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13 November 2019

MEMORANDUM FOR DISTRIBUTION

FROM: AFCEC/CZOW
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Travis AFB CA 94535

SUBJECT: Final Amendment to the North, East, West Industrial Operable Unit (NEWIOU) Soil, Sediment and Surface Water (SSSW) Record of Decision (ROD), Travis Air Force Base, California

1. The attached file is the final Amendment to the NEWIOU SSSW ROD which describes fundamental changes to the selected soil remedies for Sites SD033 and SS0l6. The current soil remedy for both sites (Alternative S2 - Land Use and Access Restrictions) has performed adequately for the last 12 years. However, the soil contamination at Site SD033 was removed as part of an unrelated Oil/Water Separator decommissioning project, negating the need for these restrictions. Also, the Air Force needs to conduct a more active remedy at Site SS0I6 in order to reduce its environmental liability and to support the construction of a new three-bay hangar that will allow KC-46 refueling aircraft to be permanently assigned to Travis AFB.

2. If you have any questions regarding this final Amendment to the NEWIOU SSW ROD, please contact me via email at lonnie.duke@us.af.mil or by phone at (707) 424-7520.

DUKE.LONNIE.A.1231826242
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LONNIE A. DUKE
Restoration Program Manager

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TRAVIS AIR FORCE BASE, CALIFORNIA

Final

Amendment to the North/East/West Industrial Operable Unit Soil, Sediment, and Surface Water Record of Decision

Environmental Restoration Program Sites SS016 and SD033

Prepared by:

U.S. Army Corps of Engineers
Omaha District

Air Force Civil Engineer Center

November 2019

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SECTION 1

Introduction to the Sites and Statement of Purpose

1.1 Site Name and Location

Facility Name: Travis Air Force Base (AFB)

Site Location: Fairfield, Solano County, California

CERCLIS ID Number: CA5570024575

U.S. Environmental Protection Agency (EPA) SSID Number: 09M7

Operable Unit (OU)/Site: Soil, sediment, and surface water (SSSW) at two (2) North/East/West Industrial Operable Unit (NEWIOU) Environmental Restoration Program (ERP) sites designated as Sites SS016 and SD033 (EPA OU 2).

1.2 Statement of Purpose

This Record of Decision (ROD) Amendment presents the SSSW remedial actions for the NEWIOU at the Travis AFB Superfund Site (EPA ID: CA5570024575) in Solano County, California. The U.S. Air Force (Air Force) and the EPA co-selected the SSSW remedial actions in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and Travis AFB's Federal Facility Agreement (FFA). Remedial actions are conducted in accordance with CERCLA as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) 42 United States Code (USC) Section 9601 et seq., to the extent practicable, with NCP 40 Code of Federal Regulations (CFR) Part 300, and with Travis AFB's FFA, whose signatories include EPA Region 9, the California Environmental Protection Agency's (Cal/EPA) Department of Toxic Substances Control (DTSC), and the San Francisco Bay Regional Water Quality Control Board (Water Board).

The State of California, through the DTSC and the Water Board, concurs with the selected SSSW remedies. This ROD Amendment changes the soil remedies originally selected in the *Soil, Sediment, and Surface Water Record of Decision for the North/East/West Industrial Operable Unit* (NEWIOU SSSW ROD) (Travis AFB, 2006) for ERP Sites SS016 and SD033 as follows:

- **Site SS016:** Alternative 17 – Land Use Controls (LUCs) is changed to Alternative 18 – Excavation. In the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency. This remedy change does not modify the existing no action remedy for Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW.
- **Site SD033:** Alternative 17 – LUCs is changed to Alternative 16 – No Further Action. Prior OWS corrective actions at Site SD033 were non-CERCLA cleanup actions conducted in accordance with the *Corrective Action Plan for DERA-funded Oil/Water Separators* (CH2M HILL, 2016) under the authority of the California State Water Resources Control Board UST Cleanup Program.

The newly selected remedial alternatives (18 for Site SS016, 16 for Site SD033) were previously evaluated in the NEWIOU SSSW ROD (Travis AFB, 2006), but were not originally selected for the two (2) sites. The Air Force chose the previous remedies (listed above) as the most appropriate strategies for addressing potential human health and environmental risks from contaminated soil in the NEWIOU area at that

time. However, the Air Force has determined that the newly selected remedial alternatives are now more appropriate to meet Air Force mission requirements, as described in detail below.

Groundwater underlying the sites is not addressed in this ROD Amendment; however, it is addressed in the *Groundwater Record of Decision* (Groundwater ROD) (Travis AFB, 2014). The locations of Sites SS016 and SD033 at Travis AFB are shown on Figure 1-1.

The key circumstance requiring this ROD Amendment is that the Air Force desires the flexibility to redevelop these properties (execute new construction projects and activities) without any environmental restrictions. Therefore, the Air Force is taking additional measures toward reducing its environmental liability and ensuring that Travis AFB property is available to support military mission requirements. The changed soil remedial alternatives described in this ROD Amendment are expected to allow for unlimited use and unrestricted exposure to soil at Sites SS016 and SD033.

This ROD Amendment will become part of the Travis AFB Administrative Record file in accordance with the NCP in 40 CFR 300.825(a)(2). The Administrative Record contains the documents used in the selection of the soil, sediment, and surface water remedial actions. The Administrative Record for Air Force facilities is available for public review at the Air Force Civil Engineer Center (AFCEC) website: http://afcec.publicadmin-record.us.af.mil/search.aspx and can be viewed using Internet-capable computers at several local libraries. For example, the Vacaville Cultural Center Library at 1020 Ulatis Drive in Vacaville, California (95687) is open during the hours of 10:00 a.m. to 9:00 p.m. Monday through Thursday, Friday and Saturday from 10:00 a.m. to 5:00 p.m., and Sunday from 1:00 to 5:00 p.m.

The changed remedies for soil at Sites SS016 and SD033 selected in this ROD Amendment were chosen in accordance with CERCLA, as amended by SARA, and to the extent practicable, the NCP. The decisions are based on the Administrative Record for the two (2) sites, including the NEWIOU SSSW ROD (Travis AFB, 2006).

This ROD Amendment is issued by the Air Force as the lead agency. The Air Force is amending the ROD and the remedy for these two (2) sites within the NEWIOU in accordance with CERCLA and the NCP, as required by the Defense Environmental Restoration Program (DERP). The EPA is the lead oversight agency, and the State of California, represented by the DTSC and Water Board, is the support agency. The Air Force and EPA have jointly evaluated and selected the changed soil remedies. The DTSC and Water Board concur with the changed remedies. The Air Force shall not modify or terminate LUCs, implementation actions, or land usage without approval by EPA and the State of California. The Air Force shall seek concurrence by EPA and the state before any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for them.

The content and organization of this ROD Amendment is presented in accordance with Section 7.0 (Documenting Post-ROD Changes: Minor Changes, Explanations of Significant Differences [ESD], and ROD Amendments), including Highlight 7-2 (Sample Outline and Checklist for ESDs and ROD Amendments), as described in *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* (EPA, 1999).

1.3 Authorizing Signatures

This signature sheet documents Air Force approval of the amended remedies selected in this Amendment to the *North/East/West Industrial Operable Unit Soil, Sediment, and Surface Water Record of Decision*, Travis Air Force Base, Solano County, California.

8 Nov 19

JASON S. CAMPBELL, Colonel, USAF, P.E. Date
Deputy Director, Environmental Management
Air Force Civil Engineer Center

1.3 Authorizing Signatures

This signature sheet documents EPA approval of the amended remedies selected in this Amendment to the *North/East/West Industrial Operable Unit Soil, Sediment, and Surface Water Record of Decision*, Travis Air Force Base, Solano County, California.

October 31, 2019

ANGELES HERRERA
Assistant Director
Federal Facilities and Site Cleanup Branch
Superfund Division
U.S. Environmental Protection Agency Region IX

Date

1.3 Authorizing Signatures

This signature sheet documents DTSC concurrence with the amended remedies selected in this Amendment to the *North/East/West Industrial Operable Unit Soil, Sediment, and Surface Water Record of Decision*, Travis Air Force Base, Solano County, California.

11/7/2019

CHARLES RIDENOUR, P.E. Date
Supervising Hazardous Substances Engineer II
Sacramento Office
Brownfields and Environmental Restoration Program
California Department of Toxic Substances Control

1.3 Authorizing Signatures

This signature sheet documents Water Board concurrence with the amended remedies selected in this Amendment to the *North/East/West Industrial Operable Unit Soil, Sediment, and Surface Water Record of Decision*, Travis Air Force Base, Solano County, California.

