).

SWMU 197 was recommended for No Further Action (now known as CAC) in 2012 (Bhate, 2012). CAC with Controls status was formally requested in 2015 (URS, 2015). Land use controls are still required at the site; however, the other controls may be discontinued.

F.4.4 Basis for Determination

SWMU 197 was recommended for No Further Action (now known as CAC) in 2012 (Bhate, 2012). CAC with Controls status was formally requested in 2015 (URS, 2015). Land use controls are still required at the site; however, the other controls may be discontinued.

F.5 AOC-H (SS018), VOC SPILL SITE

F.5.1 Location/Unit Description

AOC-H (SS018) is located on the south side of Building 281 within the main base area of HAFB, and the original spill area is approximately 0.35 acre. The location of AOC-H (SS018) is depicted in Figure F.5.

F.5.2 History/Current and Anticipated Future Land Use

Building 281 operated as a chrome plating shop until the late 1970s. When operations at Building 281 were discontinued, the full chromic acid vats were temporarily stored along the south wall of the building. An estimated 500 gallons of chromic acid was spilled on the ground within the storage area in the late 1970s (Bhate, 2008). A surface drainage ditch is located to the west of the storage area and a portion of the spill was suspected to have infiltrated the subsurface through this ditch. The area of the spill was estimated as 30 ft by 30 ft (Bhate, 2008).

Due to the release of chromic acid, several subsurface investigations were completed to evaluate potential chromium impacts within the subsurface. During an investigation in June and October 2007, detected concentrations of chromium in soils were below the NMED residential soil screening level; however, groundwater sample results identified 1,1-DCE as a COC with concentrations exceeding the NMWQCC standard of 5 µg/L (Bhate, 2008). Seven monitoring wells were installed to assist in the delineation of the groundwater contaminant plume in 2007 (Bhate, 2008).

1,1-DCE is a degradation compound of TCE. TCE was widely used at HAFB as a cleaning solution and is used in metal plating for approximately 40 years prior to the phase-out of the chemical in the early 1980s; therefore, impacts to groundwater are suspected to have originated upgradient (to the north) of AOC-H (Building 281) (Bhate, 2008). The 2007 investigation evaluated the surrounding buildings and identified three historical SWMUs associated with Buildings 282 and 283. Results from this investigation did not find any conclusive evidence of a 1,1-DCE source (Bhate, 2008).

Future land use is not expected to differ significantly from current industrial land use (Foster Wheeler, 2002). There are currently no plans for HAFB to change or expand operations in the area occupied by site SS018 (ACC, 2011).

The current and anticipated future land use of AOC-H (SS018) is classified as industrial.

F.5.3 Evaluation of Relevant Information

Between August and October 2009, a Phase II investigation was performed to define the nature and extent of the VOC impacts that were identified during the 2007 investigation. The 2009 Phase II investigation advanced 17 soil borings in the vicinity of the SWMUs associated with Buildings 282 and 283. In addition, 14 groundwater monitoring wells were installed. Groundwater data identified the main source area of 1,1-DCE (as well as TCE, PCE, and 1,1-DCA) originating in an area southwest of Building 281. A secondary source of 1,1-DCE was identified as originating from between Buildings 282 and 283. Based on available data, the 1,1- DCE plume appears to have migrated downgradient (southwest) of Building 282 (NationView, 2011a).

As a result of the extent of the VOC groundwater impacts identified during the 2009 Phase II investigation, a supplemental investigation was performed in 2012 (NationView, 2013). Twenty-three soil borings were advanced to 15 ft bgs with a single soil sample collected per borehole from the saturated zone (defined as that point where soil comes in contact with groundwater just below the water table) for chemical analysis (NationView, 2013). Eight of the boreholes were completed as permanent monitoring wells to further delineate the boundaries of the groundwater plumes (NationView, 2013).

During the 2012 investigation, all monitoring wells associated with AOC-H, along with five wells associated with OT-45, were sampled (NationView, 2013). The analytical results for three wells associated with UST-508, sampled during this same timeframe, were included to supplement the analytical data. Groundwater impacts included 1,4-dioxane, 1,1-DCE, TCE, PCE, 1,1-DCA, cis-1,2-DCE, and metals including aluminum, boron, iron, lithium, arsenic, total chromium, lead, manganese, and vanadium (NationView, 2013).

A risk evaluation determined that the groundwater concentrations do not pose an unacceptable risk based on the current commercial/industrial worker, future resident, and

future construction worker scenarios (NationView, 2013). However, the groundwater has been impacted by 1,1-DCE, TCE, PCE, 1,1-DCA, and cis-1,2-DCE at concentrations above applicable action levels of 5 µg/L, 5 µg/L, 5 µg/L, 25 µg/L, and 70 µg/L, respectively (NationView, 2013). Based on the groundwater data collected during 2007, 2009, and 2012, it appears that biodegradation may be occurring (NationView, 2013).

In order to evaluate the potential for biodegradation, groundwater samples were collected along two transects parallel to the direction of groundwater flow extending from the suspected origin of the COCs to the downgradient edge of the VOC plumes (NationView, 2013).

The compound-specific isotope analysis study provided evidence regarding the slow biodegradation of 1,1,1-trichloroethane, PCE, and TCE. The active mechanism appears to be a mix of reductive dechlorination and biological oxidation. In addition, the isotopic results suggested that there is not a single source for the observed groundwater impacts, but rather multiple sources (NationView, 2013).

RFI activities were conducted including the installation and sampling of two new groundwater monitoring wells in May 2015, and advancement and sampling of ten soil borings in November 2015. In addition to the well installation and soil boings, a qualitative risk evaluation was performed to identify current/future land uses, potential receptors, and the pathways by which these receptors may be exposed to the media at AOC-H. Data from these events have been provided in the 2017 Long-Term Monitoring (LTM) Report (URS, 2018d).

Additional interim measures were conducted in 2018 to evaluate the indoor air vapor intrusion pathway. Subsurface soil gas, sub-slab soil gas, indoor air, and ambient outdoor air samples were collected during two sampling events in March and June 2018 at the site (URS, 2019). Results of these sampling events were evaluated in conjunction with previous site characterization data for soils and groundwater, and a human health risk assessment was conducted.

Potential human health risk was evaluated for current on-site commercial/industrial workers, future on-site construction workers, and the hypothetical future on-site resident. Results of the risk assessment showed that for all receptors exposed to soil via direct contact (hypothetical future resident, commercial/industrial worker, and construction worker), there is no unacceptable exposure risk (URS, 2019). In addition, concentrations of soil contaminants are less than their corresponding dilution attenuation factors (DAF) 20, indicating that chemicals in soil are not leaching to groundwater at concentrations that may cause adverse health effects (URS, 2019). One chemical in soil (1,1-DCA) was detected at a maximum concentration greater than its risk-based SSL based on samples collected in 2009; however, 1,1-DCA was not detected in 14 soil samples collected from five boreholes in the same area in 2015, and based on the risk assessment it does not present an unacceptable risk for the direct contact exposure of groundwater for the construction worker (URS, 2019).

Because groundwater is encountered at depths of less than ten feet bgs and future construction may occur at the site, the future construction worker is expected to be exposed to groundwater contaminants through direct contact (dermal contact and incidental ingestion) and inhalation of volatiles in ambient air. The results of the evaluation show that risks for the construction worker exposed to groundwater are acceptable (URS, 2019).

Results of an ecological risk evaluation show that no complete exposure pathways for ecological receptors exist due to site development (almost exclusively structures, parking lots and/or roadways) and lack of surface water present at the site (URS, 2019). No further ecological risk evaluation is warranted at AOC-H.

Previous work with compound specific isotope analysis has indicated that some degree of natural attenuation is occurring (NationView, 2013), and this is supported by overall trends in cumulative, site-wide concentrations for chlorinated VOCs (URS, 2018a). Based on these conditions, and in conjunction with the human health and ecological risk assessment findings presented herein, site AOC-H has determined to be suitable for Corrective Action Complete with Controls. The administrative controls include a prohibition on future residential occupation built within the boundaries of the site until VOC concentrations in groundwater are demonstrated to be protective of a resident exposed to indoor air via vapor intrusion from groundwater; and a prohibition on future development of groundwater as a potable resource until all chemical concentrations in groundwater are demonstrated to be protective of a resident exposed to groundwater via all pathways associated with potable use of groundwater (URS, 2019).

When AOC-H (SS018) is deemed Corrective Action Complete with Controls, the site will enter into a long-term monitoring program to evaluate conditions of the groundwater plumes and risk under current uses over time (URS, 2019). This disposition is consistent with the continued use of the existing structures at AOC-H for mission critical support functions at HAFB. Continued groundwater monitoring will be conducted as described in the current approved groundwater monitoring plan (URS, 2015a).

F.5.4 Basis for Determination

AOC-H (SS018) has been determined to be suitable for Corrective Action Complete with Controls status. The AOC has been characterized in accordance with the current applicable state and federal regulations. Risk screening evaluation indicates that, with controls, the contaminants present do not pose an unacceptable level of risk to human health under an industrial land use scenario. The control limits site use to industrial land use until VOC concentrations in groundwater are demonstrated to be protective of a resident exposed to groundwater and indoor air via vapor intrusion from groundwater.

F.6 AOC-T (SS002) POL STORAGE TANK SPILL SITES 1 & 2

F.6.1 Location/Unit Description

AOC-T combines two sites, SS002 and SS005. SS002 is located in the northeast portion of the Main Base area approximately 900 ft west of the HAFB boundary. Site SS002 was previously occupied by fourteen 25,000-gallon aboveground diesel and jet fuel storage tanks (NationView, 2011b). An unknown amount of JP-4 and aviation gasoline was spilled at the site from the early 1960s to the late 1970s within the unlined bermed area when the fuel tanks were periodically overtopped (NationView, 2011b).

Site SS005 (POL Storage Tank Spill Site No. 2) resulted from a spill of approximately 30,000 gallons of JP-4 in 1978 when a drain valve for a 4-inch fuel line was accidentally left open (NationView, 2011b). HAFB personnel recovered approximately 28,500 gallons of the JP-4, with the remainder of the fuel seeping into the gravel base within the bermed POL storage tank area (NationView, 2011b). Fourteen storage tanks a the site were removed in 1987, but the tank saddles were left in place and covered with a 4-ft high soil mound that contained soil previously used for the berm that surrounded the tanks (NationView, 2011b). Because of the proximity of the two sites (SS002 and SS005), they were combined in the RCRA permit as AOC-T. The location of AOC-T is depicted in Figure F.6.

Land use and habitats at AOC-T are similar to those at SWMUs 122 and 123. Located in an active industrial area of HAFB, AOC-T is primarily covered by concrete or asphalt pavement and is not in use. There are no ecological habitats in or adjacent to the site.

F.6.2 History/Current and Anticipated Future Land Use

Petroleum-contaminated soil removal actions and subsurface characterization were performed by Bhate at AOC-T from June 2004 through June 2008 (NationView, 2011b). Groundwater samples were collected in December 2005/January 2006. Nine VOCs and three semi-volatile organic compounds (SVOCs) were identified as chemicals of potential concern (COPCs), including 1,2-dichloroethane, 2-butanone (MEK), acetone, benzene, isopropyl benzene, methyl methacrylate, n-propyl benzene, sec-butylbenzene, trans-1,3-dichloropropene, 2,4-dimethylphenol, 2-methylnaphthalene, and dibenzofuran (NationView, 2011b).

A risk-based evaluation of groundwater was completed (NationView, 2011b). Based on historical analytical data, benzene and 1,2-dichloroethane exceeded their respective screening levels. A risk assessment performed using data obtained through 2010 determined that the residual concentrations of the COPC in groundwater were protective of future residents (NationView, 2011b). The report was disapproved because monitoring requirements had not been fulfilled, and the risk assessment was deemed inadequate because of the limited monitoring data used for the risk assessment (NMED, 2013). Four semi-annual groundwater monitoring events were required to support evaluation of the groundwater exposure pathways relative to potential vapor impacts at the site (NMED, 2013).

F.6.3 Evaluation of Relevant Information

In April 2017, September 2017, and April 2018, groundwater samples were collected from one temporary and 11 permanent groundwater monitoring wells (AECOM, 2019). For each of the monitoring events, samples underwent analyses for VOCs, SVOCs, and TDS. For the April 2017 and September 2017 events, samples also underwent analysis for ethylene dibromide. Two new groundwater monitoring wells (MW-02&05-11 and MW-02&05-12) were installed in October 2018 (AECOM, 2019). For the October 2018 monitoring event, groundwater samples were collected from the two newly installed wells, in addition to samples collected from the previously existing 12 wells. The new well samples were analyzed for VOCs and ethylene dibromide (AECOM, 2019).

Of the VOCs, only 1,2-dichloroethane exceeded a regulatory standard of 5 µg/L with a maximum concentration of 7.3 µg/L, obtained for the sampled collected from well S1-MW3 during one of the four monitoring events. For the four events, the 1,2-dichloroethane concentration for this well ranged from 4.2 µg/L to 7.3 µg/L (AECOM, 2019). The 1,2-dichloroethane concentrations for samples collected from all the other wells were below the MCL, with most being non-detect. All other VOC concentrations were less than regulatory thresholds.

Three SVOCs identified as COPCs for the AOC-T site, including 2,4-dimethylphenol, 2-methylnaphthalene, and dibenzofuran. Dibenzofuran was occasionally detected in one or two wells with 2,4-dimethylphenol being detected in the samples collected from one well twice. The three SVOC concentrations were below applicable cleanup levels (AECOM, 2019).

Total dissolved solids are present at high concentrations throughout the site, in all cases exceeding the NMWQCC standard in 7 of 12 wells for the potable water threshold (10,000 mg/L). The TDS concentrations for the two new wells also exceeded the 10,000 mg/L threshold for samples collected during the October 2018 monitoring event (AECOM, 2019).

Ethylene dibromide was not detected in any of the samples collected during the two monitoring events conducted in 2017 or during the one sampling event conducted in 2018 (AECOM, 2019).

Both a human health risk assessment and an ecological risk assessment were performed (AECOM, 2019). A human health risk assessment was conducted using current/future on-site industrial/commercial worker, future construction worker, and future resident as potential receptors in accordance with the methods provided in the *2017 NMED Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2017a).

Direct contact with soil (incidental ingestion and dermal contact) and inhalation of particulates and volatiles via air emissions from soil were considered potentially complete exposure pathways for industrial/commercial workers, construction workers, and residential receptors. Petroleum-contaminated soil has been removed from the site and confirmation samples

indicated that soil concentrations were below NMED residential SSLs (AECOM, 2019). A hazard index (HI) and total cancer risk were calculated. The HI is below the NMED target level of 1.0, and the cancer risk is below the target level of 1E-05. Based on the above analysis, soil contamination has been removed to acceptable levels at AOC-T.

Direct contact (ingestion and dermal contact) and inhalation of volatiles in ambient air with groundwater was considered incomplete for the current/future industrial/maintenance worker and the future construction worker (AECOM, 2019). The TDS concentrations in groundwater at the site exceed 10,000 mg/L; thus, a hypothetical future resident is not expected to come into contact with groundwater (i.e., no exposure route) if future residential use of the site occurred. However, groundwater was conservatively evaluated as a potential drinking water source. The maximum detected concentrations of groundwater were compared to the lower of NMWQCC standards or Federal MCLs; the only constituent that exceeded a screening level was 1,2-dichloroethane. The maximum detected concentration of 1,2-dichloroethane at S1-MW3 collected in April 2017 (7.3 µg/L) exceeded its MCL of 5 µg/L. To further evaluate 1,2-dichloroethane, a refined exposure point concentration (EPA) was developed using EPA ProUCL. The refined EPC (95% UCL) for 1,2- dichloroethane in groundwater of 0.727 µg/L is less than the MCL of 5 µg/L (AECOM, 2019). Thus, groundwater concentrations are protective of human health.

The inhalation of VOCs in groundwater via vapor intrusion to indoor air is a potentially complete pathway for the future industrial/commercial worker and the hypothetical future resident. All analytes with groundwater VISLs had a maximum detected concentration that was less than their respective residential and industrial groundwater VISLs (AECOM, 2019). In addition, impacted soil at the site (some of which was the source of impacted groundwater) was removed (AECOM, 2019). The site conditions indicate that a qualitative evaluation for the indoor air exposure pathway is adequate for AOC-T, and that quantitative evaluation of this pathway is not necessary.

A Phase I ecological risk assessment was completed for AOC-T (AECOM, 2019). There are no critical habitats associated with AOC-T, and none of the species evaluated would be potentially exposed to groundwater at AOC-T. The preliminary ecological conceptual site exposure model indicated that all ecological exposure pathways are incomplete at AOC-T, due to the lack of ecological habitat; the site is covered by concrete or asphalt pavement. Based on findings of the scoping assessment, AOC-T does not pose an unacceptable ecological risk. (AECOM, 2019).

F.6.4 Basis for Determination

AOC-T (SS002 and SS005) has been determined to be suitable for Corrective Action Complete without Controls status. The AOC is an inactive site that has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants present do not pose an unacceptable level of risk to human health or ecological receptors under the current or anticipated future land use.