10/24/19

MICHAEL MONTGOMERY
Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region

Date

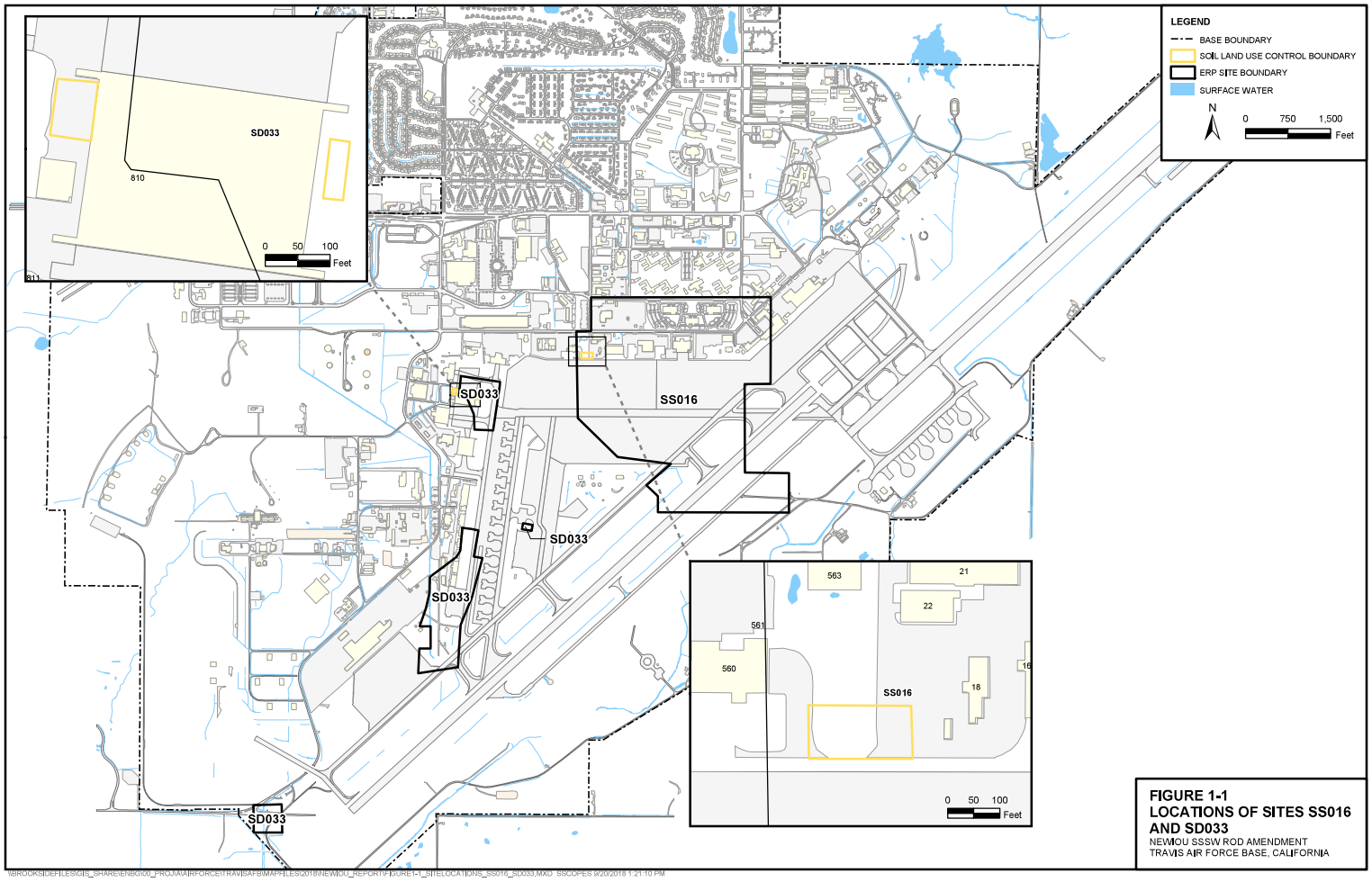

FIGURE 1-1
LOCATIONS OF SITES SS016 AND SD033
NEW IOU SSSW ROD AMENDMENT
TRAVIS AIR FORCE BASE, CALIFORNIA

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SECTION 2

Site Histories, Contamination, and Selected Remedies

This section of the ROD Amendment summarizes the history of soil contamination at Travis AFB ERP Sites SS016 and SD033, and the remedies previously selected in the NEWIOU SSSW ROD (Travis AFB, 2006) to address that contamination.

Overall descriptions of Travis AFB, including a physical description of the Base, land use, ecology, geology, hydrogeology, and surface water, are provided in the NEWIOU SSSW ROD, Part II – Decision Summary, Subsections 1.1 through 1.5. Similarly, an overview of the Travis AFB environmental programs, including the Compliance Branch, the Restoration Branch, and Pollution Prevention Branch, are provided in the NEWIOU SSSW ROD, Part II – Decision Summary, Subsections 2.1, 2.2, and 2.3. A few changes to the environmental programs at Travis AFB include the following:

- The Base no longer maintains the Base General Plan; instead, the Base has implemented the Installation Development Plan.
- The Restoration Branch no longer oversees the Installation Restoration Program (IRP); rather, the AFCEC/Travis AFB Installation Support Section (ISS) manages the Travis AFB ERP.
- The Groundwater ROD was finalized in June 2014 (Travis AFB, 2014).
- The Restoration Advisory Board no longer meets quarterly, but instead meets semiannually.
- A public meeting for the NEWIOU SSSW ROD Amendment was conducted in April 2015.

The following subsections provide a brief history of Sites SS016 and SD033, a summary of the contamination present at the sites, and a history of the process used to select the remedies currently being implemented at the sites to address this contamination.

2.1 Summary of Site Histories

The following subsections provide brief site history summaries for Sites SS016 and SD033. This summary is also provided in Sections 3.3.9 and 3.3.14 of the NEWIOU SSSW ROD (Travis AFB, 2006).

2.1.1 Site SS016 (Oil Spill Area; Facilities 11, 13/14, 20, 42/1941, and 139/144; and Storm Sewer Right-of-Way)

Site SS016 is in the center of the former East Industrial Operable Unit (EIOU) and comprises the OSA; Facilities 11, 13/14, 20, 42/1941, and 139/144; and the Storm Sewer Right-of-Way (SSRW). The OSA covers approximately 7 acres north of Facility 16. The OSA originally encompassed a grassy area in which waste oil had reportedly been spilled or disposed of. The area is now paved.

The site is within an active area of Travis AFB with ongoing maintenance activities (i.e., repair of flightline service equipment, aircraft, and engines; fuel storage; and vehicle maintenance), aircraft wash racks, and an aircraft parking apron. Most of the areas have been used since the 1940s through the present day to support military flightline operations. A variety of solvents, hydraulic fluids, oils, fuels,

and other materials are associated with these activities. A brief description of the historical and current uses for each area within Site SS016 follows:

- **OSA:** Historically, cleaning and degreasing operations occurred at Facility 18, which included a wash rack, an oil/water separator (OWS), and a subsurface open-top cement tank. The OSA originally encompassed an area where waste oil had reportedly been spilled or disposed of on a grassy area. This area was investigated in 1993, and no contamination was found based on soil gas samples. Currently, Facility 18 is present, and most of the area surrounding Facility 18 is paved and covered with buildings, although some of the area around Facility 18 still consists of exposed soil.
- **Facilities 11 and 42/1941:** Historically, the facilities included a hazardous waste storage area, a wash rack, an OWS, and four (4) 250-gallon aboveground storage tanks (ASTs). An underground storage tank (UST) was also formerly located east of the facilities. Facility 11 was a vehicle maintenance shop that generated waste oil, hydraulic fluid, and waste fuel. Facilities 11 and 42/1491 have been removed. A fuel pump area is currently located on the western side of the site.
- **Facility 13/14:** During the mid-1950s to the mid-1960s, a wash rack located between Facilities 13 and 14 was used. The facilities were used for paint stripping and cleaning parts using trichloroethene (TCE) and a dilute phosphoric acid solution. The total petroleum hydrocarbon (TPH) contamination may be associated with the now-removed USTs formerly located north and east of the site. Currently, Building 31 has replaced Facility 13/14, which was demolished in 1988.
- **Facility 20:** Former Facility 20 was an airfield control tower used to support military flightline operations, where a possible fuel leak in a product line from a former UST occurred. Chemicals of concern (COCs) found in the soil at Site SS016 during the EIOU Remedial Investigation (RI) (Roy F. Weston, Inc. [Weston], 1995) include polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs).
- **Facilities 139/144:** Historically, the facilities were used for vehicle maintenance (Facility 139) and vehicle body shops (Facility 144). The facilities included former USTs, a wash rack area, a steam cleaner, and floor drains that directed runoff to two (2) OWSs. To date, Facility 139 continues to be used for vehicle maintenance to support military flightline operations; Facility 144 was demolished in May 2018.

2.1.2 Site SD033

Site SD033 includes the West Branch of Union Creek, parts of Storm Sewer II (SS II), Facilities 810 and 1917, the area around the South Gate, and Outfall II. These facilities are included as one (1) site, because past activities at any of these locations have been identified as a possible contaminant source for SS II. The Air Force used these areas to handle stormwater runoff, fuel transport, aircraft maintenance, and aircraft washdown, which included the use of wash racks and OWSs. Chemicals used in these areas include fuel, lubricating oil, hydraulic fluids, chlorinated solvents, and soap solutions. A brief description of the historical and current uses for each area within Site SD033 follows:

- **Parts of SS II and the West Branch of Union Creek:** SS II was previously called Storm Sewer System B and currently includes underground piping and the West Branch of Union Creek. It captures runoff within the West Industrial Operable Unit (WIOU) and from a small portion of the EIOU and the West/Annexes/Basewide Operable Unit (WABOU). Runoff from SS II generally flows south and enters Union Creek south of Site SD033.
- **Facility 810:** Facility 810 was constructed in 1955 and was historically used for aircraft maintenance. An OWS, sump, and wash rack once located on the site have been removed, and Facility 810 no longer discharges to SS II. Currently, Facility 810 is used to refurbish aircraft stationed at Travis AFB.

- **Facility 1917:** The Air Force constructed Facility 1917 in 1956 for use as an aircraft washdown area. It is located southwest of the flightline apron in the central portion of the WIOU. An OWS and wastewater collection sumps used during washdown activities were located at Facility 1917 but have been removed. The facility is no longer in use.
- **South Gate Area (fuel distribution line location):** The South Gate Area was investigated as a result of petroleum hydrocarbon concentrations detected during historical investigations. Because a fuel distribution pipeline runs through the South Gate Area, results from field sampling in this area indicated that this area may have been a source of contamination.

On the west side of Facility 810, a former OWS (OW057) was demolished in 2003. The rubble of demolished OW057 and surrounding soil was excavated in 2016. OW052, formerly located on the east side of the facility, was also removed in 2016. The OWSs, sump, and wash rack that were previously located at the facility discharged to SS II. The facility no longer discharges to the storm sewer. Wastes generated at the facility included PD-680 (solvent), paints, lubricants, PCBs, and fuels. Thus, historical activities associated with the Facility 810 OWSs (OW052 and OW057) resulted in soil contaminated with a metal (cadmium) and a PAH (benzo(a)pyrene).

In 2009, Travis AFB conducted a sediment remedial action in the Union Creek portion of Site SD033. Sediment cleanup levels were achieved at all sampling locations, as outlined in the *Sites SD001 and SD033 Remedial Action Report* (Innovative Technical Solutions, Inc. [ITSI], 2010). No further actions are required for this part of Site SD033.

During summer 2015, a site investigation was conducted at OW052 and OW057 in accordance with the *POCO Investigation Work Plan for Oil/Water Separators OW040, OW047, OW048, OW049, OW050, OW051, OW052, OW053, OW054, OW055, OW056, and OW057* (OWS POCO Investigation Work Plan) (CH2M HILL, 2015). In 2016, OW052 was cleaned and removed, and soil was excavated to a depth of approximately 6.5 feet below ground surface (bgs). Approximately 8 cubic yards of soil were removed from this location. OW057 was also excavated along with surrounding soil to a depth ranging from 8 to 10 feet bgs. Approximately 66 cubic yards of soil were removed from the OW057 location (CH2M HILL, 2015). All excavated soil was disposed of in an approved landfill. Confirmation sampling was conducted, and results from the sampling confirmed that cleanup standards were achieved.

Also in 2016, two (2) historical soil boring locations (W0810B03 and W0810B04) were excavated to a depth of 6 inches while conducting the OWS corrective action, which also removed surface soil that contained elevated cadmium concentrations. Confirmation sample collection in these two (2) locations and laboratory analysis demonstrated that cadmium concentrations in these locations were now below residential standards. Results from the sampling confirmed that cleanup standards were achieved.

2.2 Summary of Site Contamination

To adequately evaluate the sites for closure, the Air Force reevaluated the site data to assess data quality for determining risk to human health in a residential land use scenario. The Air Force determined that the original RI data for Sites SS016 and SD033 did not have sufficiently low method detection limits when compared against current residential risk-based screening levels (RBSLs). Thus, new data were collected at Sites SS016 and SD033 during the 2016 data gap investigation to verify the current extent of soil contamination and to reevaluate human health risk under a residential exposure scenario. Results from the evaluation of the new data, along with historical data, were used to support the risk management decisions for these sites.

2.2.1 Site SS016 Soil Contamination

Soil contamination at Site SS016 is limited to the OSA, the area where the alternative change described in this ROD Amendment applies. Cleaning and degreasing operations occurred at Facility 18, which included a wash rack, an OWS (removed in 1998), and a former subsurface open-top cement tank. The OSA originally encompassed an area where waste oil had reportedly been spilled or disposed of on a grassy area to the northeast of Facility 18. During the EIOU RI (Weston, 1995), PAHs and PCBs were identified in the soil at depths ranging from 1 to 5 feet bgs, although only one (1) PCB (Aroclor-1260) was reported at a concentration of 0.452 milligram per kilogram (mg/kg), above the residential preliminary remediation goal of 0.24 mg/kg (EPA, 2018) in only one (1) location (11-0948-S001) as depicted on Figure 2-1. PCBs were not detected in the subsurface beneath most of the OSA.

TPH contamination was also previously identified throughout Site SS016. At two (2) locations (11-0103-S001 and 11-0102-S001) (Figure 2-1), the combined result for TPH as diesel (TPH-D, previously identified as TPH-extractable, or TPH-E) and TPH as gasoline (TPH-G, previously identified as TPH-purgeable, or TPH-P) was high enough that Tier 1 environmental screening levels (ESLs) for individual TPH fractions may have been exceeded. The Water Board Tier 1 ESLs are 230 mg/kg for TPH-D and 100 mg/kg for TPH-G (Water Board, 2016).

Volatile organic compounds (VOCs) were not designated as COCs in the NEWIOU SSSW ROD (Travis AFB, 2006), although use of VOC-containing chemicals was documented at the site. Because of advances in toxicology and laboratory analytical procedures since the EIOU RI data were collected, an evaluation of VOC detections in surface soils was conducted in 2016 as a part of the data gap investigation. The purpose of the data gap investigation was to collect soil data to evaluate the extent of soil contamination and support reevaluation of human health risks under a residential exposure scenario. The additional soil samples collected throughout Site SS016 in the 2016 investigation are also depicted on Figure 2-1.

In the original NEWIOU SSSW ROD, VOCs, TPH, PCB, and PAHs were all identified as COCs. The results of the data gap investigation, shown in Table 2-1, demonstrate that PAHs were the only contaminants above the 2017 EPA residential regional screening levels (RSLs) (EPA, 2018), which are used as RBSLs as described in detail in Section 4.2. Based on these data, VOCs, TPH, and PCBs were eliminated as COCs. An evaluation of the VOC detections in surface soils was conducted in the data gap investigation, because the use of VOC-containing chemicals was previously documented at the site. Results of the investigation found that concentrations of VOCs in soil were less than the RSL. Thus, only PAHs were retained as COCs.

The updated soil remedy to address the PAH contamination at Site SS016 is supported by the analytical results from the data gap investigation (CH2M HILL, 2018b) where benzo(a)pyrene, benzo(b)fluoranthene, benzo(a)anthracene, dibenz(a,h)anthracene, and naphthalene concentrations exceed their residential cleanup levels and were identified as COCs. The results from this data gap investigation were used to clarify the extent of the excavation footprint for this remedy. There are two (2) small excavation areas of approximately 4,500 and 900 square feet at Site SS016. The excavation at both areas will be conducted to a depth of approximately 0.5 foot bgs and will result in approximately 100 cubic yards of contaminated soil removed (target volume). Figure 2-2 presents the excavation areas, target depths, and boring locations that contain the impacted soil.

TABLE 2-1
Summary of Nature and Extent of Current Contamination – Site SS016
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Source of Contamination	Types and Characteristics of Contamination	COCs	Detected Concentration Range[a, b] (mg/kg)		Approximate Target Volume	Comments
			Minimum	Maximum		
The OSA originally encompassed an area where waste oil was reportedly spilled or disposed of on a grassy area. Oil spills, degreasing operations, leaking OWSs, equipment maintenance and repair, aircraft washing, hazardous waste storage, vehicle maintenance, stormwater runoff, and a wash rack are the principal contamination sources in these areas.	PAHs in soil, carcinogenic, immobile	Benzo(a)pyrene	0.00079	3.8 J-	100 yd^3	The OSA is mostly paved, but portions of the site remain unimproved.
		Benzo(b)fluoranthene	0.0015	5.7 J-		
		Benzo(a)anthracene	0.001	2.8 J-		
		Dibenz(a,h)anthracene	0.002	0.65		
		Naphthalene	0.00083 J	0.0036 J		
		Benzo(a)pyrene equivalent	0.00094	5.37		

[a] Source: *Data Gap Investigation Results Technical Memorandum for Soil Site SS016*, Table 6 (CH2M HILL, 2017).
[b] Detected concentrations were compared to the EPA residential RSLs (EPA, 2018).

Notes:

J = estimated concentration
J- = estimated concentration, biased low
yd^3 = cubic yard(s)

2.2.2 Site SD033 Soil Contamination

After the sediment remedial action was conducted in the Union Creek portion of Site SD033 (ITSI, 2010), soil contamination was limited to Facility 810 only at Site SD033. According to the NEWIOU SSSW ROD (Travis AFB, 2006), the soil COCs identified at Facility 810 were benzo(a)pyrene and cadmium. Both chemicals were associated with historical aircraft refurbishing activities. Because previous investigations had not defined the horizontal or vertical extent of COC soil contamination to residential levels, additional surface and subsurface soil samples were collected during the 2016 data gap investigation. Figures 2-2 and 2-3 show the historical sample locations, former OWS locations, 2015 sampling locations, 2016 data gap investigation sampling locations, and locations where previous soil concentrations exceeded the residential cleanup levels for benzo(a)pyrene (0.11 mg/kg) and cadmium (71 mg/kg) (EPA, 2018). Figures 2-2 and 2-3 also highlight the locations where OWS excavations and surface soil scrapes performed in 2016 have removed COC-impacted soil. No soil contamination is currently present at Site SD033 at concentrations requiring remediation to protect human health and the environment. Following is a summary of the fieldwork conducted around Facility 810 where contamination was found and subsequently removed.

On the west side of Building 810, near former OW057, the extent of benzo(a)pyrene exceeding the current residential cleanup level had been verified by soil samples (SB2244X57 through SB2247X57) (Figure 2-2) collected during the 2015 OW052 and OW057 Data Gap Investigations. Historical benzo(a)pyrene concentrations exceeded the current residential cleanup level (0.11 mg/kg) at only one (1) location: W0810B08, at a depth of 10 feet bgs (0.594 mg/kg). However, the soil surrounding this historical boring was excavated during the removal of OW057 in 2016. Confirmation samples confirmed that the limits of the excavation addressed the benzo(a)pyrene contamination in this area (Figure 2-2) (CH2M HILL, 2018a).

A cadmium concentration (38.2 mg/kg) detected in a surface soil sample (W0810B04) during the 1996 RI, also on the west side of Building 810, exceeded the residential cleanup level (5.2 mg/kg) identified in the *Data Gap Investigation Work Plan Technical Memorandum for Soil Sites SD033, SD043, and SS046* (CH2M HILL, 2016). According to the *Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046* (CH2M HILL, 2018), surface soil sample analytical results were to be compared to this residential cleanup level. After the Work Plan was finalized, the EPA released updated toxicity values (EPA, 2018) that changed the residential cleanup level for cadmium to 71 mg/kg. During the 2016 data gap investigation, surface soil samples (SS2456x33 through SS2459x33) were collected from four (4) locations near boring W0810B04 and analyzed for cadmium (Figure 2-2). The maximum cadmium concentration in the vicinity of W0810B04 was from SS2457x33 (0.31 J mg/kg) which is lower than the new residential cleanup level (71 mg/kg). The soil in the immediate vicinity of boring W0810B04 was removed during the OWS corrective action, and confirmation sample analysis demonstrated that the cadmium concentrations no longer exceeded the cadmium residential cleanup level (71 mg/kg) (CH2M HILL, 2018).

On the east side of Building 810, near former OW052, the extent of benzo(a)pyrene and cadmium had not been adequately defined to residential levels. Thus, two (2) soil boring locations (SB2451x33 and SB2452x33) and one (1) surface soil only location (SS2453x33) were analyzed for PAHs and cadmium during the 2016 data gap investigation. Benzo(a)pyrene did not exceed the current residential cleanup level (0.11 mg/kg) at any location. However, at one (1) historical surface sample location (W0810B03), the benzo(a)pyrene detection limit did exceed the current residential cleanup level, but the surface soil at this location was removed in 2016 while conducting the OWS corrective action.

Cadmium was not detected at concentrations exceeding the residential cleanup level (71 mg/kg) (EPA, 2018) at any location near the former OW052. The maximum cadmium concentration detected near former OW052 in 2016 was 0.62 mg/kg at SB2453x33 at a depth of 10 feet bgs. The maximum historical cadmium concentration detected during the 1996 soil RI near former OW052 was 40.9 mg/kg at W0810B01 at a depth of 9.5 feet bgs. Both concentrations are below the residential cleanup level for cadmium.

In the wash rack area, also on the east side of Building 810, only one (1) shallow soil sample (W0810B03) had historically been collected, and laboratory analysis of that sample detected a cadmium concentration of 15.1 mg/kg, which exceeded the residential cleanup level (5.2 mg/kg) identified in the Work Plan (CH2M HILL, 2016). As a result, two (2) surface soil samples from soil boring locations SS2454x33 and SS2455x33 were collected during the 2016 data gap investigation and analyzed for cadmium and PAHs. Cadmium concentrations did not exceed the residential cleanup levels (original or updated values) in either 2016 sampling location. The soil in the immediate vicinity of boring W0810B03 was removed during the OWS corrective action, and confirmation samples indicated that the cadmium concentrations no longer exceeded the residential cleanup level (71 mg/kg) (CH2M HILL, 2018).

Table 2-2 provides a summary of the residual soil contamination at Site SD033 after the 2016 data gap investigation and OWS removal effort and corresponding RSLs that are described in more detail in Section 4.2.

TABLE 2-2
Summary of Nature and Extent of Current Contamination – Site SD033
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Source of Contamination	Types and Characteristics of Contamination	COCs	Detected Concentration Range[a, b] (mg/kg)		Approximate Target Volume	Comments
			Minimum	Maximum		
Historical activities associated with the Facility 810 OWSs (OW052 and OW057) resulted in contaminated soil.	PAH in soil, carcinogenic, immobile	Benzo(a)pyrene	0.0037	0.176	NA	Soil contamination has been removed.
	Metals in soil, chronic toxicity, immobile	Cadmium	0.12	40.9		

[a] Source: NEWIOU SSSW ROD, Section 3.2.1 (Travis AFB, 2006) and *Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046*, Attachment 2 (CH2M HILL, 2018a).

[b] Detected concentrations were compared to the EPA residential RSLs (EPA, 2018).