F.7 AOC-UST-889 (TU515), BUILDING 889 UST

F.7.1 Location/Unit Description

AOC-UST-889 (TU515) is the site of a former diesel UST located on the west side of Building 889 - the pump house for HAFB's airfield fire suppression. Historical records indicate that the UST was constructed of bare steel with a capacity of approximately 550 gallons. The location of AOC-UST-889 (TU515) is depicted in Figure F.7.

F.7.2 History/Current and Anticipated Future Land Use

AOC-UST-889 (TU515) is a former UST at Building 889. Building 889 is an unoccupied facility that houses the HAFB airfield fire suppression pumps. High-pressure buried water supply lines are present west and southwest of Building 889. Building 889 is mission critical to the USAF, and any interruption to its service results in immediate cancellation of all flight operations at HAFB. The location of these buried lines to the south of the former UST precludes additional excavation at the site; therefore, it is possible that further investigation at the site may be required upon discontinued use of the building.

Groundwater at AOC-UST-889 is approximately seven feet bgs, and generally flows north to south along a relatively flat gradient. Currently, groundwater at the site is not used for drinking water or irrigation. Although groundwater sampling at AOC-UST-889 did not reveal any wells that contain TDS concentrations higher than the 10,000 mg/L threshold for potable water (ACC, 2011).

There are currently no plans for HAFB to expand operations in the area occupied by site AOC-UST-889 (ACC, 2011). The current and anticipated future land use of AOC-UST-889 (TU515) is classified as industrial (Foster Wheeler, 2002).

F.7.3 Evaluation of Relevant Information

In 2012, approximately 40 cubic yards of soil from AOC-UST-889 were excavated to depths between seven and eight ft bgs as part of a voluntary corrective measure (VCM) (Shaw, 2012). Nineteen soil samples were collected from both direct-push technology boreholes and excavated test pits at varying depths down to the water table at locations surrounding the former UST. The only parameters exceeding NMED SSLs at the time were TPH-gasoline range organics (in one floor sample), and TPH-DRO (in two floor and three wall samples). Elevated TPH in soil was identified to the north, west, and south of the former UST location, and near the foundation on the east side of Building 889 (Shaw, 2013c). Following excavation in 2014 and 2015, soil samples were taken from two soil borings in the former UST excavation area (clean fill area) and 34 borings outside of the former UST excavation area. No soil with contaminant concentrations above residential screening levels was present; therefore, no complete exposure pathway for soil exists at AOC-UST-889.

Three monitoring wells were installed as part of the VCM, with water table depth observed at approximately seven ft bgs (Shaw, 2013b). Groundwater samples were collected from the three monitoring wells and compared to NMWQCC groundwater standards. The only parameter detected above the NMWQCC groundwater standards was manganese in MW-02 (which is down gradient/cross gradient from the site) at a concentration of 0.347 mg/L (Shaw, 2013b). Two additional monitoring wells (MW04 and MW05) were subsequently installed by URS, to better delineate potential impacts at AOC-UST-889 (URS, 2017a).

After analyzing historical data, collecting additional data, and excavating impacted soils, additional corrective measures were conducted at AOC-UST-889 to address groundwater impacted by low level polyaromatic hydrocarbons (PAHs) near TU515-MW05. Application of subsurface injections of PlumeStop-S was the selected remedy, to be followed by semi-annual groundwater monitoring for one year (URS, 2017a).

During the semi-annual groundwater monitoring events in October 2017 and February 2018, five primary and one field duplicate groundwater samples were collected (URS, 2019a). Analytical results were compared to applicable NMWQCC standards and EPA MCLs.

Although benzene, PAHs, and methylene chloride were previously detected above the NMWQCC standards, none were detected above their respective groundwater standards during the October 2017 or February 2018 sampling events (URS, 2019a). No other organic constituents were detected in groundwater at concentrations exceeding the screening levels. HAFB stated that this indicates that the application of PlumeStop-S injections in and around the former UST pit mitigated PAH and VOC impacted groundwater risks within AOC-UST-889 (URS, 2019a).

Several dissolved metal constituents were historically detected above the applicable groundwater standards at AOC-UST-889. In October 2017, four of the five wells (TU515-MW01, -MW02, MW04, and MW05) reported concentrations of manganese that exceeded the NMWQCC standard (0.20 mg/L, NMED 2017a). During the February 2018 sampling event, manganese concentrations had reduced across the site, with only one well (TU515-MW01) reporting an estimated concentration (0.38 mg/L) above the standard (URS, 2019a). Manganese concentrations have exceeded standards in both upgradient and downgradient monitoring wells.

The *Basewide Background Study Report, Holloman AFB* (NationView/Bhate, 2011) identified several areas with elevated naturally-occurring metal concentrations at or above applicable NMWQCC standards or EPA MCLs. Metals results at AOC-UST-889 are generally within the normal range of concentrations identified across HAFB during the 2011 background study (NationView/Bhate, 2011). HAFB concluded that while arsenic and manganese were detected above the applicable groundwater standards, the metals constituents are not directly related to site activities (i.e., a fuel spill) and are likely naturally occurring in the subsurface in this area.

Historically, TU515-MW01 was known to contain elevated concentrations of dissolved arsenic; however, as of the February 2018 sampling event, there are no wells at AOC-UST-889 with dissolved arsenic concentrations above the EPA MCL of 0.01 mg/L (NMED, 2017a). There were no other detections of metal ions that exceeded the respective screening levels in either October 2017 or February 2018 (URS, 2019a).

F.7.4 Basis for Determination

AOC-UST-889 (TU515) has been determined to be suitable for Corrective Action Complete without Controls status. The AOC has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants present do not pose an unacceptable level of risk to human health or ecological receptors under the current or anticipated future land use.

F.8 AOC 823 (SS823) BUILDING 823 TPH IN SOIL

F.8.1 Location/Unit Description

AOC-823 (SS823) is located in the southcentral portion of HAFB, partially on the controlled area of the airfield. The site was identified during an excavation to extend Building 823 in 2014 when petroleum-contaminated soil was discovered during the excavation. The soils excavated for construction were not used as backfill. The location of AOC-823 (SS823) is depicted in Figure F.8.

F.8.2 History/Current and Anticipated Future Land Use

Elevated hydrocarbons were detected in a two-point composite sample (north and south sample points) collected on June 8, 2014, between 0 and 1 ft bgs on the east side of Building 823, beneath where the new building extension is now located (AECOM, 2017). The two-point composite sample contained TPH Diesel at a concentration of 975 mg/kg, TPH Motor Oil concentration of 656 mg/kg and TPH Gasoline concentration of 21.7 mg/kg resulting in a sum of TPH fractions of 1,652.7 mg/kg. No VOCs were detected. SVOCs detected included bis (2-ethylhexyl) phthalate at 6,600 µg/kg and 2- methylnapthalene at 270 µg/kg, which are below the NMED Residential SSLs of 380,000 µg/kg and 231,800 µg/kg, respectively (AECOM, 2017). No other SVOCs were detected above the laboratory reporting limits. Prior to the discovery of contaminated soils, there were no monitoring wells in the vicinity of AOC-823, groundwater impacts were unknown, no potential sources of contamination were identified, and no other data were available for evaluation of site cleanup alternatives (AECOM, 2017).

F.8.3 Evaluation of Relevant Information

Investigation activities were conducted to evaluate whether AOC-823 presents an unacceptable risk to human health or the environment, including groundwater monitoring well installation, soil sampling, and groundwater sampling in April 2017 (AECOM, 2018). Five monitoring wells were installed near Building 823 at the locations shown in Figure F.9 (AECOM, 2018).

Monitoring wells were installed using hollow stem auger drilling techniques. At each monitoring well location, a borehole was advanced below the water table to total depths of 15 to 16 ft bgs.

Soil samples were collected from two depth intervals via split-spoon samplers during the advancement of each of the five well borings at AOC-823 (AECOM, 2018). Due to the absence of high PID field measurements or other indicators of hydrocarbon contamination, one sample was collected from the unsaturated zone directly above the water table (between 7 and 7.5 ft bgs) and another sample collected between this sample and the ground surface (between 3 to 5 ft bgs). Soil samples were collected over a span of one to two feet within the targeted sample interval and analyzed for TPH-GRO, TPH-DRO, and TPH-Oil Range organics, metals, PAHs, VOCs, SVOCs, and pH (AECOM, 2018).

The soil sample analytical results were used to identify potential soil impacts and assess the elevated TPH concentrations identified in the two-point composite sample collected in 2014. Analytical results were compared to the applicable screening levels. The analytical results collected during April 2017 indicate that soil below one-foot bgs at the site is not signifcantly impacted by organic or inorganic compounds. Field PID measurements during drilling were below 4 ppm. No exceedances of residential NMED SSLs were detected for any compounds in soil samples (AECOM, 2018). The highest concentration for TPH detected during the 2017 field activities was 14.8 mg/kg in SS823-SB02 at 3 ft bgs, which is less than the two-point composite sample result of 1,652.7 mg/kg result from 2014 and below the residential SSL (AECOM, 2018).

Following the collection of soil samples, each borehole was completed as a monitoring well as described in the Supplemental RFI Report (AECOM, 2018). The newly installed monitoring wells were developed about a week after installation, with groundwater sample collection occurring after development (AECOM, 2018). Groundwater samples were collected from each well and analyzed for total metals, PAHs, VOCs, SVOCs, and TDS (AECOM, 2018). Groundwater sample analytical results were compared to the appropriate screening levels. The ORP measurements were positive and DO concentrations were generally high, which is consistent with a lack of TPH contamination.

Analytical results for groundwater samples collected at AOC-823 during the April 2017 Supplemental RFI field activities indicate that the groundwater at the site is not impacted by organic or inorganic compounds. None of the applicable regulatory standards were exceeded for any compounds at any of the monitoring wells on the site. Total manganese was detected at a concentration of 0.12 mg/L in the sample collected from SS823-MW01, which is slightly above the NMED background value of 0.05 mg/L (NMED, 2012), but is below the NMWQCC standard for dissolved manganese of 0.2 mg/L (AECOM, 2018). All other analyses were below both background and regulatory screening levels (AECOM, 2018). TDS was detected at concentrations ranging from 3,400 mg/L to 4,200 mg/L, below the NMWQCC threshold of 10,000 mg/L (AECOM, 2018).

A risk assessment for the site was completed (AECOM, 2018). Land use and habitats at AOC-823 are similar to those at SWMUs 122 and 123. AOC-823 is located in an industrial area of HAFB, primarily covered by concrete or asphalt pavement, and there are no ecological habitats in or adjacent to the site. Therefore, the potential human and ecological receptors identified for SWMUs 122 and 123 are also appropriate for AOC-823. Potential human receptors at AOC-823 include current commercial/industrial workers, future residents (adults and children), and future construction workers. An ecological risk assessment was not warranted for AOC-823. The results of soil and groundwater analyses indicate no soil or groundwater exceedances of the applicable screening levels. A risk assessment was conducted for the residential scenario, as it is deemed protective of construction worker and industrial workers. A hazard index (HI) and total cancer risk were calculated. The HI is below the NMED target level of 1.0, and the cancer risk is below the target level of 1E-05; therefore, there are no unacceptable risks to human health or the environment.

F.8.4 Basis for Determination

AOC-823 (SS823) has been determined to be suitable for Corrective Action Complete without Controls status. The AOC has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants present do not pose an unacceptable level of risk to human health or ecological receptors under the current or anticipated future land use.

F.9 AOC-851 (TS851), FORMER SKEET RANGE

F.9.1 Location/Unit Description

AOC-851 (TS851) Former Skeet Range MRS is located in the southeastern portion of HAFB and consists of open desert scrubland. The skeet range was used for small arms training and practice with moving targets, and the firing direction of the range was likely oriented to the northeast (FPM, 2015). Typically, skeet ranges were used for training and/or recreational target shooting. The location of AOC-851 is depicted in Figure F.9.

F.9.2 History/Current and Anticipated Future Land Use

Land associated with AOC-851, Former Skeet Range MRS, was historically used as a skeet range. The site was first identified during the *Final Modified Comprehensive Site Evaluation Phase I Report, Military Munitions Response Program, Holloman Air Force Base, New Mexico, May 2010* (Modified CSE Phase I Report) from a 1972 aerial photograph, and a visual survey revealed lead shot from small arms, clay target debris typical of the time period, and the remains of at least one firing point (FPM, 2015). During the use of the site, lead shot, small arms bullets and debris, and clay targets (containing PAH compounds) were deposited on the surface of the skeet range. PAH compounds are considered the primary range-related contaminant which may have been released directly to the soil during the initial deposition activity or through weathering (FPM, 2015). Concentrations of PAHs were detected above the NMED SSLs during previous sampling activities. There were no explosive safety concerns identified during

previous investigations. Information collected during previous investigations confirmed that associated range-related contamination was limited to the areas within the site boundary with minor adjustments for a small adjacent area nearby also found to have PAH contamination above residential screening levels. PAH contamination has a low mobility and unlikely to migrate beyond site boundaries (USACE, HDR Environmental, Operations and Construction, Inc. [HDR], 2013). Based on the *Comprehensive Site Evaluation Phase II Final Report Military Munitions Response Program, Holloman Air Force Base, New Mexico, September 2013* (CSE Phase II) findings, it was recommended that further action was necessary based on elevated PAH concentrations and visual confirmation of clay target debris.

The current and anticipated future land use of AOC-851 is classified as industrial.

F.9.3 Evaluation of Relevant Information

Information was collected and evaluated relating to the possible presence of munitions related contamination, site physical conditions, and current and anticipated future land use (USACE, ITSI, Shaw, 2010). Information sources included archival records from HAFB, interviews with HAFB personnel, additional archival information collected from public sources, and observations made during visual surveys. This information was reviewed and used to evaluate the potential extent for munitions constituents exposure and the potential for munitions and explosives of concern (MEC), if any, at the site (USACE, ITSI, Shaw, 2010). The findings of the first investigation were documented in the Modified CSE Phase I Report and a second phase of investigation was recommended (USACE, ITSI, Shaw, 2010).

CSE Phase II activities collected and evaluated information relating to the possible presence of MEC, and associated soil contamination from munitions constituents (USACE, HDR, 2013). During the field investigation, visual reconnaissance survey transects were completed within the AOC-851 boundary, and soil samples were collected for on-site X-ray fluorescence analysis for lead and analytical laboratory analysis for PAHs (USACE, HDR, 2013). During the field investigations, clay target debris was identified within 300 ft of the historical firing points. Two firing points were still discernible; however, all other range infrastructure had been removed. Lead shot was also observed within the site boundaries on the surface (USACE, HDR, 2013). The lead shot and clay target debris observed are consistent with historical skeet range use. In addition, pistol caliber bullets of 9mm, .38, and .45 calibers were also documented; these are not typically associated with skeet range activities and were likely deposited from small arms training and activities other than skeet shooting. The total area impacted by clay target debris was approximately 3.1 acres (USACE, HDR, 2013).

An Engineering Evaluation/Cost Analysis was completed for the site in 2015 to evaluate alternatives and associated costs to mitigate the hazards to human health associated with PAH-impacted soils present within the site (FPM, 2015). Based on the CSE Phase II sampling and analysis results, surface and shallow subsurface soils at AOC-851 are impacted by PAH concentrations above the NMED SSLs. Based on a comparative analysis of cost,

implementability, and effectiveness, excavation and offsite disposal was considered the most effective alternative for public health protectiveness (FPM, 2015).

The Non-Time Critical Removal Action (NTCRA) at AOC-851 included surface and shallow subsurface excavation and offsite disposal of PAH-contaminated soils. Soils within the excavation footprint were excavated to approximately 1 ft below ground surface from July 9 through July 20, 2018 (FPM, 2018c). The completed excavation boundary was increased from the proposed boundary to include all adjacent areas where clay target and/or range related debris was identified. A total of 2,564 tons of contaminated soil from the site were transported and disposed of at the South Central Solid Waste Authority Corralitos Regional Landfill in Las Cruces, New Mexico (FPM, 2018c). Post excavation confirmatory end-point soil sampling from the exposed excavation walls and floor was conducted to ensure all residual contamination was removed. The end-point sampling schematic consisted of collecting discrete grab samples on a linear basis from the walls and a grid schematic from the floor. A total of 5 floor and 14 wall end-point soil samples were collected and analyzed for PAHs (FPM, 2018c). Over-excavating in two areas where confirmatory sample results indicated exceedances of the SSLs was conducted on July 19, 2018. Upon completion of the over-excavation, soil samples were again collected from the newly exposed excavation wall extents (samples IDs TS851WS18AB and TS851WS19AB). The analysis of the over-excavation confirmation soil samples indicated that all residual PAH detections throughout AOC-851 (TS851, TS851a) were below their respective NMED residential SSLs (FPM, 2018c). Figure F.11 depicts all sample locations and final excavation extents. Lead shot and bullets were incidentally removed as part of the soil excavation related to SVOCs.

Site restoration included leveling the ground and smoothing the excavated areas by backfilling and compacting laboratory certified clean topsoil to the existing grade and reseeding with native vegetation (FPM, 2018c). The removal activities conducted at the site and the results of the post-excavation confirmation sampling indicate that soil PAH concentrations levels no longer present a risk to human health or the environment.

Potential human receptors include military personnel, authorized non-military personnel, administrative staff, and potential future users through dermal contact, ingestion, and inhalation (dust) of surface soils. A risk assessment was completed for a residential scenario, as it is deemed protective of construction worker and industrial workers (AQS, 2021a). A hazard index (HI) and total cancer risk were calculated. For COPCs where sufficient numbers of detections were present, ProUCL version 5.1 was used to calculate a 95% upper confidence level of the mean (95UCL). If sufficient detects were not available, the median concentration was calculated. Using the revised exposure point concentrations, the resulting cancer risk was 1.17E-05 and the HI is 2.26E-02 (AQS, 2021a). The cancer risk is slightly above the target level of 1E-05. However, none of the COPCs drive risk; there are low levels present. The risks also appear to be driven by results from a few locations, indicating no widespread contamination (AQS, 2021a).

As the site area is small, only two ecological receptors were evaluated: the deer mouse and the horned lark. The results indicate there is no adverse risk to ecological receptors from residual levels of contamination in the soil (AQS, 2021a). Based on the above analysis of human health and ecological risk, contamination has been removed to acceptable levels at AOC-851.

F.9.4 Basis for Determination

AOC-851 has been determined to be suitable for Corrective Action Complete without Controls status. The AOC has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants present do not pose an unacceptable level of risk to human health or ecological receptors under the current or anticipated future land use.

F.10 AOC-859 (TS859) (SR859A), FORMER SKEET RANGE 2

F.10.1 Location/Unit Description

AOC-859, Former Skeet Range 2 MRS, is located in the southeastern portion of HAFB, approximately 1,300 feet north of Forty Niner Avenue and 650 ft north of the Holloman runway control tower within the HAFB restricted airfield. The skeet range was used for small arms training and practice with moving targets. The location of AOC-859 is depicted in Figure F.10.

F.10.2 History/Current and Anticipated Future Land Use

A cultural resource survey documented the presence of shotgun shell cases, clay pigeon debris, .45-caliber automatic pistol cartridges, and a large number of spent cartridges located in three trash piles (USACE, HDR, 2013). Additionally, 1940's historical aerial photos show a four-firing point small arms (skeet) range at this location (USACE, HDR, 2013). Dark areas in contrast to the natural terrain, indicative of clay pigeon debris, are also visible on aerial photography from 1945. It is believed that munitions use was generally limited to 12-, 16-, or 20-gauge shotguns with shells containing lead shot and clay targets historically composed of various PAH compounds. Information collected during previous investigations confirmed that associated range-related contamination was limited to the areas within the site boundary. PAH contamination is not mobile and unlikely to migrate beyond the site boundaries (USACE, HDR, 2013). Based on the CSE Phase II findings, it was recommended that further action was necessary due to elevated PAH concentrations and visual confirmation of clay target debris.

The site is currently open space consisting of desert scrubland and is not expected to change in the future. The current and anticipated future land use of AOC-859 is classified as industrial.

F.10.3 Evaluation of Relevant Information

Information was collected and evaluated relating to the possible presence of munitions related contamination, site physical conditions, and current and future land uses and activities (USACE, ITSI, Shaw, 2010). Information sources included archival records from HAFB, interviews with

HAFB personnel, additional archival information collected from public sources, and observations made during visual surveys. This information was reviewed and used to evaluate the potential for exposure to munitions constituents and the potential for MEC, if any, at the site (USACE, ITSI, Shaw, 2010). The findings of the first investigation were documented in the Modified CSE Phase I Report and a second phase of investigation was recommended (USACE, ITSI, Shaw, 2010).

The Phase II activities collected and evaluated information relating to the possible presence of munitions and explosives of concern and associated soil contamination from munitions constituents. Clay target debris was observed along with spent 12-gauge shotgun shells/casings and components (i.e. lead shot, plastic wadding, etc.); 5.56mm, 7.62mm, and .50-caliber casings were also observed during the CSE Phase II visual reconnaissance survey. The lead shot and clay target debris that were observed are consistent with historical skeet range usage. The 5.56mm, 7.62mm, and .50-caliber casings that were also documented are not typically associated with skeet range activities and were likely deposited from the use of small arms during training (USACE, HDR, 2013). During the field investigation, visual reconnaissance survey transects were completed within the AOC-859 boundary, and soil samples were collected for on-site X-ray fluorescence analysis for lead and analytical laboratory analysis for PAHs (USACE, HDR, 2013). A total of 140 surface soil samples were collected and screened for lead using the X-ray fluorescence analyzer. Lead analysis results ranged from below the instrument's limit of detection (12 mg/kg) to 463 mg/kg. Only one surface sample exceeded the EPA residential screening level of 400 mg/kg. Twenty surface and four subsurface soil samples were collected and analyzed for PAHs. Results from that analysis indicated that at least one analyte exceeded the associated PAH human health SSL in 6 of the 24 samples collected (USACE, HDR, 2013). The site was recommended for further munitions response action due to the presence of PAH concentrations in soil that pose potential risk to human health and the environment (USACE, HDR, 2013).

A Remedial Investigation was completed at AOC-859 in 2016 to evaluate the nature and extent of residual contamination previously identified in soils related to past range related activities, identify potential risks to human health and the environment, and determine whether remedial actions were necessary (FPM, 2018a). Activities included the collection of soil samples for laboratory analysis of PAHs and select munitions-related metals (arsenic, antimony, copper, lead, and zinc). The results were combined with the existing CSE Phase II data and used to identify and delineate the residual metals and PAHs in soil and assess risk. All analytical results for metals were below HAFB background soil concentration values. Soil sample analytical data indicated that lead concentrations did not exceed the NMED SSL. Analytical results from 18 of the 20 samples collected did not indicate any detection of PAHs. Furthermore, no PAH compound was detected in samples at a concentration exceeding the respective NMED SSL from samples collected during the investigation (FPM, 2018a).

An Engineering Evaluation/Cost Analysis was completed for the site in 2018 (FPM, 2018b) to evaluate alternatives and associated costs to mitigate the hazards to human health associated with lead and PAH-impacted soils present within the site. Based on previous sampling and

analysis results, surface and shallow subsurface soils at AOC-859 had lead and PAH concentrations above the NMED SSLs. Based on a comparative analysis of cost, implementability, and effectiveness, excavation and offsite disposal was considered the most effective alternative for protection of public health (FPM, 2018b).

The NTCRA at AOC-859 included surface and shallow subsurface excavation and offsite disposal of lead and PAH-contaminated soils (FPM, 2019b). Soils within the excavation footprint were excavated from the surface to approximately one foot bgs from April 29, 2019 through May 23, 2019 (FPM, 2019). A total of 3,825 tons of contaminated soil from the site were transported and disposed of at the South Central Solid Waste Authority Corralitos Solid Waste Regional Landfill in Las Cruces, New Mexico (FPM, 2019b). Confirmatory end-point soil sampling from the exposed excavation walls and floor was conducted to ensure all residual contamination was removed. A total of 25 floor [including one over-excavation resample] and 28 wall (53 total samples) end-point soil samples were collected and analyzed for PAHs; one excavation floor sample and four excavation wall samples which were additionally sampled for lead. The locations of the samples and the excavation boundary are depicted in Figure F.10. The initial floor sample from location FS18 indicated PAH concentrations at levels exceeding NMED Residential SSLs. An area approximately 100 ft by 100 ft was marked out and centered around that location, the area was over-excavated to a depth of approximately one foot bgs, and an additional confirmatory endpoint sample was collected (FS18R) (FPM, 2019b).

The analysis of all end-point confirmation soil samples indicated that all residual lead and PAH concentrations throughout AOC-859 were below their respective NMED Residential SSLs (FPM, 2019b). The removal activities conducted at the site and the results of the post-excavation confirmation sampling indicate that soil lead and PAH concentration levels no longer present a risk to human health or the environment. Based on confirmatory sampling results, the site was restored and seeded with native vegetation.

A risk assessment was conducted for the residential scenario, as it is deemed protective of construction worker and industrial workers. A hazard index (HI) and total cancer risk were calculated. The HI is below the NMED target level of 1.0 (AQS, 2021b). For COPCs where sufficient numbers of detections were present, ProUCL version 5.1 was used to calculate a 95% upper confidence level of the mean (95UCL). If sufficient detects were not available, the median concentration was calculated. Using the revised exposure point concentrations, the resulting cancer risk is 8.32E-06, which is below the target level of 1E-05 (AQS, 2021b).

As the site area is small, only two ecological receptors were evaluated: the deer mouse and the horned lark. The results indicate there is no adverse risk to ecological receptors from residual levels of contamination in the soil (AQS, 2021b). Based on the above analysis of human health and ecological risk, contamination has been removed to acceptable levels at AOC-859.

F.10.4 Basis for Determination

AOC-859 (TS859) has been determined to be suitable for Corrective Action Complete without Controls status. The AOC has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants present do not pose an unacceptable level of risk to human health or ecological receptors under the current or anticipated future land use.

F.11 AOC-862 (TS862) (TS862A), JEEP TARGET AREA SKEET RANGE

F.11.1 Location/Unit Description

AOC-862, Jeep Target Area Skeet Range MRS, is located in the southeastern portion of HAFB, just north of the Jeep Target Area. The skeet range was used for small arms training and practice with moving targets. Skeet ranges were used for training and/or recreational target shooting. The location of AOC-862 (TS862) is depicted in Figure F.11.

F.11.2 History/Current and Anticipated Future Land Use

The skeet range is visible in a historical USACE aerial photograph from 1972 (USACE, ITSI, Shaw, 2010). The skeet range was used for small arms training and practice with moving targets, and the firing direction of the range appeared to be oriented to the northeast. Information collected during previous investigations confirmed that associated range-related contamination was limited to the areas within the site boundary with minor adjustments for a small adjacent area nearby also found to have PAH contamination above residential screening levels. PAH contamination is unlikely to migrate beyond site boundaries due to its low mobility (USACE, HDR, 2013). Based on the CSE Phase II findings, it was recommended that further action was necessary due to elevated PAH concentrations and visual confirmation of clay target debris.

The site is currently open space consisting of desert scrubland and is not expected to change in the future. The current and anticipated future land use of AOC-862 is classified as industrial.

F.11.3 Evaluation of Relevant Information

Information was collected and evaluated relating to the possible presence of munitions related contamination, site physical conditions, and current and future land uses and activities. Information sources included archival records from HAFB, interviews with HAFB personnel, additional archival information collected from public sources, and observations made during the visual surveys. This information was reviewed and used to evaluate the potential for exposure to munitions constituents and the potential for MEC, if any, at the site (USACE, ITSI, Shaw, 2010). Based on the Phase I findings, a CSE Phase II was recommended (USACE, ITSI, Shaw, 2010).

During the CSE Phase II, information on the possible presence of munitions and explosives of concern and associated soil contamination from munitions constituents was collected and

evaluated (USACE, HDR, 2013). Clay target debris was identified along with spent 12-gauge shotgun shells/casings and components (i.e. lead shot, plastic wadding, etc.); .45-caliber, and .50-caliber spent casings were also observed during the CSE Phase II visual reconnaissance survey (USACE, HDR, 2013). The lead shot and clay target debris that were observed are consistent with historical skeet range use. In addition, pistol caliber bullets of 9mm, .38, and .45 calibers were also documented that are not typically associated with skeet range activities and were likely deposited from small arms training and activities other than skeet shooting. During the field investigation, visual reconnaissance survey transects were completed within the AOC-862 boundary, and soil samples were collected for on-site X-ray fluorescence analysis for lead and analytical laboratory analysis for PAHs (USACE, HDR, 2013). No X-ray fluorescence lead samples exceeded the EPA residential screening level of 400 mg/kg. Results from the analytical laboratory PAH analysis indicated that concentrations exceeded the associated EPA residential screening levels for at least one analyte in 8 of the 41 soil samples. The site was recommended for further munitions response action due to PAH concentrations in soil that pose potential risk to human health and the environment at the conclusion of the CSE Phase II (USACE, HDR, 2013).

A Remedial Investigation was completed at AOC-862 in 2016 to evaluate the nature and extent of residual contamination previously identified in soils related to past range related activities, identify potential risks to human health and the environment, and determine whether remedial actions were necessary (FPM, 2018a). Activities included the collection of soil samples for analytical laboratory analysis of PAHs and select munitions-related metals (arsenic, antimony, copper, lead, and zinc). The results were combined with the existing CSE Phase II data and used to identify and/or delineate the residual metals and PAHs in soil and assess risk. All analytical results for metals were below the HAFB background soil concentration values. No PAH concentrations exceeded their respective screening levels. Based on the compiled soil results from previous investigations and the analysis of the human health risk assessment, which indicated that identified concentrations of PAHs in samples collected during the CSE Phase II pose a risk to potential future receptors under a residential use scenario, further action was recommended to address identified contamination present in site soils (FPM, 2018a).

An Engineering Evaluation/Cost Analysis was completed for the site in 2018 (FPM, 2018b) to evaluate alternatives and associated costs to mitigate the hazards to human health associated with PAH-impacted soils present within the site. Based on previous sampling and analysis results, surface and shallow subsurface soils at the site contained PAH concentrations above the NMED SSLs. Based on a comparative analysis of cost, implementability, and effectiveness, excavation and offsite disposal was considered the most effective alternative to protect public health (FPM, 2018b).

The NTCRA at AOC-862 included surface and shallow subsurface excavation and offsite disposal of PAH-contaminated soils. Soils within the excavation footprint were excavated from the surface to approximately 1 ft below ground surface from December 17, 2018 through January 3, 2019 (FPM, 2019a). A total of 3,913 tons of contaminated soil from the site were transported and disposed of at the South Central Solid Waste Authority Corralitos Solid Waste

Regional Landfill in Las Cruces, New Mexico (FPM, 2019a). Confirmatory endpoint soil sampling from the exposed excavation walls and floor was conducted to ensure all residual contamination was removed. A total of 12 floor and 25 wall end-point soil samples were collected and analyzed for PAHs (FPM, 2019a). The locations of the samples and the excavation boundary are depicted in Figure F.11.

The analysis of all end-point confirmation soil samples indicated that residual PAH detections throughout AOC-862 were all below their respective residential SSLs (FPM, 2019a). Lead shot was also removed as part of the remedial soil excavations. Based on confirmatory sampling results the site was restored with clean backfill and seeded with native vegetation (FPM, 2019a).

A risk assessment was conducted for the residential scenario, as it is deemed protective of construction worker and industrial workers. A hazard index (HI) and total cancer risk were calculated. The HI is 1.232E-02, which is below the NMED target level of 1.0 (AQS, 2021c). The cancer risk is 7.34E-06, which is below the target level of 1E-05 (AQS, 2021c).

As the site area is small, only two ecological receptors were evaluated: the deer mouse and the horned lark. The results indicate there is no adverse risk to ecological receptors from residual levels of contamination in the soil (AQS, 2021c). Based on the above analysis of human health and ecological risk, contamination has been removed to acceptable levels at AOC-862.

F.11.4 Basis for Determination

AOC-862 (TS862) has been determined to be suitable for Corrective Action Complete without Controls status. The AOC has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants present do not pose an unacceptable level of risk to human health or ecological receptors under the current or anticipated future land use.

F.12 AOC-1194 (TU904), BUILDING 1194 SEPTIC SYSTEM

F.12.1 Location/Unit Description

AOC-1194 (TU904) septic system is located west of Building 889. The land surrounding AOC-1194 is zoned for industrial use and is primarily vacant. The nearest occupied building to AOC-1194 is the Primate Research Center that is located approximately 0.65 mile east and upgradient (north northeast) of AOC-1194. Building 1194, which has historically been used for industrial purposes, remains in place. However, it has been unoccupied since approximately 1998, and neither HAFB nor the USAFcurrently have plans to modify, renovate, or use Building 1194 (URS, 2014). The location of AOC-1194 is depicted in Figure F.12.

F.12.2 History/Current and Anticipated Future Land Use

Historical records report that the septic tank at AOC-1194 was a concrete tank with a capacity of 1,350 gallons and indicate that the septic tank was decommissioned by crushing and abandonment in place in 2008 (North Wind Inc. 2008; Shaw, 2013a; USACE 2009). The tank had been in service for 21 years and was unused approximately 10 years prior to closure (Shaw, 2013a; USACE 2009). It was closed by removal of its contents, crushing, and backfilling (North Wind Inc. 2008). No environmental sampling was performed during tank decommissioning in 2008.

Shaw performed a RFI and VCM in 2012. Twenty-two soil borings were collected and twelve groundwater monitoring wells (TU904-MW01 through TU904--MW12) were installed. The only chemicals exceeding the soil screening values were benzo(a)pyrene in one shallow subsurface sample and arsenic in one deeper subsurface sample. No other exceedances of the applicable soil screening levels were identified (Shaw, 2013a, 2013b). The only detected constituents exceeding the groundwater screening levels were antimony in one well, iron in two wells, and TCE in five wells.

The current and anticipated future land use of AOC-1194 is classified as industrial. Future land use is not expected to differ significantly from current land use (Foster Wheeler, 2002). There are currently no plans for HAFB to expand operations in the area occupied by the site.