Note:

NA = not applicable

2.3 Summary of Site Risks

The following sections summarize the human health risk assessment (HHRA) and ecological risk assessment (ERA). A detailed HHRA and ERA were summarized in the NEWIOU SSSW ROD (Travis AFB, 2006). The HHRA for Sites SS016 and SD033 was updated in 2017 (CH2M HILL, 2017) as a result of a data gap investigation conducted in 2016 to evaluate the current extent of soil contamination and to support reevaluation of human health risks to consider a residential exposure scenario that will provide risk managers with information necessary to assist in making remedial decisions and meeting risk management goals. The intent was not to revise the previous baseline HHRA reports, but to focus on revising the risk assessment calculations based on changes in the soil concentration data set and the HHRA inputs.

2.3.1 Human Health Risk Assessment

The HHRA estimates the risks that a site poses to human health if no additional action is taken, provides the basis for taking action, and identifies the contaminants and exposure pathways, if any, that need to be addressed by the remedial action.

2.3.1.1 Approach

The HHRA consists of the following basic components. Additional detailed information by site can be found in Attachment 2 of the *Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046* (CH2M HILL, 2018a) and Attachment 2 of the *Data Gap Investigation Results Technical Memorandum for Soil Site SS016* (CH2M HILL, 2017).

- **Selection of Chemicals of Potential Concern (COPCs) –** Identifies the constituents for inclusion in the human health risk quantification process (i.e., chemicals detected at least once in soil).
- **Exposure Assessment –** Identifies the pathways by which potential human exposures could occur, describes how they are evaluated, and evaluates the magnitude, frequency, and duration of the exposures.
- **Toxicity Assessment –** Summarizes the toxicity of the selected COPCs and the relationship between the magnitude of exposure and the occurrence of adverse health effects.
- **Risk Characterization –** Integrates information from the exposure and toxicity assessments to characterize the risks to human health from potential exposure to the selected soil COPCs. Numerical estimates of potential carcinogenic (cancer) risks and noncarcinogenic (noncancer) health effects are calculated.
- **Uncertainties Analysis –** Summarizes the basic assumptions used in the HHRA and the limitations of data and methodology.

The data used in these risk assessments were deemed to be of sufficient quality and quantity for their intended use. In accordance with EPA guidance, the following are considered in identifying COPCs:

- Identification of detected chemicals
- Comparison with background concentrations
- Evaluation of essential nutrients
- Frequency of detection and other indications of limited presence

A 95 percent upper confidence level (UCL) on the mean was calculated for COPCs with a sufficient number of data points, using the latest version of EPA's ProUCL software (EPA, 2016). The lower of the 95 percent UCL and the maximum concentration was used as the exposure point concentration (EPC).

Metals present at concentrations greater than their naturally occurring level were retained as COPCs. However, a metal detected in environmental media at a concentration greater than its background value may still occur naturally at the site and not be a consequence of a historical release. In that case, further evaluation of the detected metal concentrations is necessary to determine whether remedial action is warranted. Inorganic background concentrations were established based on a background investigation that was a part of the EIOU RI conducted in 1994 (Weston, 1995). Samples were collected, and a statistical distribution of concentrations was determined. Based on the methodology described in the 1994 background investigation (Travis AFB, 1995), inorganic reference/background concentrations were calculated.

The exposure areas are where individuals within or near the site might contact constituents in environmental media. The exposure scenario reflects the future potential use of the site. The current land use at each site is industrial, and land use at the sites is expected to remain industrial in the foreseeable future. Although residential land use is not likely within the foreseeable future, a hypothetical future residential scenario was evaluated to support risk management decisions. The hypothetical future residential scenario assumes a resident could be exposed to site-related constituents in soil through incidental ingestion, dermal contact, particulate inhalation, outdoor inhalation, and indoor inhalation/vapor intrusion.

COPCs can be divided into two (2) broad groups (carcinogens and noncarcinogens) on the basis of their tendency to cause cancer or adverse noncancer health effects. Estimates of potential cancer risks and noncancer health effects for each COPC are calculated for each exposure scenario and medium of interest. Cumulative risks, including risk from all COPCs for each exposure scenario and medium of interest, are also calculated. Because carcinogenic (cancer) and noncarcinogenic (noncancer) COPCs act differently, the levels of risk from exposure are expressed differently. Cancer risk is expressed as the probability that, over a lifetime, exposure to the site-related constituent will cause cancer. Noncancer hazard is expressed in terms of a ratio of the dose relative to an acceptable threshold dose above which adverse health effects may result.

The dose-response relationship for cancer effects is expressed as a cancer slope factor (CSF). The data used for estimating the dose-response relationship were used in lifetime animal studies or human occupational or epidemiological studies, where excess cancer risk has been associated with exposure to the chemical. In the HHRA, potential cancer risk is referred to as the potential excess lifetime cancer risk (ELCR), because it would be in addition to the risk of cancer from other sources, such as exposure to too much sun.

An ELCR of one (1) in one million means that there is a one (1)-in-one-million probability that exposure to the constituent will cause cancer. ELCRs were estimated using the following formula:

$$ELCR = CDI \times CSF$$

Where:

ELCR = Excess lifetime cancer risk (unitless probability)
CDI = Chronic daily intake averaged over a lifetime (milligrams per kilogram per day [mg/kg-day])
CSF = Cancer slope factor $(mg/kg\text{-}day)^{-1}$

For convenience, ELCR values are usually expressed using scientific notation, where one (1) in one million is expressed as 1×10^{-6} or 1E-06. The higher the ELCR value, the greater the probability that exposure to the contaminant will cause cancer.

For noncancer health effects, the body's protective mechanisms must be overcome before an adverse effect is manifested. If exposure is high enough and these protective mechanisms (or thresholds) are exceeded, adverse health effects can occur. The dose-response relationship for noncancer effects is

expressed as a reference dose (RfD). An RfD represents the constituent level that an individual may be exposed to that is not expected to cause any harmful effects. The ratio of the CDI divided by the RfD is expressed as the hazard quotient (HQ). HQs were estimated by using the following formula:

$$HQ = CDI/RfD$$

Where:

HQ = Hazard quotient; ratio of exposure to toxicity
CDI = Chronic daily intake averaged over a lifetime
RfD = Reference dose

A hazard index (HI) is generated by adding the HQs for all COPCs and pathways that affect the same target organ (e.g., liver) or that act through the same mechanism of action within a medium to which an individual may reasonably be exposed. An HI less than or equal to 1 indicates that adverse effects are unlikely from additive exposure to constituents (i.e., exposure is less than the RfD). An HI greater than 1 indicates that adverse noncancer health effects may occur from exposures. A higher HI does not indicate a greater probability of health effects.

These ELCR and HI estimates do not account for potential noncancer health effects from lead. EPA has no consensus toxicity factors (i.e., a noncancer RfD or a CSF) for inorganic lead, so it is not possible to calculate risk for lead as is done for other chemicals. EPA considers lead to be a special case because of the difficulty in identifying the classic threshold needed to develop an RfD. For this HHRA, potential risks from lead were evaluated by comparing the lead EPC in soil to the residential and industrial California Human Health Screening Levels (CHHSLs) of 80 and 320 mg/kg, respectively (Office of Environmental Health Hazard Assessment [OEHHA], 2009), and the EPA residential and industrial risk screening levels of 400 and 800 mg/kg, respectively (EPA, 2018). The results of the comparison to the CHHSLs are used to determine if lead is a COC.

2.3.1.2 Summary of Human Health Risk Estimates for Site SS016

Current and potential future human receptors at Site SS016 include residents and industrial/commercial workers. In order to assess the potential risk to current and future human receptors at the site, it is assumed that potential exposure to surface soil (0 to 2 feet bgs) and subsurface soils (2 to 10 feet bgs) could occur. Exposure to surface soils could occur during work activities for current and future industrial workers and during daily household activities at the site for hypothetical future residents. In addition, future residents may be exposed to subsurface soil down to 10 feet bgs that has been brought to the surface during building construction activities and mixed with surface soil. This is based on the assumption that excavation of soil to 10 feet bgs is needed for construction of standard basements of residential homes. Therefore, exposure to soil from 0 to 10 feet bgs was evaluated for residents. The 0- to 10-foot-bgs depth interval is referred to as mixed-zone soil as it combines the surface soil zone from 0 to 2 feet bgs with the subsurface soil zone from 2 to 10 feet bgs. This is likely an overly conservative assumption given the presence of radon gas at Travis AFB, which commonly limits construction of basements.

This updated HHRA is performed using a “risk ratio” approach and follows EPA RBSL (EPA, 2018) toxicity selection hierarchy. Risk calculations for residential and industrial scenarios were performed using RBSLs to calculate cancer risks and noncancer hazards. Potential cancer risk and noncancer hazards associated with exposure to soil were estimated by using the risk ratio method, and the residential and industrial RBSLs.

For risk calculations based on the EPA and U.S. Department of Defense (DoD) toxicity factor selection hierarchy, EPA RSLs (EPA, 2018) were used as RBSLs. For carcinogenic PAHs, RBSLs were calculated by the EPA RSL Calculator (EPA, 2017a), which uses the recently updated Integrated Risk Information System (IRIS) toxicity values for benzo(a)pyrene (EPA, 2017b).

For cancer risk estimates (or ELCR estimates), the EPCs are divided by the RBSLs that are designated as being potential carcinogens (i.e., cancer-causing). The resulting ratio is multiplied by the RSL target risk level (1×10^{-6}) to estimate chemical-specific risk for a reasonable maximum exposure (RME) scenario. The individual chemical-specific cancer risk ELCR estimates are combined to obtain an overall ELCR for soil.

For noncancer health hazard estimates, the EPC in soil is divided by the noncancer RBSL. The resulting ratio for an individual constituent is known as an HQ. The individual HQs are summed to estimate a noncancer HI.

Based on the updated risk calculations in the *Human Health Risk Assessment Update Technical Memorandum, Site SS016* (CH2M HILL, 2017), COCs requiring further action were identified in soil at Site SS016 for a residential exposure scenario. Specifically, carcinogenic PAHs were identified as COCs in both surface soil (0 to 2 feet bgs) and mixed-zone soil (0 to 10 feet bgs) at Site SS016, while no noncancer COCs were identified in soil based on residential exposure. No COCs were identified for an industrial exposure scenario.

Primary risk contributors to exposure to soil are chemicals with a cancer risk estimate greater than 1E-06 (1×10^{-6}) or those chemicals with a noncancer HQ greater than 1. Site-related primary contributors are considered COCs if total cancer risk is greater than 1E-06 (1×10^{-6}) or the noncancer HQ is greater than 1. As shown in Table 2-3, which presents risk estimates calculated using the EPA toxicity value selection hierarchy, the carcinogenic PAHs are identified as COCs.