F.12.3 Evaluation of Relevant Information

In October 2014, soil sampling results and visual, olfactory, and PID observations from soil borings were utilized to delineate the extent of soil contamination at AOC-1194 (URS, 2016). Two parameters exceeded soil screening values during the 2012 combined RFI/VCM; benzo(a)pyrene in one shallow subsurface sample and arsenic in one deeper subsurface sample (Shaw, 2013a, 2013b). A 10-ft long by 10-ft wide by 5-ft deep area surrounding TU904-MW01 was excavated using a mini-excavator in October 2014 to remove soil in the area of the isolated benzo(a)pyrene exceedance (Shaw, 2013b). Excavated soils were transferred from the subsurface directly into a roll-off container and staged on site. Excavation sidewall and floor samples were collected for confirmation purposes (URS, 2016).

Analytical results for soil samples collected at AOC-1194 from the excavation and soil borings indicate that soil at the site is not impacted by releases of organic or inorganic compounds. Only nickel was detected at one location (TU904-EX01-03 at 4 ft bgs) at a concentration of 140 mg/kg, above the respective background level at HAFB, but below the residential SSL of 1,560 mg/kg (NMED, 2015).

In 2014 and 2015, nine monitoring wells (TU904-MW13 through TU904-MW21) were installed to provide additional delineation of the TCE plume boundaries and confirm hydraulic flow and gradient interpretations (URS, 2016). The new wells were installed in upgradient,

downgradient, and cross-gradient locations relative to the anticipated source areas (URS, 2016).

TCE was detected in multiple AOC-1194 monitoring wells in sampling events from 2014-2018 with results exceeding the respective cleanup levels. Analytical data indicate that TCE concentrations at AOC-1194 have generally decreased or remained stable between 2012 and 2018, with slight fluctuations. Concentrations of TCE are generally low at AOC-1194. The highest TCE concentration detected to date is 22 µg/L (TU904-MW13 in September 2018). This well has shown slight increases in TCE concentration over time; however, the range since 2014 is 15-22 µg/L suggesting generally stable concentrations since there are decreasing or stable trends at all other site wells. Other than TCE, no other groundwater cleanup standards were historically exceeded for organic constituents.

In 2015, nitrate and several metals were also detected above their applicable groundwater standards (URS, 2016). Nitrate exceedances of the MCL fall within the 95% UTL identified in the 2014 Nitrate Characterization Study (NationView, 2014). Several metals were detected above their applicable groundwater standards at AOC-1194. During the November 2015 groundwater sampling event, 5 of 18 wells sampled contained concentrations of one or more metal ions that exceeded the applicable standard. These five monitoring wells are located on the upgradient (east) side of the site. There were no exceedances of applicable cleanup standards for metals in groundwater on the downgradient (west) side of the site in November 2015 (URS, 2016).

In March 2017, nine soil vapor sampling points were installed at AOC-1194 (URS, 2017b). No soil vapor samples exceeded the applicable soil gas standard for any of the VOCs analyzed. TCE was detected in each sample during each sampling event from 2017-2018; however, all TCE values were below the residential soil-gas screening level of 69.5 µg/m^3 (URS, 2017b). Chloroform, naphthalene, and EDB have been inconsistently detected in soil vapor above residential VISLs at various times and locations during the IM activities at AOC-1194. The detections are not site-wide or concentrated in a particular area. The constituents have been detected inconsistently, are not present in groundwater, and are not considered to be constituents of concern at AOC-1194 (URS, 2017b).

The source area for benzo(a)pyrene in soil has been removed by excavation, which has been confirmed by laboratory chemical analysis (URS, 2016). The single arsenic exceedance in a soil sample collected in 2012 from 10 to 12 ft bgs is below the soil depth interval considered for evaluation for the relevant receptors (0 to 10 ft bgs) (URS, 2016).

Groundwater in five of the 17 monitoring wells sampled at AOC-1194 have TDS concentrations above 10,000 mg/L (URS, 2016). TDS concentrations are generally elevated in this area; in February 2018, the average TDS concentration of the 17 wells sampled was 9,394 mg/L, with minimum and maximum concentrations of 4,700 to 14,000 mg/L, respectively. Groundwater at the site is not a drinking water source.

Based on historical and current data, the TCE plume at AOC-1194 has been delineated and is stable to attenuating (URS, 2017b). Of the 17 monitoring wells sampled routinely at AOC-1194

between 2012 and 2018, TCE concentrations are decreasing or generally stable at all wells. The stable shape and size of the TCE plume measured over several years indicate that historical sources of TCE at the site are likely no longer contributing significantly to the dissolved-phase plume, regardless of the exact location of the original release between Building 1194 and the former septic tank (URS, 2017b). An emerging contaminant of concern,1,4-dioxane, was not detected in groundwater samples obtained from the site.

Historical exceedances of screening levels for various metals are likely due to the use of bailers stirring up significant amounts of sediment during sampling. Sampling procedures were modified to use pneumatic bladder pumps in early 2017, and no metal exceedances have been detected at sampled wells in the three sampling events since the use of bailers was discontinued (URS, 2019c).

Based on a quantitative risk assessment for soil-gas, soil-gas from TCE in groundwater at the site does not present an unacceptable risk to human health or the environment. Exceedances of the industrial and residential VISLs for naphthalene were detected in two vapor wells during March 2018. This appears to be an anomaly, as naphthalene was detected at concentrations below the residential VISL both prior to this event in 2017 and after the event in September 2018. Naphthalene is not a groundwater COC at AOC-1194 and was not detected in groundwater prior to the March 2018 sampling even. No exceedances were detected during the September 2018 sampling event.

Soil vapor constituents, chloroform, naphthalene, and EDB have been inconsistently detected above their respective VISLs at various times and locations during the interim measures activities at AOC-1194 (URS, 2019c). Due to these inconsistent detections, calculations from the vapor intrusion risk evaluation described in this report indicate that there may be potential residential vapor intrusion cancer risk, but no industrial cancer risk. The cumulative cancer risk slightly exceeds the $1x10^{-5}$ threshold, driven primarily by chloroform. Chloroform is likely not related to a continued source of soil or groundwater contamination present at the site and has been found erratically and inconsistently at AOC-1194. Thus, there is no complete pathway for residential risk from vapor intrusion.

F.12.4 Basis for Determination

AOC-1194 has been determined to be suitable for Corrective Action Complete with Controls status due to the presence of TCE in groundwater at concentrations greater than the applicable cleanup standards. The AOC has been characterized in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants present do not pose an unacceptable level of risk to human health or ecological receptors under the current or anticipated future land use.

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FIGURES

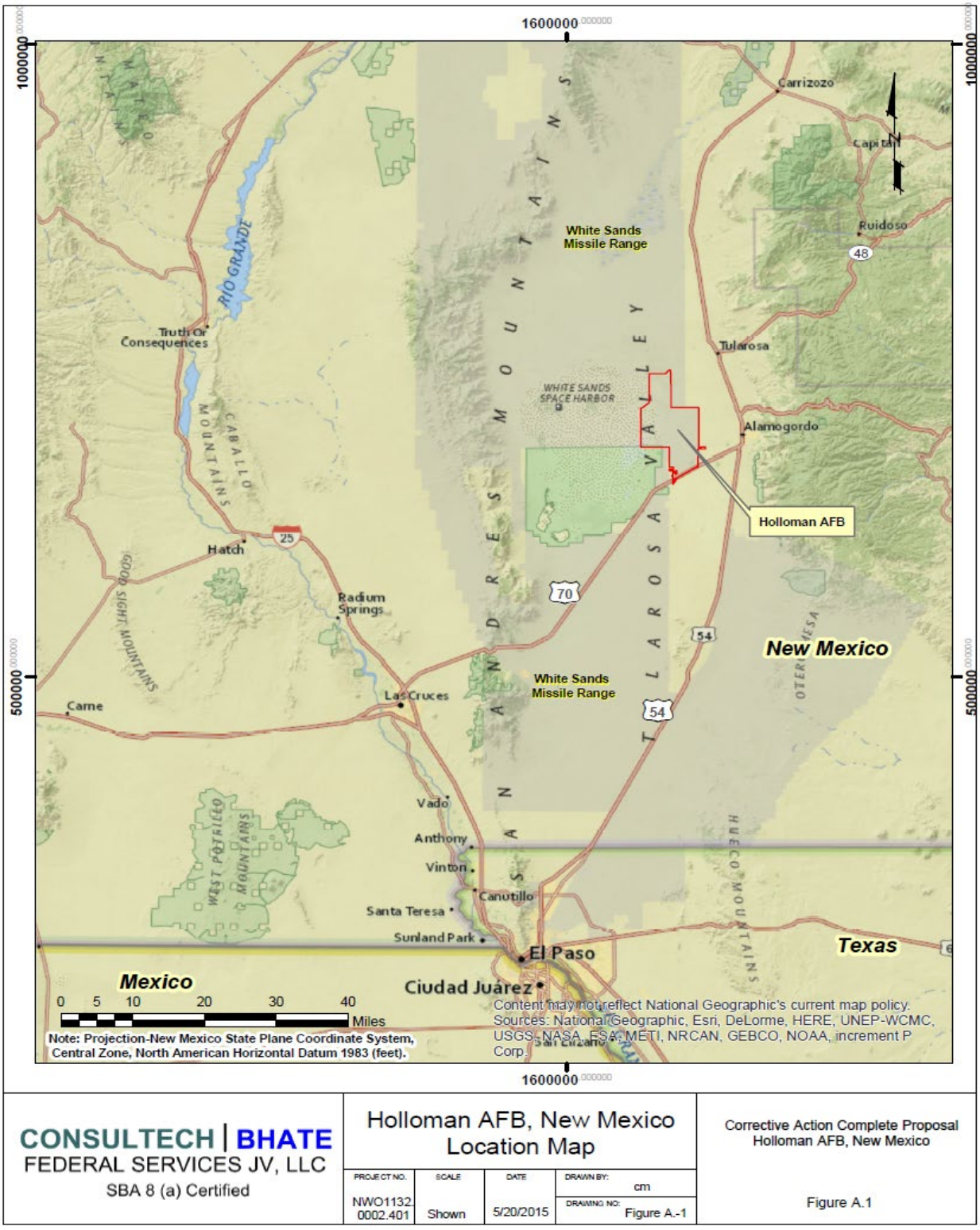


Figure A.1 Facility Location Map, Holloman Air Force Base (URS, 2020).

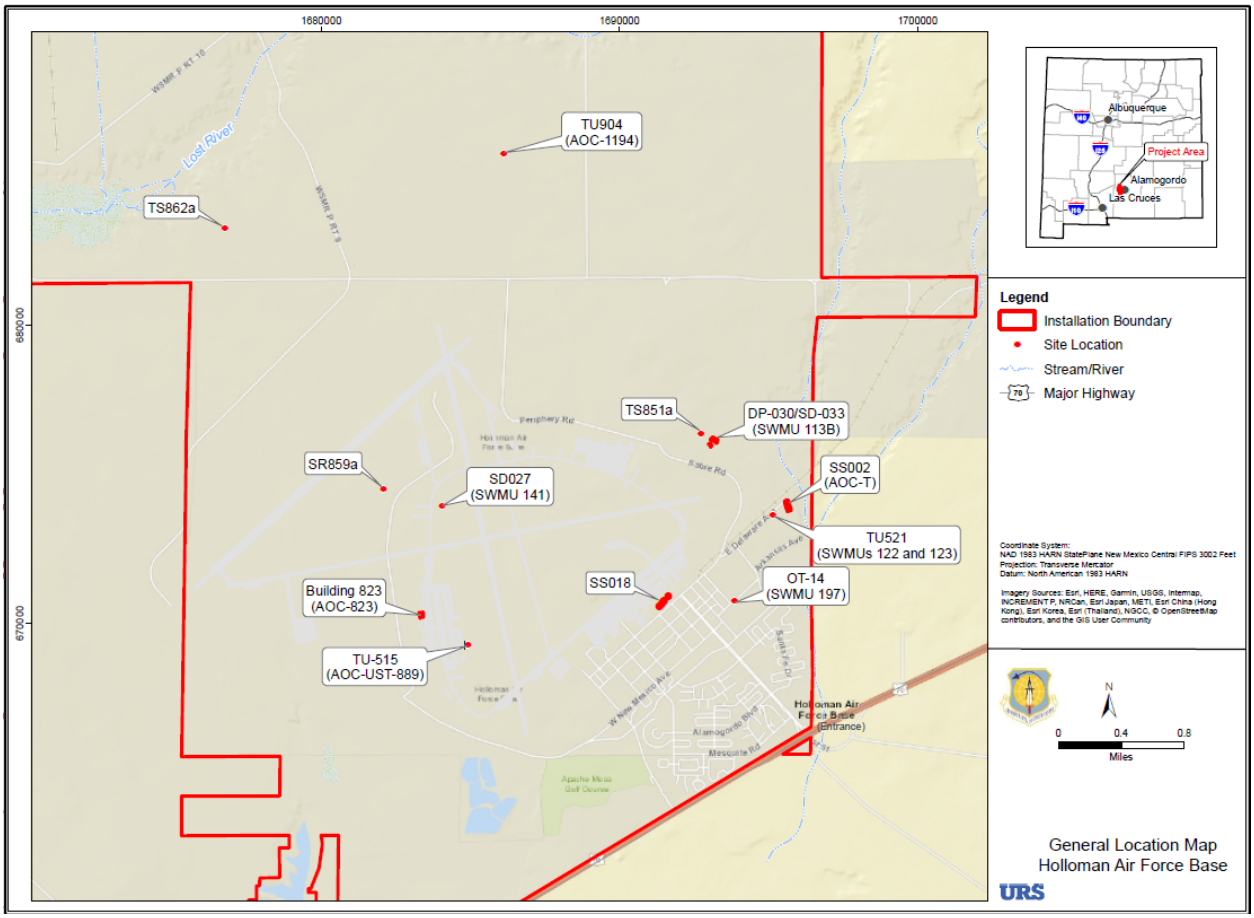


Figure B.1 SWMUs and AOCs General Location Map (URS, 2020).

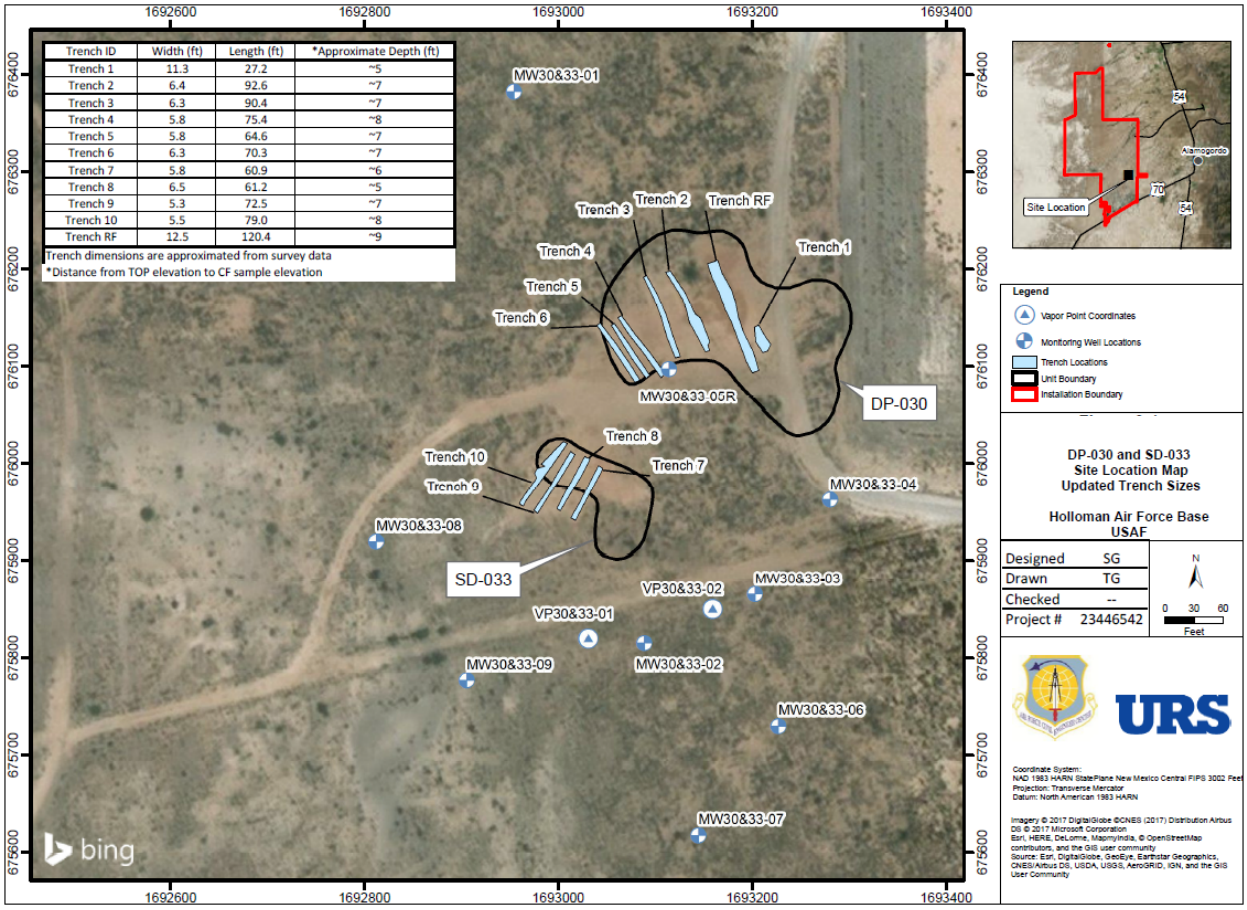


Figure F1.1 SWMU 113B Soil Excavations Between 2015 and 2016 (URS, 2018a).

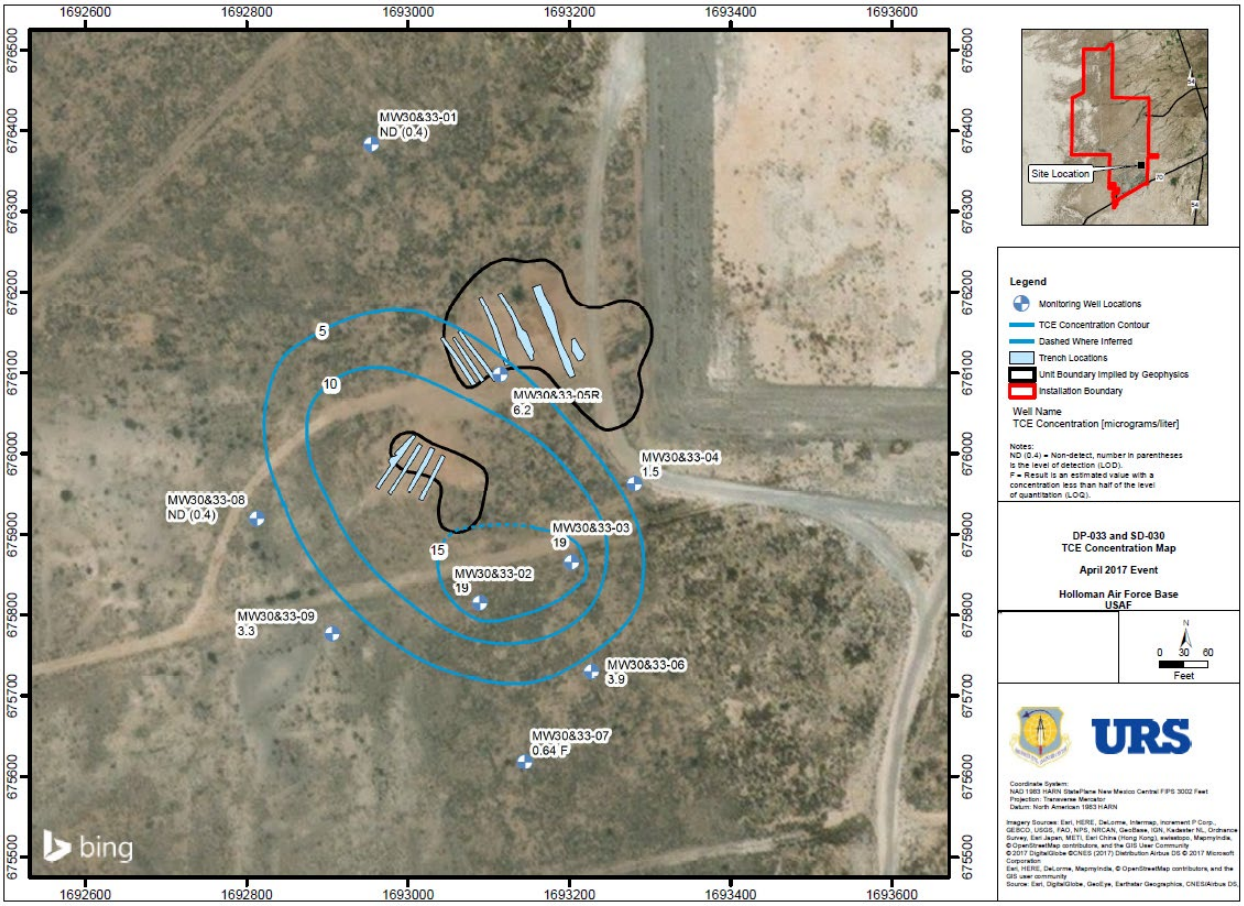


Figure F1.2 SWMU 113B Groundwater Monitoring Wells (URS, 2018a).

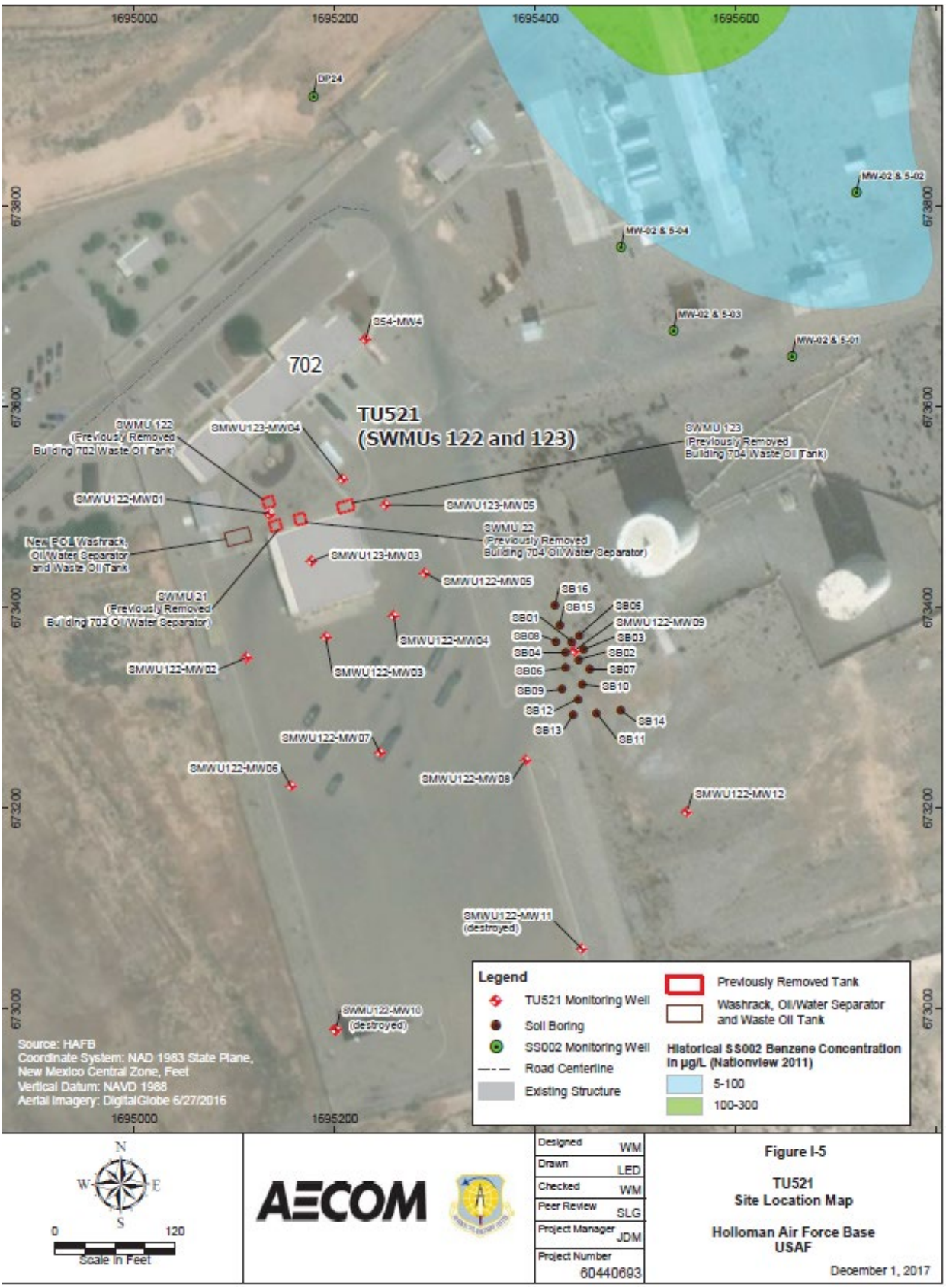


Figure F.2 SWMU 122 and 123 Site Location Map (AECOM, 2018).

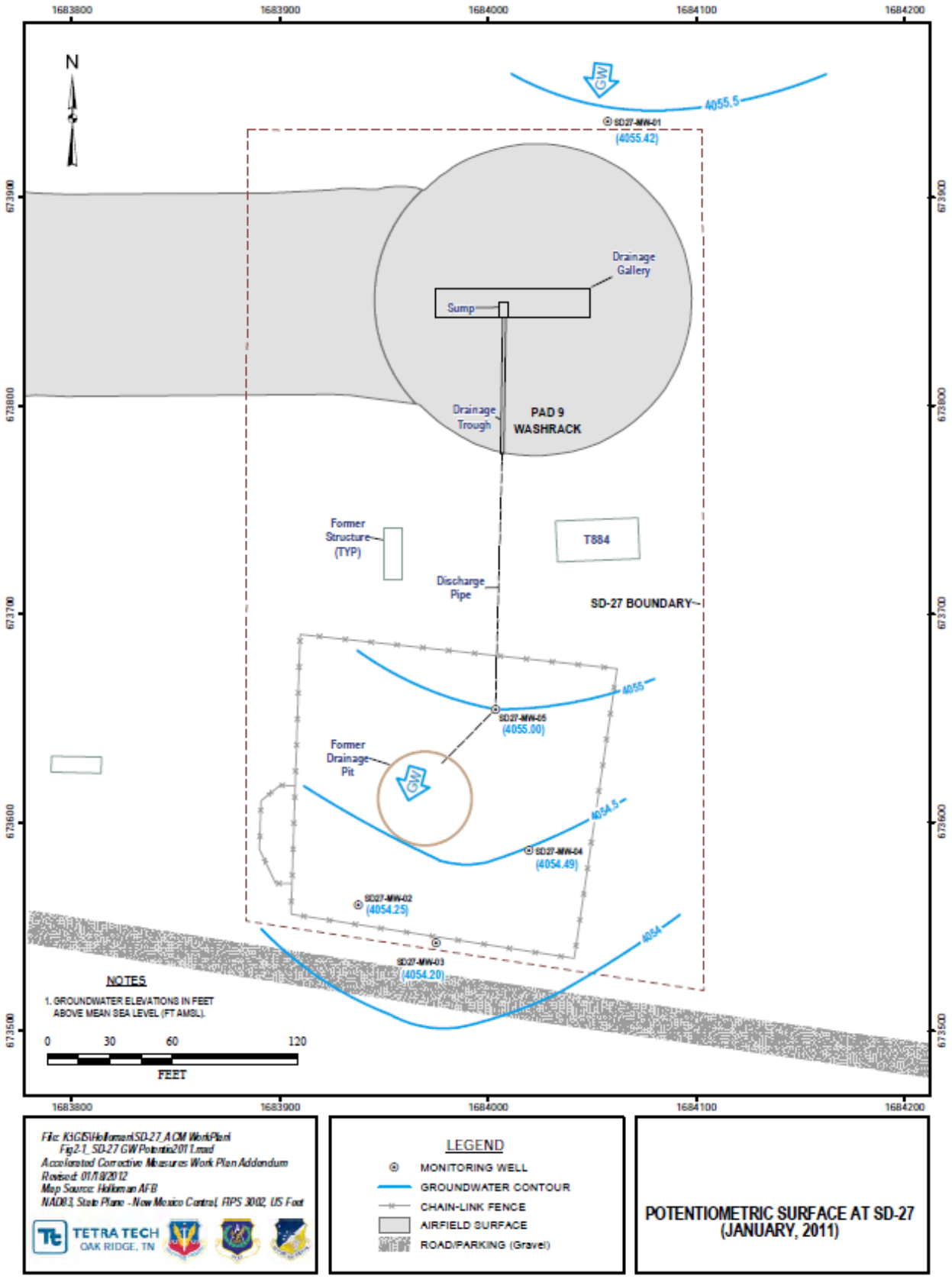


Figure F.3 SWMU 141 (SD027) Site Location Map (Tetra Tech, 2012).

Figure F.4 SWMU 197 (OD014) Site Location Map (Bhate, 2012).

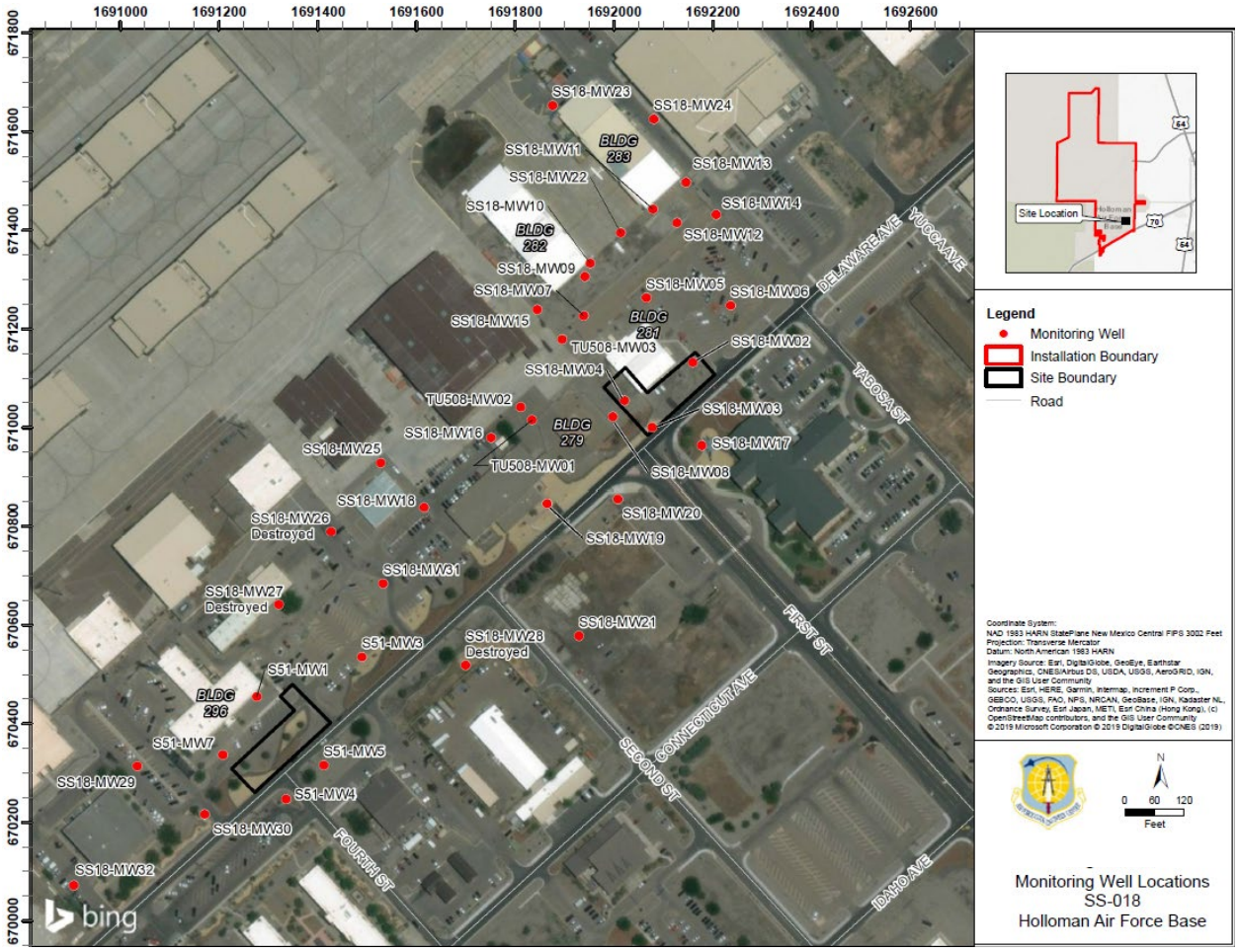


Figure F.5 AOC-H (SS-018) Location Map (URS, 2018d).