TABLE 2-3
Human Health Risk Assessment Summary – Cancer and Noncancer Risk – Site SS016
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Site and Exposure Scenario	Total Cancer Risk[a]	Primary Contributor[b]	Noncancer HI[a]	Primary Contributor[c]
Site SS016				
Hypothetical future resident – surface soil (0 to 2 feet bgs)	2×10^{-5}	cPAHs (99%)	0.1	None
Hypothetical future resident – mixed-zone soil (0 to 10 feet bgs)	3×10^{-6}	cPAHs (98%)	0.02	None
Industrial/commercial worker – surface soil (0 to 2 feet bgs)	1×10^{-6}	None	0.01	None
Industrial/commercial worker – mixed-zone soil (0 to 10 feet bgs)	NA	NA	NA	NA

[a] Cancer risk and noncancer hazard estimates are based on the EPA/DoD toxicity factor selection hierarchy. DTSC evaluated the risks in accordance with California's Toxicity Criteria Rule, Sections 69021 and 69022(a), and noted that the risks slightly increased; however, they are still within the risk range.

[b] Primary contributors to the cancer risk are those chemicals with cancer risk greater than 1×10^{-6}. The percentage for the primary contributor represents the risk of the primary contributor divided by the total cancer risk. Percent contribution will not necessarily add to 100 percent as there are multiple chemicals with cancer risk estimates less than 1×10^{-6} that are not identified as primary contributors.

[c] Primary contributors to the HI are those chemicals with noncancer HQ greater than 1. The percentage for the primary contributor represents the HQ of the primary contributor divided by the HI. HI equals the sum of HQs. Percent contribution will not necessarily add to 100 percent as there are multiple chemicals with noncancer HQs less than 1 that are not identified as primary contributors.

Notes:

cPAH = carcinogenic polycyclic aromatic hydrocarbon
NA = not applicable

2.3.1.3 Summary of Human Health Risk Estimates for Site SD033

Risks were estimated for the potential future residential and current industrial exposure scenarios from 0 to 2 feet bgs (surface soil) and 0 to 10 feet bgs (surface soil and subsurface soil combined and referred to as mixed-zone soil). An updated HHRA for Site SD033 was conducted using the results of the 2016 data gap investigation (CH2M HILL, 2018a). The key aspects of the current site risks are summarized in the following sections.

Based on the updated risk calculations following the EPA/DoD toxicity factor selection hierarchy, the estimated cancer risk associated with residential exposure to surface soil and mixed-zone soil at Site SD033 are 2×10^{-4} and 1×10^{-4}, respectively. The primary contributors to cancer risk are chromium and arsenic for surface soil and mixed soil. However, chromium risks are overestimated as it is assumed that chromium found in soil at the site is 100 percent in the hexavalent form as required by EPA and DTSC, which is a conservative assumption. There is no information available that suggests chromium is only found in the 100 percent hexavalent form, as it is primarily found in the environment in the trivalent form. Hexavalent chromium is generally produced by industrial processes such as electroplating and wood preservation or used as a corrosion inhibitor. In addition, the chromium EPC is less than the Travis AFB maximum inorganic reference concentration (background). Therefore, chromium was considered a non-site-related chemical and not identified as a COC. Arsenic was not considered a COC in previous site investigations and risk assessments (Radian, 1996a; CH2M HILL, 1997). Arsenic was not identified as being related to past uses at the site (Travis AFB, 2006). Therefore, arsenic is not considered a COC in soil at Site SD033. Without chromium and arsenic considered as site-related COCs, the surface soil cancer risk estimate for a residential exposure scenario is 8×10^{-7}, and the noncancer HI is 1. However, each target-organ-specific HI is less than 1. The mixed-zone soil cancer risk estimate for a residential exposure scenario is 4×10^{-7}, and the noncancer HI is 2, but each target-organ-specific HI is less than 1. The residential risk from carcinogenic PAHs is 8×10^{-7} for surface soil and 3×10^{-7} for mixed-zone soil.

The estimated cancer risk associated with industrial exposure to surface soil at Site SD033 is 2×10^{-5}. The primary contributors to risk are arsenic and chromium. However, as noted above, chromium and arsenic are not considered site-related chemicals. The industrial risk from the carcinogenic PAHs in surface soil is 4×10^{-8}. The noncancer HI is less than the regulatory threshold of 1 for surface soil under the industrial scenario. Therefore, no primary contributors were identified based on noncancer HIs greater than 1 under the industrial scenario.

No COCs were identified for Site SD033 in surface and mixed-zone soil based on the EPA toxicity factor selection hierarchy, because the cancer risk estimates without non-site-related chemicals are less than 1×10^{-6}, and the target-organ-specific HIs are less than 1.

Table 2-4 presents risks and HIs with and without non-site-related chemicals under the EPA/DoD toxicity value selection hierarchy.

TABLE 2-4
Human Health Risk Assessment Summary – Cancer and Noncancer Risk – Site SD033
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Site and Exposure Scenario	Risk Driver[a]	EPC[b] (mg/kg)	Cumulative ELCR[c]	HI[d]
Site SD033 – Storm Sewer System B, Facilities 810 and 1917, and area around South Gate Area				
Hypothetical future resident – surface soil (0 to 2 feet bgs)	Chromium Arsenic	41.1 27.4	2×10^{-4}	1.0[e]
Hypothetical future resident – mixed-zone soil (0 to 10 feet bgs)	Chromium Arsenic	29.9 11.2	1×10^{-4}	0.7
Industrial/commercial worker – surface soil (0 to 2 feet bgs)	Chromium Arsenic	41.1 27.4	2×10^{-5}	0.1
Hypothetical future resident – surface soil (0 to 2 feet bgs) (without chromium and arsenic)	NA	NA	8×10^{-7}	0.2
Hypothetical future resident – mixed-zone soil (0 to 10 feet bgs) (without chromium and arsenic)	NA	NA	4×10^{-7}	0.3
Industrial/commercial worker – surface soil (0 to 2 feet bgs) (without chromium and arsenic)	NA	NA	5×10^{-8}	0.1

[a] The listed soil risk drivers only apply to the cumulative ELCR. There are no soil risk drivers for HI for any of the exposure scenarios.

[b] EPC calculated as a result of the updated HHRA for Site SD033. Source: *Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046*, Attachment 2 (CH2M HILL, 2018a).

[c] ELCR posed by contaminant under residential and industrial worker exposure scenarios. The potential risk posed by a carcinogenic compound is expressed as a probability value (e.g., 2×10^{-6}). Soil cleanup levels for carcinogenic chemicals equate to a cancer risk of 1×10^{-6} for the residential exposure scenario. Source: *Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046*, Attachment 2 (CH2M HILL, 2018a).

[d] Estimated noncancer risk posed by contaminant under residential and industrial worker exposure scenarios indicated by an HI. Source: *Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046*, Attachment 2 (CH2M HILL, 2018a).

[e] Individual target-organ segregated HIs are less than 1.

Note:

NA = not applicable; once chromium and arsenic are removed (because they are non-site-related contaminants) from the cumulative ELCR and HI, the risks from the remaining contaminants are less than 1×10^{-6} and 1, respectively. Therefore, no risk drivers are identified.

2.3.2 Ecological Risk Assessment

The ERA quantitatively and/or qualitatively evaluates the likelihood that adverse ecological effects (e.g., mortality, reproductive failure) will occur as a result of a release at the site, provides risk managers with information needed to achieve their ecological management goals, and identifies contaminants that need to be addressed by the remedial action, if necessary.

2.3.2.1 Approach

ERAs were completed for each of the sites and evaluated potential threats to the environment in the absence of any remedial action (URS, 2005). The ERA used a tiered approach to support the investigation of, and the remedial action decisions for, the NEWIOU SSSW sites, as follows:

- The Tier 1 assessment was qualitative in nature and identified the chemicals, habitats, and potential ecological receptors at each soil site.
- The Tier 2 assessment was a screening process that quantified potential risks to ecological receptors by comparing the following values for each target species:
  - The EPC is a chemical concentration to which a target species may be exposed at a site. The calculation of the EPC takes into account the number and chemical concentration of samples collected at the site.
  - Critical toxicity values (CTVs) are generated for each target species. The CTV is a chemical- and receptor-specific value that is expressed as a chemical concentration in soil and is derived from a selected exposure medium and pathway. It is based on reference toxicity values (RTVs) for plants and animals reported in toxicological databases, wildlife toxicological reviews, or scientific literature, as well as results of site-specific bioassays. CTVs are derived from the target species RTVs, bioaccumulation factors, species-specific exposure factors, and dietary compositions of target species. The CTVs are conservative values, because they assume animals will be resident within the area of each soil site, although the sites often are smaller than the home range (which is especially true for birds).
- The Tier 3 assessment validated the results of the Tier 2 assessment, using bioassays, to better define the potential risks and reduce uncertainties.

The risk characterization is to evaluate the evidence linking site contaminants with potential adverse ecological effects. This link is established by combining the exposure assessment, ecological effects assessment, toxicological data, and site chemical data through quantitative and qualitative evaluations. In the NEWIOU ERA, quantification of the potential ecological risk posed by a contaminant to a target species was conducted using an HQ approach, the ratio of the exposure level for the contaminant to a chemical-receptor concentration. The formula for the HQ is as follows:

$$HQ = EPC/CTV$$

The magnitude of the HQ provides a broad determination of the potential ecological toxicity/risk for a chemical, but is not an exact estimation of risk. Because of the uncertainties associated with the CTV calculation process, the NEWIOU ERA expresses potential risk as measured by the HQ as follows:

- No or low risk: < 1
- Low to medium risk: 1 to 10
- Medium to high risk: 10 to 100
- Very high risk: > 100

Section 3.2.2 of the NEWIOU SSSW ROD (Travis AFB, 2006) presents additional information on the ERA process and results.

2.3.2.2 Summary of Ecological Risk Estimates for Site SS016

ERAs were completed for each of the three (3) OUs in the NEWIOU. The overall purpose of an ERA is to provide a qualitative and quantitative evaluation of the actual or potential effects of contaminants on plants and animals (other than humans and domesticated species).

The EIOU ERA (which includes Site SS016) evaluated the potential total ecological risks to flora and fauna exposed to contaminants in the EIOU, including off-base portions of Union Creek. A two (2)-tiered approach was used to assess the potential ecological impacts from chemicals at the Base. Tier 1 was a strictly model-based screening approach for assessing potential impacts. Tier 2 consisted of a variety of site-specific field and laboratory studies designed to improve the estimate of potential risks occurring at the site and, where appropriate, to verify the results of modeled risks (Weston, 1995b). Several areas of concern that were identified as having chemicals of potential ecological concern (COPECs) are based on an HQ greater than 1. An HQ takes into account the potential exposure and toxicity of a chemical for ecological receptors, and an HQ of less than 1 indicates adverse impacts are unlikely to occur as a result of exposure to a particular chemical.

The ecological HQ values for the COPECs at Site SS016 were not estimated, because this site was eliminated from further ecological evaluation due to the site being mostly occupied by buildings and mostly covered with concrete pavement, asphalt, or gravel according to the EIOU RI (Travis AFB, 1995). Additionally, in some locations at Site SS016, the RI indicated that areas are of such poor quality that no natural communities exist, and consequently, limited ecological significance is expected.