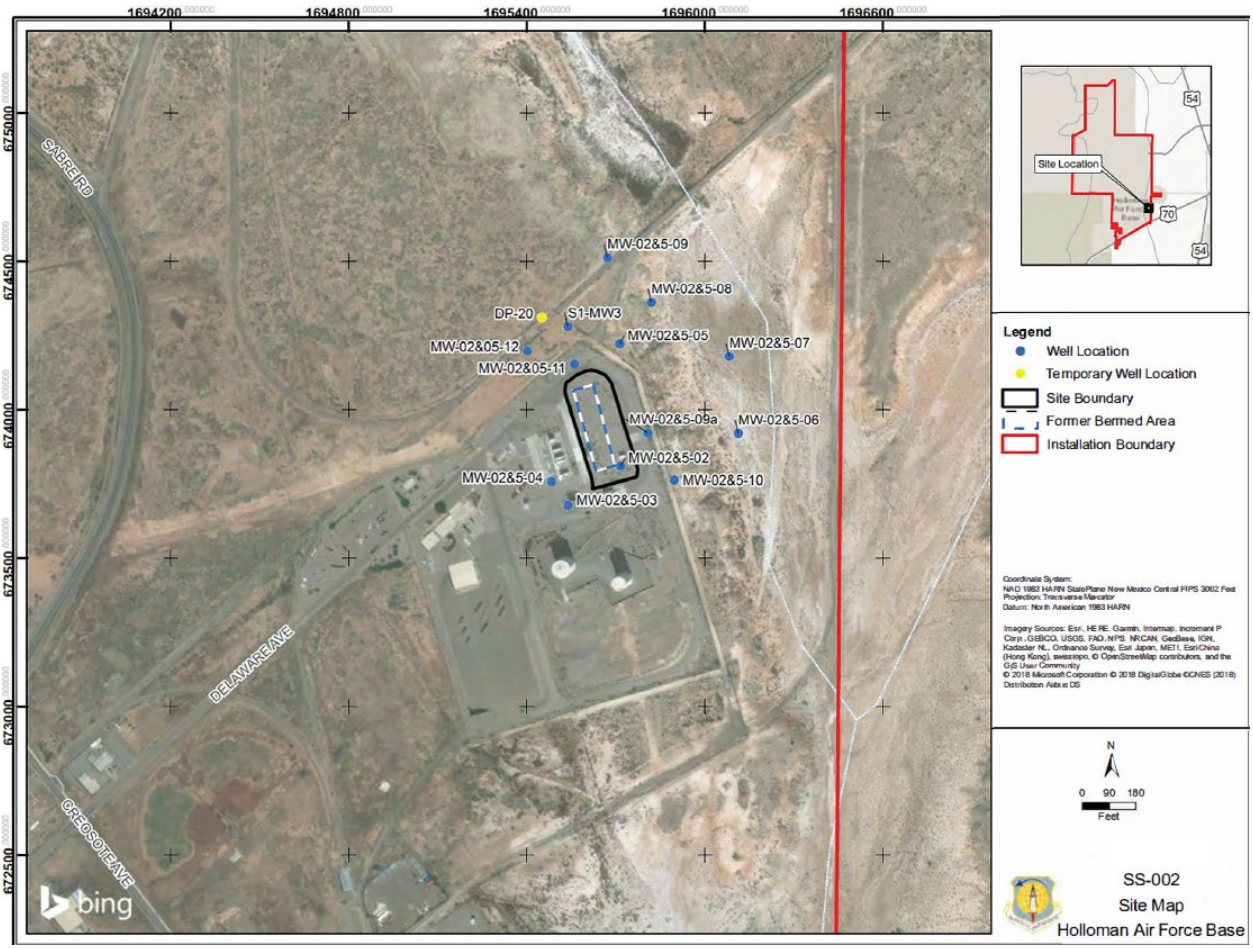


Figure F.6 AOC-T (SS-002) Location Map (AECOM, 2019).

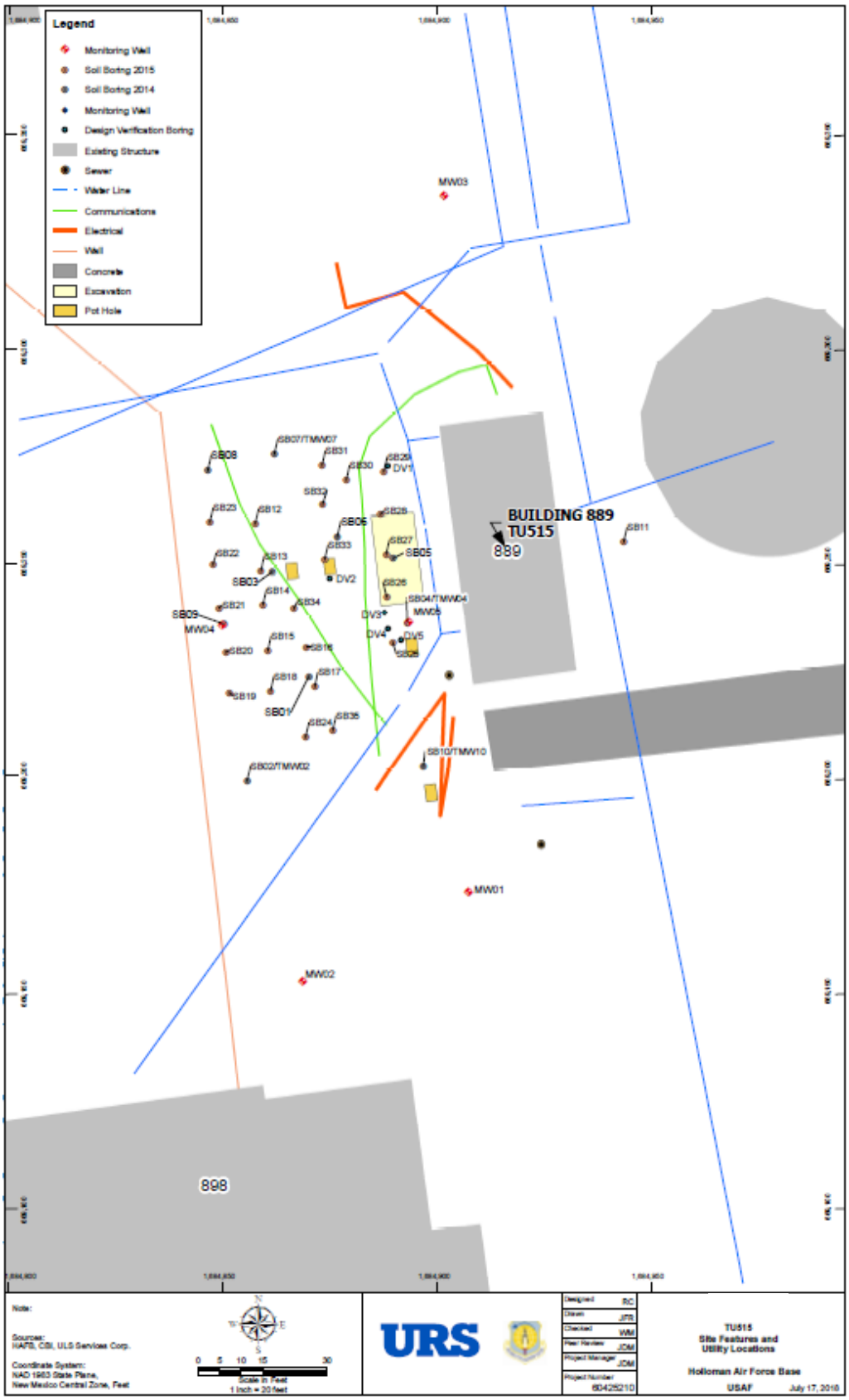


Figure F.7 AOC-UST-889 (TU515) Location Map (URS, 2019a).

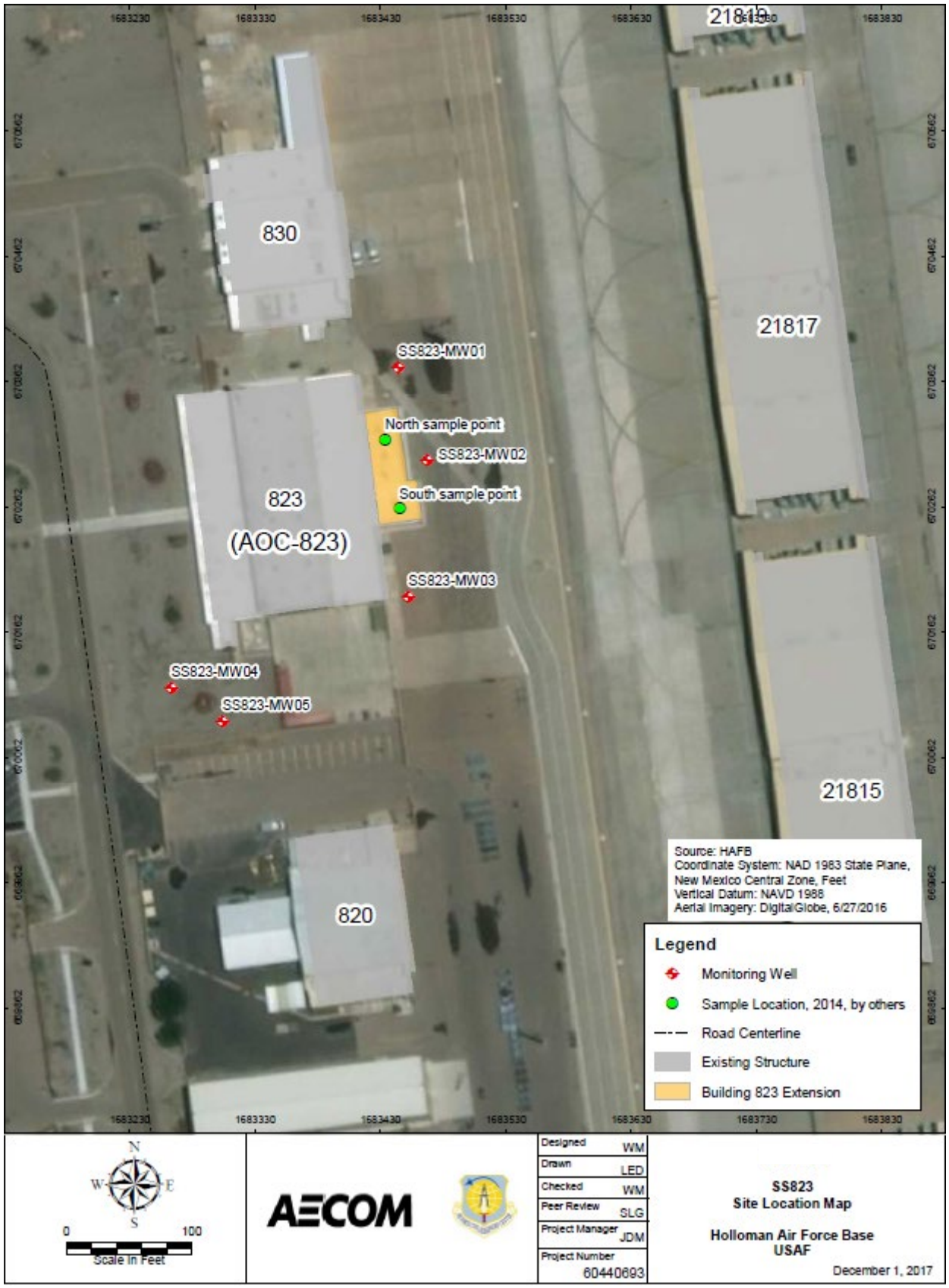
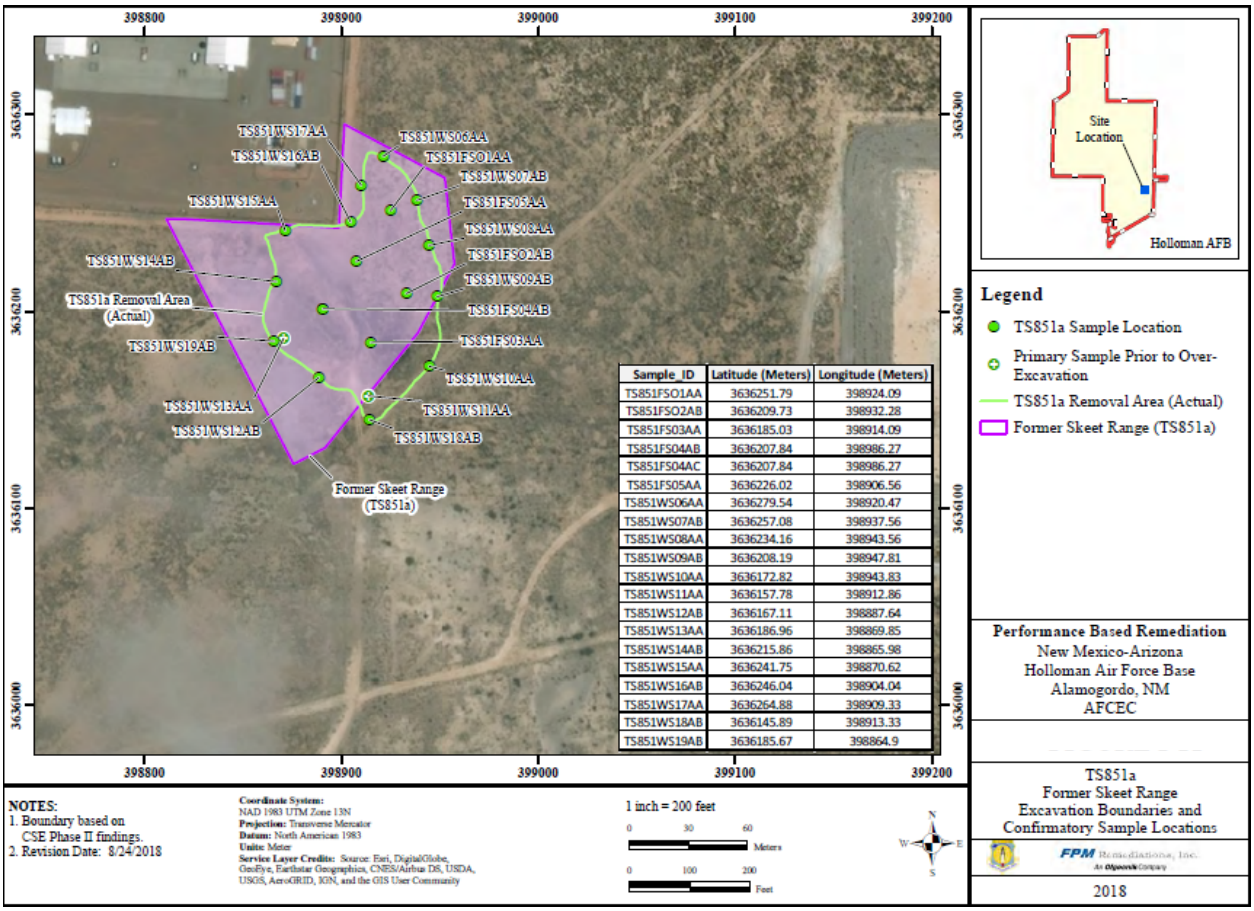


Figure F.8 AOC-823 (SS823) Location Map (AECOM, 2018).



Sample_ID	Latitude (Meters)	Longitude (Meters)
TS851FSO1AA	3636251.79	398924.09
TS851FSO2AB	3636209.73	398932.28
TS851FS03AA	3636185.03	398914.09
TS851FS04AB	3636207.84	398986.27
TS851FS04AC	3636207.84	398986.27
TS851FS05AA	3636226.02	398906.56
TS851WS06AA	3636279.54	398920.47
TS851WS07AB	3636257.08	398937.56
TS851WS08AA	3636234.16	398943.56
TS851WS09AB	3636208.19	398947.81
TS851WS10AA	3636172.82	398943.83
TS851WS11AA	3636157.78	398912.86
TS851WS12AB	3636167.11	398887.64
TS851WS13AA	3636186.96	398869.85
TS851WS14AB	3636215.86	398865.98
TS851WS15AA	3636241.75	398870.62
TS851WS16AB	3636246.04	398904.04
TS851WS17AA	3636264.88	398909.33
TS851WS18AB	3636145.89	398913.33
TS851WS19AB	3636185.67	398864.9

Figure F.9 AOC-851 (TS851) Location Map (FPM, 2018c).

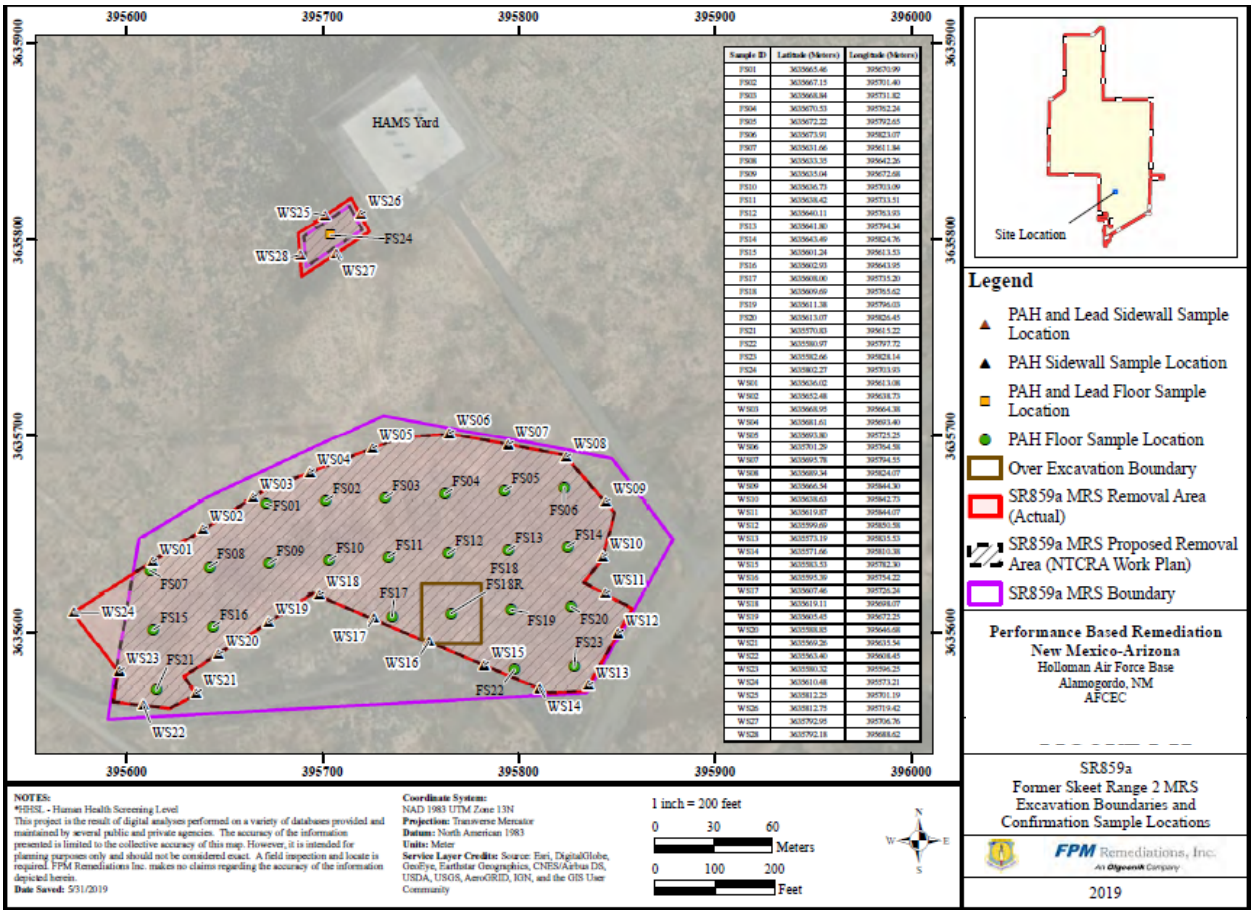
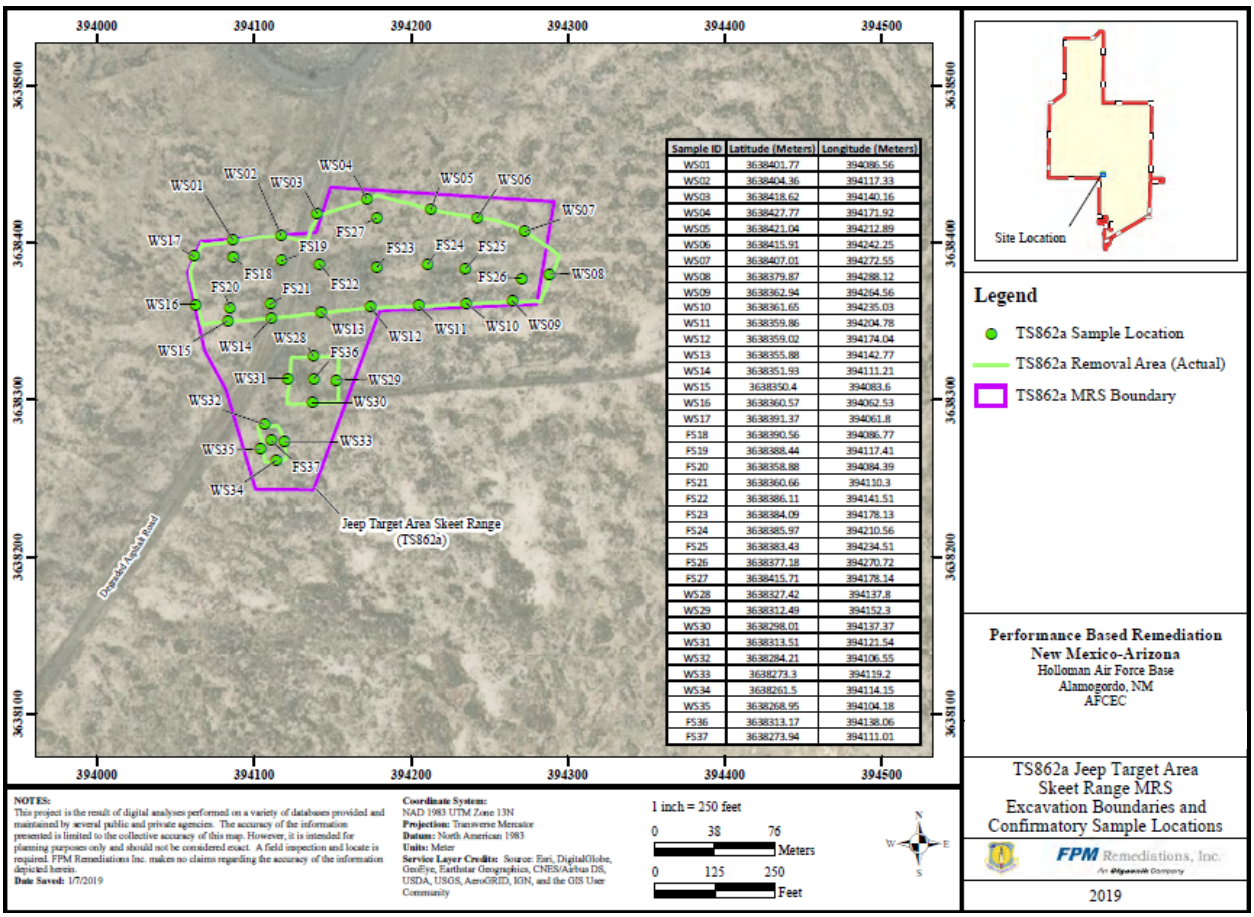


Figure F.10 AOC-859 (TS859) Location Map (FPM, 2019b).



Sample ID	Latitude (Meters)	Longitude (Meters)
WS01	3638401.77	394086.56
WS02	3638404.36	394117.33
WS03	3638418.62	394140.16
WS04	3638427.77	394171.92
WS05	3638421.04	394212.89
WS06	3638415.91	394242.25
WS07	3638407.01	394272.55
WS08	3638379.87	394288.12
WS09	3638362.94	394264.56
WS10	3638361.65	394235.03
WS11	3638359.86	394204.78
WS12	3638359.02	394174.04
WS13	3638355.88	394142.77
WS14	3638351.93	394111.21
WS15	3638350.4	394083.6
WS16	3638360.57	394062.53
WS17	3638391.37	394061.8
FS18	3638390.56	394086.77
FS19	3638388.44	394117.41
FS20	3638358.88	394084.39
FS21	3638360.66	394110.3
FS22	3638386.11	394141.51
FS23	3638384.09	394178.13
FS24	3638385.97	394210.56
FS25	3638383.43	394234.51
FS26	3638377.18	394270.72
FS27	3638415.71	394178.14
WS28	3638327.42	394137.8
WS29	3638312.49	394152.3
WS30	3638298.01	394137.37
WS31	3638313.51	394121.54
WS32	3638284.21	394106.55
WS33	3638273.3	394119.2
WS34	3638261.5	394114.15
WS35	3638268.95	394104.18
FS36	3638313.17	394138.06
FS37	3638273.94	394111.01

Figure F.11 AOC-862 (TS862) Location Map (FPM, 2019a).

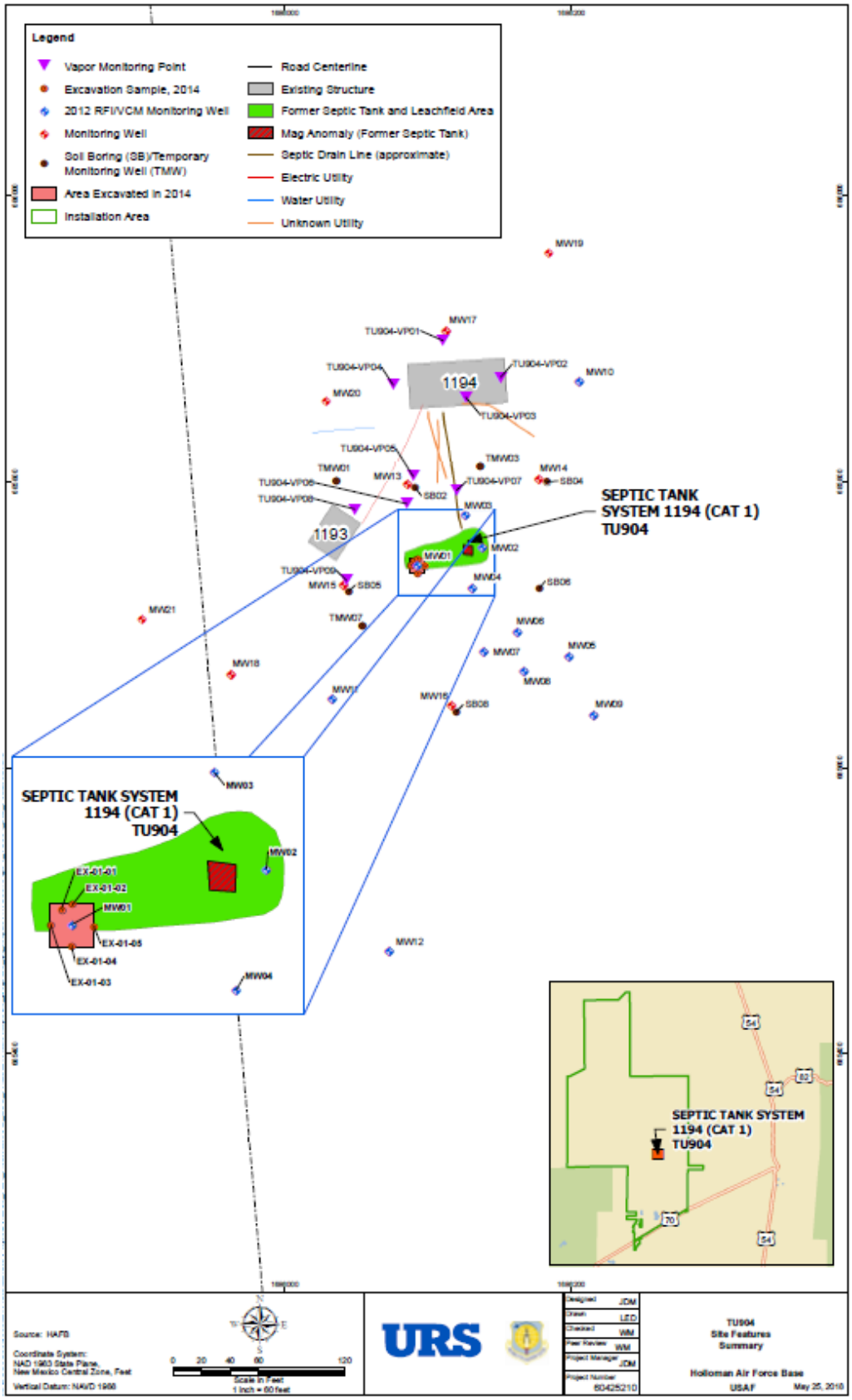


Figure F.12 AOC-1194 Location Map (URS, 2019c).

ATTACHMENT

DRAFT PERMIT

MODIFIED TABLES
PERMIT APPENDIX 4-A
SUMMARY OF SOLID WASTE MANAGEMENT UNITS/
AREAS OF CONCERN

TABLE A
(*Summary of SWMUs/AOCs Requiring Corrective Action*)

TABLE B
(*Summary of SWMUs/AOCs With Corrective Action Complete Without Controls*

TABLE C
(Summary of SWMUs/AOCs With Corrective Action Complete With Controls)

APPENDIX 4-A

TABLE A

SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN REQUIRING CORRECTIVE ACTION

SERIAL NO.	SWMU	ERP SITE ID	UNIT NAME
1	82	SD008	Building 131 Washrack
2	104	LF029	Former Army Landfill
3	111	RW042	Radioactive Waste Disposal Area
~~4~~	~~113B~~	~~DP030/SD033~~	~~Sludge Disposal Trenches Fire Training Area~~
~~5~~	~~122~~	~~N/A~~	~~Building 702 Waste Oil Tank~~
~~6~~	~~123~~	~~N/A~~	~~Building 704 Waste Oil Tank~~
~~7~~	~~141~~	~~SD027~~	~~Pad 9 Drainage Pit~~
~~8~~ 4	177	SS039	Building 1176 Sumps
~~9~~ 5	179	SS039	Discharge Box
~~10~~ 6	181	SS039	Building 1176 Drainage Trough
~~11~~ 7	229	SS059	T-38 Test Cell Fuel Spill Site
~~12~~ 8	AOC-1001	SS061	Building 1001 Fuel Spill Site
~~13~~	~~AOC H~~	~~SS018~~	~~VOC Spill Site~~
~~14~~ 9	AOC-Q	SS017	BX Gas Station Fuel Line Leaks
~~15~~ 10	AOC-RR	N/A	Buried RR Cars
~~16~~	~~AOC T~~	~~SS02/05~~	~~POL Storage Tank Spill Sites 1 & 2~~
~~17~~ 11	AOC-W	TU912	Building 301 Concrete UST
~~18~~ 12	AOC-X	SS074	Remotely Piloted Aircraft FSST Washrack
~~19~~ 13	AOC-Y	XU853a	EOD 50-pound Range
~~20~~	~~AOC-UST-889~~	~~TU/US-C515~~	~~Building 889 UST~~
~~21~~	~~AOC 823~~	~~SS823~~	~~Building 823 TPH in Soil~~
~~22~~	~~AOC-851~~	~~TS851~~	~~Former Skeet Range~~
~~23~~	~~AOC-859~~	~~TS859~~	~~Former Skeet Range 2~~
~~24~~	~~AOC 862~~	~~TS862~~	~~Jeep Target Area Skeet Range~~
~~25~~	~~AOC-1194~~	~~TU904~~	~~Building 1194 Septic System~~

APPENDIX IV-A

TABLE B

SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN WITH CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS

SWMU/AOC	DESCRIPTION	COMMENT
1	Building 55 Oil/Water Separator	Site NFAd in February 2001
2	Building 121 Oil/Water Separator	Site NFAd in February 2001
3	Building 130 Oil/Water Separator	Site NFAd in February 2001
4	Building 131 Oil/Water Separator	Site CACd in May 2017
5	Building 137 Oil/Water Separator	Site NFAd in February 2001
6	Building 193Oil/Water Separator	Site NFAd in February 2001
7	Building 198 Oil/Water Separator	Site NFAd in February 2001
8	Building 231 Oil/Water Separator	Site CACd in May 2017
9	Building 282 Oil/Water Separator	Site NFAd in February 2001
10	Building 283 Oil/Water Separator	Site NFAd in February 2001
11	Building 300 Oil/Water Separator	Site NFAd in February 2001
12	Building 304 Oil/Water Separator	Site NFAd in February 2001
13	Building 304A Oil/Water Separator	Site NFAd in February 2001
14	Building 306 Oil/Water Separator	Site NFAd in February 2001
15	Building 309 Oil/Water Separator	Site NFAd in February 2001
16	Building 315 Oil/Water Separator	Site NFAd in February 2001
17	Building 316 Oil/Water Separator	Site NFAd in February 2001
18	Building 500 Oil/Water Separator	Site NFAd in February 2001
21	Building 702 Oil/Water Separator	Site NFAd in February 2001
22	Building 704 Oil/Water Separator	Site NFAd in February 2001
23	Building 800 Oil/Water Separator	Site NFAd in February 2001
24	Building 801 Oil/Water Separator	Site NFAd in February 2001
25	Building 805 Oil/Water Separator	Site NFAd in February 2001
26	Building 809 Oil/Water Separator	Site NFAd in February 2001
27	Building810 Oil/Water Separator	Site NFAd in February 2001
28	Building 822 Oil/Water Separator	Site NFAd in February 2001
29	Building 827 Oil/Water Separator	Site NFAd in February 2001
30	Building 830 Oil/Water Separator	Site NFAd in February 2001
31	Building 855 Oil/Water Separator	Site NFAd in February 2001
32	Building 868 Oil/Water Separator	Site NFAd in February 2001
33	Building869 Oil/Water Separator	Site NFAd in February 2001
34	Building 902 Oil/Water Separator	Site NFAd in February 2001
35	Building 903 Oil/Water Separator	Site NFAd in February 2001
36	Building 1000 Oil/Water Separator	Site NFAd in February 2001
37	Building 1080 Oil/Water Separator	Site NFAd in February 2001

APPENDIX IV-A

TABLE B CONTINUED

SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN WITH CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS

SWMU/AOC	DESCRIPTION	COMMENT
38	Building 1080A Oil/Water Separator	Site NFAd in February 2001
39	Building 1092 Oil/Water Separator	Site CACd in March 2013
40	Building 1166 Oil/Water Separator	Site NFAd in February 2001
41	Building 1266 Oil/Water Separator	Site NFAd in February 2001
42	Building 1 Waste Accumulation Area	Site NFAd in February 2001
43	Building 55 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
44	Building 121 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
45	Building 195 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
46	Building 198 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
47	Building 280 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
48	Building 282 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
49	Building 300 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
50	Building 301 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
51	Building 308 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
52	Building 500 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
53	Building 638 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
54	Building 702 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
55	Building 702A Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
56	Building 807 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
57	Building 809 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.