2.3.2.3 Summary of Ecological Risk Estimates for Site SD033

The potential for risk from chemical contamination to ecological receptors that may inhabit Site SD033 was assessed in the *Ecological Technical Memorandum for the NEWIOU at Travis Air Force Base, California* (Ecological Technical Memorandum) (URS, 2005). Ecological receptor groups quantitatively evaluated include aquatic plants, fish, benthic and aquatic invertebrates, birds, and mammals. The findings of the ERA, which are discussed in detail in Section 7.10 of the Ecological Technical Memorandum (URS, 2005), demonstrated that potential exposure to PAHs that may be present in sediment in the West Branch of Union Creek posed an unacceptable level of risk to juvenile fish. Excavation of sediment in this area of the creek was the selected remedy to address potential ecological issues at the site (Travis AFB, 2006). In 2009, Travis AFB successfully carried out a sediment remedial action in the Union Creek portion of Site SD033. Sediment cleanup levels were achieved at all sampling locations, as outlined in the *Sites SD001 and SD033 Remedial Action Report* (ITSI, 2010). No further actions are required for this part of Site SD033 (CH2M HILL, 2018a).

2.4 Original Remedy Selection

Prior to this ROD Amendment, remedies to address the contaminated soil, sediment, and surface water at Sites SS016 and SD033 were identified, evaluated, selected, and implemented in accordance with CERCLA requirements. Descriptions of the historical remedy selection process are summarized in the NEWIOU SSSW ROD (Travis AFB, 2006) as follows:

- **NEWIOU RIs** – A summary of the NEWIOU RI Reports (Radian, 1995 and 1996a; Weston, 1995), including the nature and extent of contamination, risk assessments, and site descriptions, are provided in the NEWIOU SSSW ROD, Part II – Decision Summary, Subsections 3.1, 3.2, and 3.3. Descriptions of Sites SS016 and SD033 are provided in Subsections 3.3.9 and 3.3.14 of the NEWIOU SSSW ROD.
- **NEWIOU Feasibility Study (FS)** – The NEWIOU FS (Radian, 1996b), including analyses of all three (3) OUs in the NEWIOU, is summarized in the NEWIOU SSSW ROD, Part II – Decision Summary, Subsections 4.1 through 4.4. Alternatives 16 through 22 addressed soil, and include the following:
  - Alternative 16 – No Action for Soil and Sediment
  - Alternative 17 – Land Use Controls

- Alternative 18 – Excavation
- Alternative 19 – Soil and Bentonite Cap
- Alternative 20 – Backhoe, Ex Situ High Temperature Thermal Treatment, Disposal at Existing Off-Site Landfill
- Alternative 21 – In Situ Soil Vapor Extraction (SVE), Off-Gas Catalytic Oxidation
- Alternative 22 – In Situ Bioventing

The initial screening, detailed analysis, and comparative analysis of these potential soil remedial alternatives are summarized in Sections 4.2 and 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006). For Sites SS016 and SD033, Alternative 17 (LUCs) was deemed to be the most cost-effective alternative. Similarly, Alternative 20 was deemed to provide the highest degree of benefit at Site SS016, and Alternatives 21 and 22 the highest degree of benefit at Site SD033.

- **NEWIOU Proposed Plan** – Following completion of the NEWIOU FS (Radian, 1996b), the preferred SSSW remedies were submitted for public review and comment in the *North/East/West Industrial Operable Unit Proposed Plan for Soil, Sediment, and Surface Water* (Travis AFB, 1998). Statements regarding the State and public acceptance of the preferred remedies for these sites are provided in the NEWIOU SSSW ROD, Section 5.5.5. Comments received from the public on the remedy approaches are provided in the NEWIOU SSSW ROD, Part III – Responsiveness Summary (Travis AFB, 2006).

  In 2015, the *Proposed Plan for the North/East/West Industrial Operable Unit (NEWIOU) Soil, Sediment, and Surface Water ROD Amendment* (2015 NEWIOU Proposed Plan) (Travis AFB, 2015) was submitted for public review and comment. The Proposed Plan presented the proposed changes to the existing remedies at Sites SS016 and SD033. Information regarding the State and public review of the preferred remedies for these sites is provided in Section 9 of this ROD Amendment.

- **NEWIOU SSSW ROD** – The soil remedial actions originally selected for NEWIOU SSSW sites are provided in the NEWIOU SSSW ROD, Part II – Decision Summary, Subsections 5.1 through 5.8, and are briefly listed below:

  - Alternative 17– Land Use Controls (Site SS016 OSA)
  - Alternative 16 – No Action (Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, SSRW)
  - Alternative 17 – Land Use Controls (Site SD033)

  These subsections provide descriptions of the remedial alternatives evaluated for the NEWIOU soil sites; the criteria used to determine soil cleanup levels, including human health and ecological risk management issues; the site-specific remedial actions, LUCs, statutory determinations, remedial design/remedial action implementation, and schedule; and site closure.

  Descriptions of the statutory determinations for the selected remedies, including protectiveness; applicable or relevant and appropriate requirements (ARARs); cost-effectiveness; the use of permanent solutions, alternative treatment, or resource recovery technologies; the preference for treatment as a principal element of the remedies; and five (5)-year review requirements are described in NEWIOU SSSW ROD, Part II – Decision Summary, Subsections 5.5.1 through 5.5.6. Evaluations of the selected remedies' performance with respect to the ARARs in effect at the time are provided in NEWIOU SSSW ROD, Part II – Decision Summary, Section 6.0.

2.5 ROD Amendment Remedy Selection

The remedies selected in this ROD Amendment were originally evaluated in the NEWIOU SSSW ROD (Travis AFB, 2006) but not initially selected for the sites. The specific changes to the selected soil remedies at Sites SS016 and SD033 are summarized in this section and described in more detail in Section 4 – Descriptions of New Alternatives. In summary, the site soil remedies change as follows:

- **Site SS016 OSA:** Alternative 18 – Excavation. In the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency. This remedy change does not modify the existing no action remedy for Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW.
- **Site SD033:** Alternative 16 – No Further Action. Prior OWS corrective actions at Site SD033 were non-CERCLA cleanup actions conducted in accordance with the *Corrective Action Plan for DERA-funded Oil/Water Separators* (CH2M HILL, 2016) under the authority of the California State Water Resources Control Board UST Cleanup Program.

Prior to and during the remedial action, LUCs will continue to be maintained and monitored until the concentrations of hazardous substances in the soil are at levels that allow for unlimited use and unrestricted exposure. Successful completion of these changes to the soil remedies will allow unlimited use and unrestricted exposure to the sites and will continue to achieve protective and legally compliant remedies for soil at Travis AFB. The Air Force is responsible for implementing, maintaining, and monitoring the remedial actions (including the LUCs until they are removed upon approval of this ROD Amendment for Site SD033 and with EPA and state concurrence upon achieving all RAOs for Site SS016) identified herein for the duration of the remedies selected in this ROD Amendment. The Air Force will continue to exercise this responsibility in accordance with CERCLA and the NCP and at the appropriate time, will document these remedy changes in the Annual Land Use Control Report.

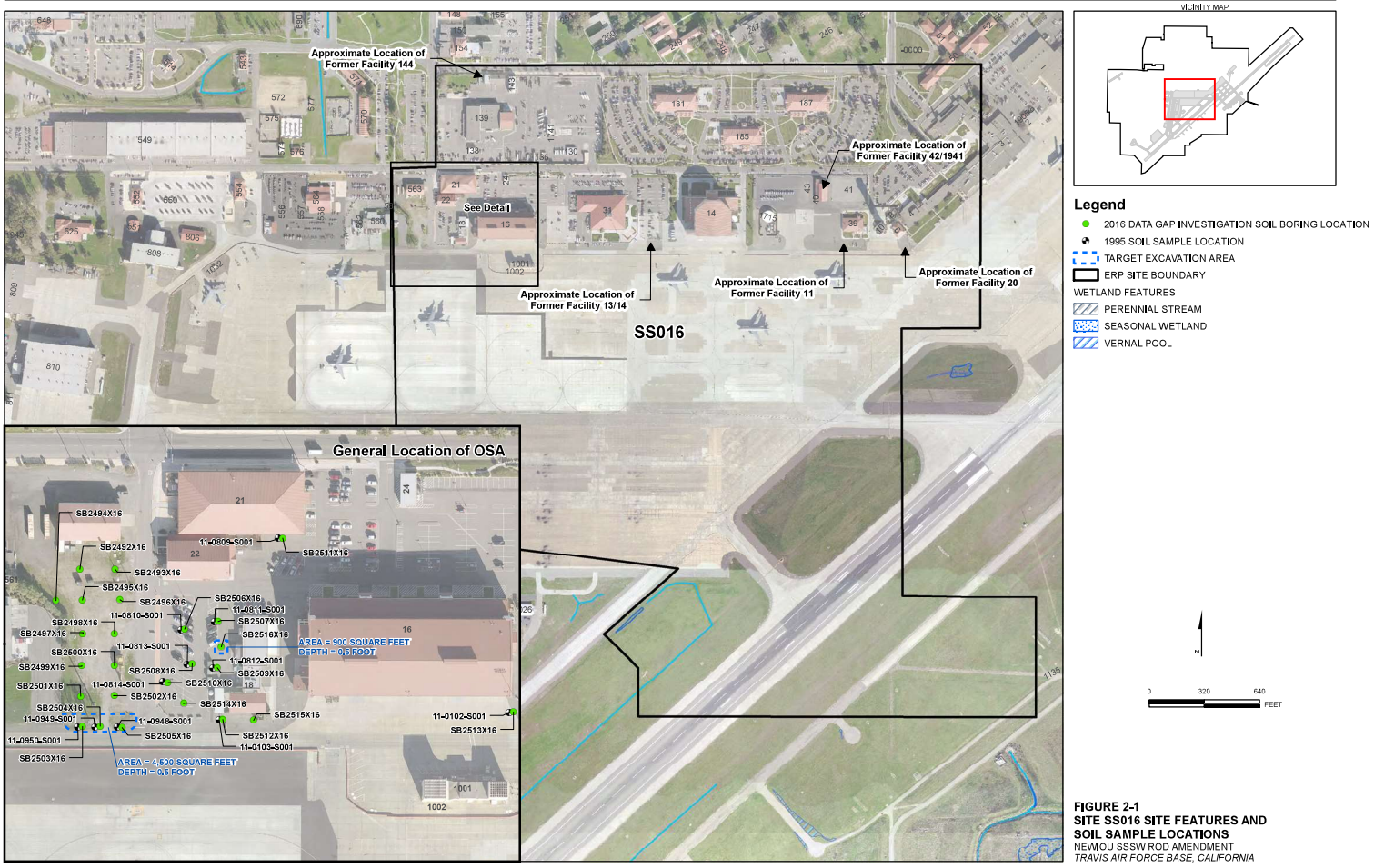

FIGURE 2-1
SITE SS016 SITE FEATURES AND SOIL SAMPLE LOCATIONS
NEW OU SSSW ROD AMENDMENT
TRAVIS AIR FORCE BASE, CALIFORNIA

\\BROOKS\DEFILES\GIS_SHARE\ENBG\00_PROJ\AIA\RFORCE\TRAV\SAFBI\MAPFILES\2018\482366_TECHMEMOWORKPLAN_2017\SS016\F32-1_SITEMAP.MXD SSCOPES 6/11/2018 11:48:38 AM

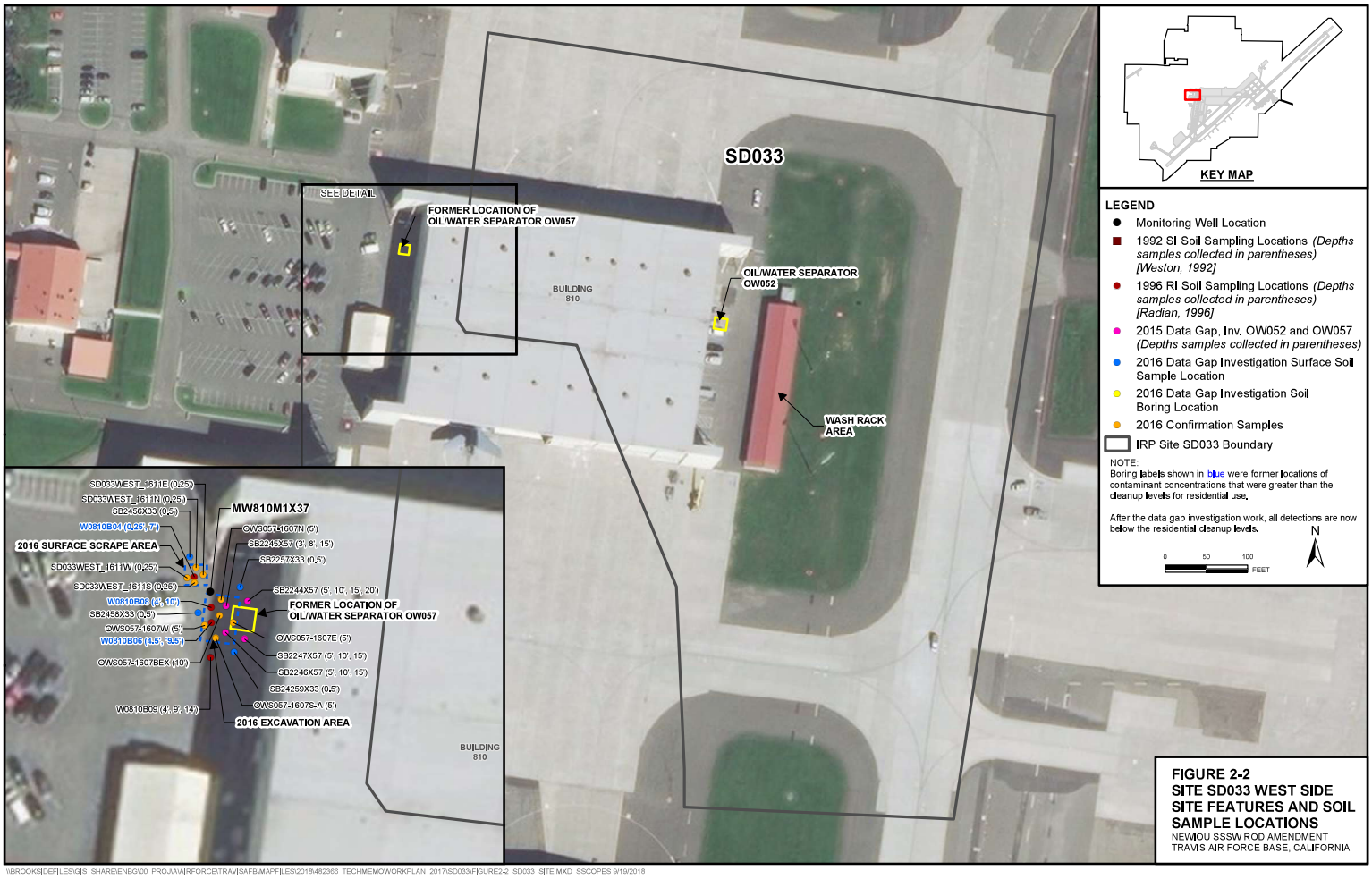

FIGURE 2-2
SITE SD033 WEST SIDE
SITE FEATURES AND SOIL SAMPLE LOCATIONS
NEW IOU SSSW ROD AMENDMENT
TRAVIS AIR FORCE BASE, CALIFORNIA

\\BROOKSDEFILES\GIS_SHARE\ENBG\00_PROJAVA\RFORCE\TRAVISAFB\MAPFILES\2018\482366_TECHMEMOWORKPLAN_2017\SD033\FIGURE2-2_SD033_SITE.MXD SSCOPES 9/19/2018

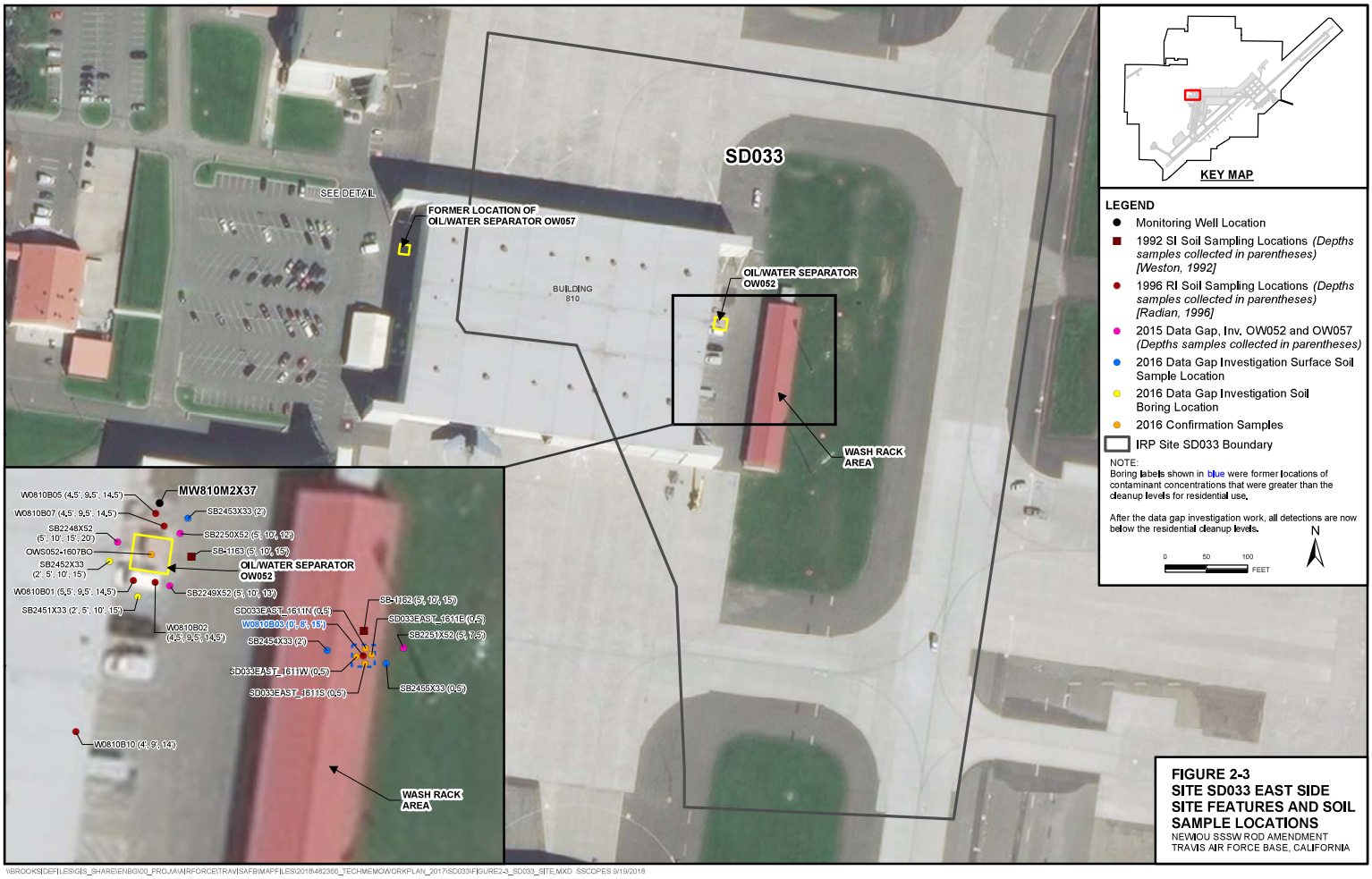

FIGURE 2-3
SITE SD033 EAST SIDE
SITE FEATURES AND SOIL SAMPLE LOCATIONS
NEW IOU SSSW ROD AMENDMENT
TRAVIS AIR FORCE BASE, CALIFORNIA

\\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJAVA\RFORCE\TRAVISAFB\MAPFILES\2018\482366_TECHMEMOWORKPLAN_2017\SD033\FIGURE2-3_SD033_SITE.MXD SSCOPES 9/19/2018

SECTION 3

Basis for the Document

This section summarizes the information that supports the development of this ROD Amendment to change the soil remedies previously selected for Sites SS016 and SD033 in the NEWIOU SSSW ROD (Travis AFB, 2006).

The amended remedies selected in this ROD Amendment are necessary, because a fundamental change to those remedies previously selected in the NEWIOU SSSW ROD (Travis AFB, 2006) is needed. Since the implementation of the original remedies, an action, as described below, has been conducted at Site SD033, and new information has been collected for both Sites SS016 and SD033 to support a change from the original remedy.

The Air Force has been taking additional measures toward reducing its environmental liability so properties can be opened to development to support the Base mission. Therefore, soil conditions at Sites SS016 and SD033 have been reevaluated to facilitate site closeout without restrictions. Information is summarized below and discussed in more detail in the following sections.

An updated HHRA (CH2M HILL, 2018c) for residential exposure was conducted, which concluded that the chemical concentrations at Site SS016 continue to be associated with unacceptable levels of risk. PAHs are the only COCs retained for this site. The changed soil remedial alternatives described in this ROD Amendment are more aggressive and will provide improved overall remedy protectiveness. After successful implementation of the changed soil remedial alternative, Site SS016 soil will be acceptable for unlimited use and unrestricted exposure.

In 2016, corrective actions were taken at Site SD033 for OWSs OW052 and OW057 in accordance with the Corrective Action Plan for DERA-funded Oil/Water Separators (CH2M HILL, 2016) under the authority of the California State Water Resources Control Board UST Cleanup Program. The excavation areas encompassed historical soil boring locations that were impacted by benzo(a)pyrene and surface soil containing elevated concentrations of cadmium (CH2MHILL, 2018a). As a result, the risk posed by these chemicals at the site was lowered. Thus, the soil LUCs that were selected in the NEWIOU SSSW ROD (Alternative 17) for the protection of human health and the environment are no longer necessary, and no additional actions are required at Site SD033. The site soil will be considered appropriate for unlimited use and unrestricted exposure upon approval of this ROD Amendment by EPA and the state, and soil LUCs will be removed.