APPENDIX IV-A

TABLE B CONTINUED

SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN WITH CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS

SWMU/AOC	DESCRIPTION	COMMENT
58	Building 822 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
59	Building 837 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
60	Building 844 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
61	Building 851 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
62	Building 855 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
63	Building 867 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
64	Building 869 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
65	Building 901 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
66	Building 901Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
67	Building 909 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
68	Building 910 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
69	Building 807 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
70	Building 1119 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
71	Building 1778A Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
72	Building 11778A Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
73	Building 1266 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
74	Building 7005 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
76	DRMO Non-Hazardous Waste Drain	EPA listed the site in 1988 as a SWMU with no further action required.

APPENDIX IV-A

TABLE B CONTINUED

SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN WITH CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS

SWMU/AOC	DESCRIPTION	COMMENT
77	RATSCAT Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
78	Trim pad 3 WAA	EPA listed the site in 1988 as a SWMU with no further action required.
79	Building 21 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
80	Building 55 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
81	Building 121 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
83	Building 134 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
84	Building 137 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
85	Building 283 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
86	Building 304A Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
87	Building 306 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
88	Building 309 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
89	Building 703 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
90	Building 801 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
91	Building 816 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
92	Building 822 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
93	Building 827 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
94	Building 830 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
95	Building 902 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.

APPENDIX IV-A

TABLE B CONTINUED

SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN WITH CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS

SWMU/AOC	DESCRIPTION	COMMENT
96	Building 1080 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
97	Building 1119 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
98	Building 1116 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
99	Building 1266 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
100	Pad 9 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
102	Acid Trailer Burial Site	EPA listed the site in 1988 as a SWMU with no further action required.
103	Causeway Rubble Disposal Area	EPA listed the site in 1988 as a SWMU with no further action required.
105	LF-19 Golf Course Landfill	Site CACd in March 2013
106	Main Base Landfill	Site NFAd in November 2005
107	Main Base Substation PCB Disposal Area	EPA listed the site in 1988 as a SWMU with no further action required.
108	LF-23 MOBSS Landfill Disposal Trench	Site CACd in March 2013
110	POL Rubble Disposal Area	EPA listed the site in 1988 as a SWMU with no further action required.
112	RATSCAT Disposal Area	EPA listed the site in 1988 as a SWMU with no further action required.
113A	OT-20 Sludge Disposal Trench	Site CACd in May 2017
113B	DP-030/SD-033 Grease Trap Disposal Pits and Cooking Grease Disposal Trenches	Site CACd in XXX 2022
114	OT-03 TEL Disposal Site	Site CACd in May 2017
115	LF-22 West Area Landfill #1 PCB Disposal Area	Site CACd in March 2013
116	LF-21 West Area Landfill #2	Site CACd in March 2013
117	Wire Spool Disposal Area	EPA listed the site in 1988 as a SWMU with no further action required.
118	OT-16 Building 21 Pesticide Holding Tank	Site CACd in May 2017
119	Building 121 Waste Oil Tank	Site NFAd in February 2001
120	Building 309 Waste Oil Tank	Site NFAd in February 2001
121	Building 316 Waste Oil Tank	Site NFAd in February 2001

APPENDIX IV-A

TABLE B CONTINUED

SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN WITH CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS

SWMU/AOC	DESCRIPTION	COMMENT
124	Building 752 Waste Oil Tank	Site NFAd in February 2001
125	Building 868 Waste Oil Tank	Site NFAd in February 2001
126	Building 1000 Waste Oil Tank	Site NFAd in February 2001
127	Building 1092 Waste Oil Tank	Site CACd in March 2013
128	Building 1166 Waste Oil Tank	Site NFAd in February 2001
129	Building 1191 and 1192 Spill Tanks	Site NFAd in February 2001
130	SS-46 Taxiway 4 Tank 28 Underground Waste Tank	Site CACd in March 2013
131	Waste Oil Bowsers	Site NFAd in February 2001
132	OT-16 Building 21 Entomology Leach Field	Site CACd in May 2017
133	Building 703 Wash Rack Discharge Pit	Site NFAd in February 2001
134	Buildings 902-925 Drainage Ditch	Site NFAd in February 2001
135	Building 1092 O/W Separator Drainage Pit (FT-31)	Site CACd in March 2013
136	Building 1119 Washrack Drainage Area	Site NFAd in November 2005
137	Building 1166 Test Track Drain Field (OT-38)	Site CACd in XXX 2018
138	Building 1166 Oil/Water Sep Drainage Pit	Site NFAd in February 2001
139	SWMU 139 Lake Holloman	Site NFAd in November 2005
140	SWMU 140 Lake Stinky	Site NFAd in November 2005
141	SD027 Pad 9 Drainage Pit	Site CACd in XXX 2022
142	Wastewater Influent Chamber	Site NFAd in February 2001
143	Bar Screen	Site NFAd in February 2001
144	Comminutor	Site NFAd in February 2001
145	Grit Chamber	Site NFAd in February 2001
146	Parshall Flume Wet Well	Site NFAd in February 2001
147	Splitter Box	Site NFAd in February 2001
148	Sewage Lagoon A	Closed June 30, 2000
149	Sewage Lagoon B	Closed June 30, 2000
150	Sewage Lagoon C	Closed June 30, 2000
151	Sewage Lagoon D	Closed June 30, 2000
152	Sewage Lagoon E	Closed June 30, 2000
153	Sewage Lagoon F	Closed June 30, 2000

TABLE B CONTINUED

SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN WITH CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS

SWMU/AOC	DESCRIPTION	COMMENT
154	Sewage Lagoon G	Closed June 30, 2000
155	Sludge Drying Beds	Site NFAd in February 2001
156	Imhoff Tanks (5)	Site NFAd in February 2001
157	ABLE 51 PCB Storage Area	Site NFAd in February 2001
158	PCB Storage Bunker	Site NFAd in February 2001
159	Building 500 Pb Storage Shelves	Site NFAd in February 2001
160	Building 500 NiCd Battery Storage Area	Site NFAd in February 2001
161	Building 844 Battery Storage Area	Site NFAd in February 2001
162	DRMO Scrap Metal Storage Area	EPA called this site a SWMU in 1988 but did not require corrective action [1].
163	DRMO Wood Pile	EPA called this site a SWMU in 1988 but did not require corrective action [1].
164	Building 1080 Pond	Site NFAd in February 2001
165	Building 1176 Pond (SS-39)	Site CACd in XXX 2018
166	SD-25 MOBSS Drainage Lagoon	Site NFAd in November 2005
167	Test Shed Launch Area Collection Basin	EPA identified it in 1988 as a SWMU without requiring further corrective action
169	Burn Kettle	EPA identified it in 1988 as a SWMU without requiring further corrective action
170	Fire Department Training Area 1 (FT-31)	Site CACd in March 2013
171	Fire Department Training Area 2 (FT-31)	Site NFAd in February 2001
173	Building 198 Sand Trap	EPA listed this as a SWMU in the 1988 RFA Report
174	Building 231 Hobby Shop Silver Recovery Unit	EPA listed this as a SWMU in the 1988 RFA Report
176	Building 844 Sand Trap	EPA listed this as a SWMU in the 1988 RFA Report
178	Building 1191 Fuel Runoff Pits	Site NFAd in February 2001
180	Building 301 Outdoor Drainage Flume	Site NFAd in February 2001
182	Building Floor Drains	Site NFAd in February 2001
183	Base Sewer System	Site CACd in May 2017
184	Wastewater Re-circulation Line	Site NFAd in February 2001

TABLE B CONTINUED

SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN WITH CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS

SWMU/AOC	DESCRIPTION	COMMENT
185	Building 332 Silver Recovery Unit	EPA identified this site as a SWMU in 1988
186	Hospital Silver Recovery Unit	EPA identified this site as a SWMU in 1988
187	West Area Silver Recovery Unit	EPA identified this site as a SWMU in 1988
188	Building 161 Acid Neutralization Unit	EPA identified this site as a SWMU in 1988
189	Building 232 Recycling Area	EPA identified this site as a SWMU in 1988
190	Building 500 Battery Neutralization Unit	EPA identified this site as a SWMU in 1988
191	Building 855 Concrete Pad	EPA identified this site as a SWMU in 1988
192	Coco Block House Disposal Well	EPA identified this site as a SWMU in 1988
193	Trash Dumpster	EPA identified this site as a SWMU in 1988
194-228	SWMUs no longer exist or could not be located	EPA identified this site as a SWMU in 1988
212	Former north Area Wash Rack	Site NFAd in February 2001
230	Building 828 Fuel Spill Site	Site NFAd in February 2001
231	Incinerator/Landfill	Site NFAd in February 2001
AOC-1	DP-64 Chemical Agent Site	Site CACd in May 2017
AOC-2	Sewage Drainage Pit NE of Building 864	Site CACd in March 2013
AOC-3	DP-63 Ammunition Yard Disposal Pit	Site CACd in May 2017
AOC-838	SS-72 TCE in Groundwater Upgradient of LF-21	Site CACd in May 2017
AOC-823	SS823 Building 823 TPH in Soil	Site CACd in XXX 2022
AOC-851	TS851 Former Skeet Range	Site CACd in XXX 2022
AOC-859	TS859 (SR859a) Former Skeet Range 2	Site CACd in XXX 2022
AOC-862	TS862 (TS862a) Jeep Target Area Skeet Range	Site CACd in XXX 2022
AOC-1088	SS-73 TCE in Groundwater Upgradient of SS-61	Site CACd in May 2017

SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN WITH CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS

SWMU/AOC	DESCRIPTION	COMMENT
AOC-1197	TU904 Building 1194 Septic System	Site CACd in XXX 2022
AOC-A	OT-16 Building 21 Pesticide Rinse Spill Area	Site CACd in May 2017
AOC-B	SS-65 Building 807 Test Cell Spill Area	Site CACd in May 2017
AOC-BBMS	Bare Base Mobility Squadron Spill Area	EPA called the site in the 1988 RFA but did not require corrective action [1].
AOC-C	SS-66 Building 835 Spills	Site CACd in May 2017
AOC-D	SD-26 Building 882 Spills	EPA called the site in the 1988 RFA but did not require corrective action [1].
AOC-E	SS-67 Buildings 903-909 Sand Blast Residues	Site CACd in May 2017
AOC-F	Asphalt Tank Spill Area (SS-68)	Site CACd in March 2013
AOC-FST837	Building 837 Fuel Spill Site	Site NFA November 2005
AOC-G	Atlas Substation PCB Spill	EPA called the site in the 1988 RFA but did not require corrective action [1].
AOC-I	SS-69 Fighter Wing Flight Line Spill	Site CACd in May 2017
AOC-J	Herbicide Sodium Arsenite Spill Area (SS-13)	Site CACd in XXX 2018
AOC-K	SS-12 Northeast Fuel Line Spill #1	Site CACd in May 2017
AOC-L	Early Missile Test Site (OT-37)	Site CACd in XXX 2018
AOC-M	RW-70 Building 18 Product Storage Tank	Site CACd in May 2017
AOC-N	SS-48 Building 137 Military Gas Tank Leak	Site CACd in March 2013
AOC-O	OT-45 Building 296 Old AGE Refueling Station	Site CACd in May 2017
AOC-P	OT-44 Building 301 Fuel Tank Leak	Site CACd in March 2013
AOC-R	JP-4 Fuel Line Spill Site (SS-06)	Site CACd in March 2013
AOC-RD	DP-62 Rita's Draw Disposal Pit	Site NFAd November 2005
AOC-S	Leaking Underground Storage Tank (BHUST)	Site CACd in March 2013
AOC-T	SS002/5 POL Storage Tank Spill Sites 1 and 2	Site CACd in XXX 2022
AOC-U	Lost River Basin	Site CACd in May 2017

SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN WITH CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS

SWMU/AOC	DESCRIPTION	COMMENT
AOC-UST-221	Building 221 UST (TU/US-C503)	Site CACd in XXX 2018
AOC-UST-300	Building 300 UST	Site CACd in May 2017
AOC-UST-301	Building 301 UST	Site CACd in May 2017
AOC-UST-684	Building 684 UST	Site CACd in May 2017
AOC-UST-882	Building 882 UST	Site CACd in May 2017
AOC-UST-889	TU515 Building 889 UST	Site CACd in XXX 2022
AOC-UST-898	Building 898 UST	Site CACd in May 2017
AOC-UST-901	Building 901 UST (TU/US-C506)	Site CACd in XXX 2018
AOC-UST-1097	Building 1097 UST (TU/US-C505)	Site CACd in XXX 2018
AOC-UST-1113	Building 1113 UST	Site CACd in May 2017
AOC-UST-1272	Building 1272 UST	Site CACd in May 2017
AOC-UST-2395	Building 2395 UST	Site CACd in May 2017
AOC-UST-7003	National Radar Test Facility UST (TU/US-C518)	Site CACd in XXX 2018
AOC-V	SS-57 Officer's Club	Site CACd in March 2013
AOC-PRI-A	OT-32 Primate Research Lab Sewer Line	Site CACd in XXX 2018
AOC-PRI-S	Primate Research Lab Borehole Disposal Site	EPA called the site in the 1988 RFA but did not require corrective action [1].
AOC-PRI-1	Primate Research Institute (PRI) Building 1264: Waste Accumulation Area	EPA called the site in the 1988 RFA but did not require corrective action [1].
AOC-PRI-2	PRI Building 1264 Solvent Burn Area (OT-35)	Site CACd in March 2013
AOC-PRI-3	PRI Building 1264: Biological Incinerator	EPA called the site in the 1988 RFA but did not require corrective action [1].
AOC-PRI-4	PRI Building 1264: Quarantine Area	EPA called the site in the 1988 RFA but did not require corrective action [1].
AOC-PRI-5	PRI Building 1264 Solvent Burn Area (OT-35)	Site CACd in March 2013

1. Unit underwent Corrective Action, was approved for No Further Action (NFA), and is limited by Institutional Controls

HOLLOMAN AIR FORCE BASE OPERATING AND CLOSED HAZARDOUS WASTE MANAGEMENT UNITS

OPERATING/CLOSED UNIT	DESCRIPTION	COMMENT
20,000-Pound Open Detonation (OD) Treatment Unit/SWMU 168	The OD Unit	Permitted in 1997 and is currently undergoing closure.
Container Storage Unit (CSU)/ SWMU 75	Hazardous Waste Management Unit	Closure of the CSU was approved on January 5, 2015. The Corrective Action Permit Part 4 remains in effect.
300-Pound Open Burn (OB) Unit. This site was listed in the 1988 RFA Report as SWMU 72	The OB Unit	The OB Unit was under Interim status from 1965 to 1979. HAFB conducted risk-based closure as per approved Work Plan of 1997. NMED approved Closure of this site on February 3, 1997.

APPENDIX IV-A

TABLE C

SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN WITH CORRECTIVE ACTION COMPLETE WITH CONTROLS

SWMU/AOC	Control(s) Needed
SWMU 19, Building 638 Oil/Water Separator	Because groundwater contamination is present beneath this SWMU, additional groundwater monitoring and corrective action activities must be conducted in association with ongoing activities at overlapping site SWMU 229 (Former T-38 Test Cell Fuel Spill).
SWMU 20, Building 639 Oil/Water Separator	Because groundwater contamination is present beneath this SWMU, additional groundwater monitoring and corrective action activities must be conducted in association with ongoing activities at overlapping site SWMU 229 (Former T-38 Test Cell Fuel Spill).
SWMU 101, LF010, Building 121 Landfill	Land use controls to prevent future residential use. Maintain the integrity and effectiveness of the cover, including making repairs to the cover as necessary to correct effects of settling, subsidence or erosion. The integrity of the cover shall not be compromised without prior approval from NMED.
SWMU 109, LF010, Old Main Base Landfill	Land use controls to prevent future residential use. Maintain the integrity and effectiveness of the cover, including making repairs to the cover as necessary to correct effects of settling, subsidence or erosion. The integrity of the cover shall not be compromised without prior approval from NMED**.**
SWMU 122	TU521 Building 702 Waste Oil Tank Site still in use. Site must be assessed when use is terminated.
SWMU 123	TU521 Building 704 Waste Oil Tank Site still in use. Site must be assessed when use is terminated.
SWMU 197, OT014, Former Entomology Shop	Land use controls to prevent future residential use. Engineering controls may be discontinued.

APPENDIX IV-A

TABLE C CONTINUED

SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN WITH CORRECTIVE ACTION COMPLETE WITH CONTROLS

SWMU/AOC	Control(s) Needed
AOC-4, West POL Fuel Spill Site	Land use controls to prevent future residential use. Upon abandonment of the West POL Yard, or its discontinued use, all remaining contaminated soil shall be removed and an investigation conducted to confirm adequate site remediation**.**
AOC-298, TU/US-C508, Building 298 UST	Because groundwater contamination is present beneath this AOC, additional groundwater monitoring and corrective action activities must be conducted in association with ongoing activities at overlapping site AOC-H (SS018 VOC Spill Site). All monitoring wells associated with this AOC will be retained for additional monitoring or corrective action activities at AOC-H.
AOC-H, SS018, VOC Spill Site	Land use controls to prevent future residential use until VOC concentrations in groundwater are demonstrated to be protective of a resident exposed to groundwater and indoor air via vapor intrusion from groundwater.