At Sites SS016 and SD033, under the currently selected ROD remedy of Alternative 17, LUCs are enforced to prohibit residential use of the property. The expected outcomes of the current ROD remedies are that LUCs will remain in effect for as long as contaminants remain at the sites at concentrations above the residential cleanup level. Conversely, under the fundamentally changed remedies described in this ROD Amendment, the expected outcomes are that the residential soil cleanup levels are achieved and the current soil LUCs will be removed. Sites SS016 and SD033 would then be available for unlimited use and unrestricted exposure for soil.

SECTION 4

Descriptions of New Alternatives

This section provides the remedial action objectives (RAOs), soil cleanup levels, and descriptions of the changed soil remedial alternatives that will achieve the RAOs for Sites SS016 and SD033.

4.1 Remedial Action Objectives

RAOs provide a general description of what the soil remedial alternatives will accomplish. The RAOs for the soil remedies selected in this ROD Amendment are as follows:

- Prevent potential future residents or current Base workers from ingestion, inhalation, or coming into direct dermal contact with PAHs above acceptable residential exposure levels.
- Restore contaminated sites to achieve residential soil cleanup levels (refer to Table 4-1), which will allow for unlimited use of and unrestricted exposure to the soil, while minimizing interference with the Base military mission.

The fundamental difference between RAOs for the remedies originally selected in the NEWIOU SSSW ROD (Travis AFB, 2006) and the changed remedies described in this ROD Amendment is in the outcome of remediation. Achieving the listed RAOs will result in residual soil contaminants meeting residential cleanup standards and will allow the LUCs currently being enforced to be removed. At that time, the soil at each site will be suitable for unlimited use and unrestricted exposure. Removal of encumbrances to the use of the sites will improve Travis AFB's capacity to adapt to future military mission requirements and carry out new activities at the sites. This is in contrast to the objective of the original remedies selected in the ROD, which was to manage soil contamination at concentrations greater than the residential cleanup levels by restricting land use.

4.2 Soil Cleanup Levels

This section describes the risk-based soil cleanup standards for the contaminants in soil identified as COCs at Sites SS016 and SD033, based on the revised assumption of residential exposure for unlimited use.

Cleanup standards for contaminants in soil at Sites SS016 and SD033 are numerical cleanup levels that determine when concentrations of COCs have been achieved that allow for unlimited use and unrestricted exposure; these are generally based on residential exposure to the contaminant. The numerical cleanup levels to be achieved by the final remedies selected in this ROD Amendment are presented in Table 4-1, and represent the concentrations equivalent to a 1×10^{-6} carcinogenic risk or the concentration equivalent to an HI of 1 for noncancer risk. The risk calculations are conducted using the EPA RSLs (EPA, 2018), which are used as RBSLs. The RBSLs are the risk-based cleanup levels for the sites. Additional details on the risk assessment calculations are included in Attachment 2 of the *Data Gap Investigation Results Technical Memorandum for Soil Site SS016* (CH2M HILL, 2018b) and Attachment 2 of the *Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046* (CH2M HILL, 2018a).

For PAHs and metals in soil, risk-based cleanup levels supportive of residential use were developed based on exposure via ingestion of soil, inhalation, and dermal contact. The cleanup levels for COCs in soil are based on the 0- to 2-foot-bgs and 0- to 10-foot-bgs depth ranges. For metals, the maximum detected concentrations were compared to the respective inorganic reference concentration (as background)

according to the WABOU RI (CH2M HILL, 1997). For cPAHs, RBSLs were calculated by the EPA RSL Calculator (EPA, 2017a), which uses the recently updated toxicity values for benzo(a)pyrene in IRIS (EPA, 2017b). Concentrations of PAHs were converted to a benzo(a)pyrene equivalent, and total benzo(a)pyrene equivalents per soil sample were compared to the RBSL for benzo(a)pyrene. The benzo(a)pyrene equivalent is used for PAHs, because PAHs are a complex mixture of individual cPAHs, and toxicity values are only available for benzo(a)pyrene. Further discussion of benzo(a)pyrene equivalent is included in Attachment 10 of the *Data Gap Investigation Results Technical Memorandum for Soil Site SS016* (CH2M HILL, 2018b) and Attachment 10 of the *Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046* (CH2M HILL, 2018a).

The industrial use soil cleanup levels originally specified in the NEWIOU SSSW ROD (Travis AFB, 2006) are provided for comparison to the cleanup levels based on current residential risk-based standards. The site-specific COCs and their corresponding cleanup levels under a residential exposure scenario are listed in Table 4-1, along with the basis for the cleanup levels provided in the footnotes.

As with the original NEWIOU SSSW ROD (Travis AFB, 2006), no soil cleanup levels are necessary for ecological receptors. As stated in the NEWIOU SSSW ROD, there are no chemicals of ecological concern (COECs) associated with Site SS016, and there is no potential unacceptable ecological risk at the site. COECs in the site soil will not adversely affect the populations of species (Travis AFB, 2006).
For Site SD033, there is no risk to ecological receptors posed by soil contaminants in the vicinity of Facility 810 (Travis AFB, 2006). The NEWIOU SSSW ROD selected Alternative 18 – Excavation to address PAH-contaminated sediment in the West Branch of Union Creek for the protection of ecological receptors. Excavation of contaminated sediment was successfully completed (ITSI, 2010).

TABLE 4-1
Summary of Soil Cleanup Levels
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

		Residential Soil Cleanup Concentration (mg/kg)	
Site	**Soil COC**	**Original ROD[a]**	**ROD Amendment[b]**
Site SS016	Benzo(a)pyrene	0.062	0.11
	Benzo(b)fluoranthene	0.62	1.1
	Benzo(a)anthracene	0.62	1.1
	Dibenz(a,h)anthracene	-	0.028
	Naphthalene	-	2
	Benzo(a)pyrene equivalent	-	0.11
Site SD033	Benzo(a)pyrene	0.062	0.11
	Cadmium	NA[c]	71

[a] Soil cleanup levels based on values provided in the NEWIOU SSSW ROD (Section 5.3) for a residential exposure scenario (Travis AFB, 2006).

[b] This number is derived from applying California's OEHHA toxicity value only at this site. DTSC and the Air Force disagree whether California's Toxicity Criteria Rule (Title 22, CCR Sections 68400.5, 69020, 69021, and 69022) is an Applicable or Relevant and Appropriate Requirement (ARAR) and will pursue resolution of that disagreement as part of a pending dispute at another location. Use of California's OEHHA toxicity values to show achievement of UU/UE at this site will not affect either DTSC's or the Air Force's respective positions on California's Toxicity Criteria Rule in any other context or in any dispute resolution process.

[c] In the NEWIOU SSSW ROD (Travis AFB, 2006), cleanup levels were not developed for cadmium, as it was not identified as a COC for the site.

Note:

NA = not applicable

4.3 Descriptions of Alternatives

This subsection describes the soil remedial alternatives selected to achieve the RAOs. These newly selected remedies were evaluated in the NEWIOU SSSW ROD (Travis AFB, 2006), but were not originally selected for the sites. Descriptions of the soil remedies originally selected in the NEWIOU SSSW ROD and the changed remedies described in this ROD Amendment are provided in Table 4-2.

The Air Force will continue to maintain LUCs as the selected remedy for Site SS016 as described in Section 5.4 of the NEWIOU SSSW ROD (Travis AFB, 2006) until the RAOs as described in Section 4.1 of this ROD Amendment are achieved. Once the Site SS016 RAOs are achieved, the Air Force will obtain concurrence from EPA and the state before the Site SS016 LUCs are removed. If the soil cleanup levels listed in Table 4-1 of this ROD Amendment are not achieved, the Air Force will continue to maintain the existing LUCs and comply with all notification and inspection requirements identified in Section 5.4 of the NEWIOU SSSW ROD (Travis AFB, 2006), including notifying EPA and the state within 10 days should a breach of the LUCs occur, and identifying how the Air Force has or will address the breach. In addition, the Air Force will also notify EPA and the state 30 days in advance of any proposed land use changes inconsistent with LUCs, and at least 6 months prior to any sale of property with LUCs.

TABLE 4-2
Summary Descriptions of Selected Soil Remedies
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

	Selected Remedy Description	
Site	**Original ROD[a]**	**ROD Amendment[b]**
Site SS016 – OSA Area	Alternative 17 – Land Use Controls Land use restrictions are used to prohibit the excavation or disturbance of contaminated soil and prevent residential use, because residential cleanup levels are exceeded. Fences and signs are posted to prevent access. Land use and access restrictions enforced under Alternative 17 are described in the NEWIOU SSSW ROD, Part II – Decision Summary, Subsection 5.4.	Alternative 18 – Excavation/Off-base Disposal Soil with contaminant concentrations greater than residential cleanup levels, as determined by confirmation sampling, is excavated and transported by truck to an off-base EPA-approved facility. The excavation void is backfilled with clean, imported fill soil that will be sampled to confirm it is suitable for residential use prior to placement in the excavation void. In the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency. No land use restrictions are required under Alternative 18. Risks posed by residual contaminant concentrations in soil are acceptable under a residential exposure scenario. Soil at the site is suitable for unlimited use and unrestricted exposure. In the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency.
Site SS016 – Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW	Alternative 16 – No Action for Soil and Sediment No remediation activities, monitoring, or long-term site management activities are conducted, and no costs are incurred. No land use restrictions are required under Alternative 16. Risks posed by residual contaminant concentrations are acceptable under a residential exposure scenario. Soil at the site is suitable for unlimited use and unrestricted exposure.	Alternative 16 – No Action for Soil and Sediment[c] No remediation activities, monitoring, or long-term site management activities are conducted, and no costs are incurred. No land use restrictions are required under Alternative 16. Risks posed by residual contaminant concentrations are acceptable under a residential exposure scenario. Soil at the site is suitable for unlimited use and unrestricted exposure.

TABLE 4-2
Summary Descriptions of Selected Soil Remedies
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Site	Selected Remedy Description	
	Original ROD[a]	**ROD Amendment[b]**
Site SD033	Alternative 17 – Land Use Controls Land use restrictions are used to prohibit the excavation or disturbance of contaminated soil and prevent residential use, because residential cleanup levels are exceeded. Signs are posted to prevent access to the site and notify Base personnel of the presence of contaminated soil. Land use and access restrictions enforced under Alternative 17 are described in Part II – Decision Summary, Subsection 5.4 of the NEWIOU SSSW ROD (Travis AFB, 2006).	Alternative 16 – No Further Action[d] No remediation activities, monitoring, or long-term site management activities are conducted, and no costs are incurred. No land use restrictions are required under Alternative 16. Risks posed by residual contaminant concentrations are acceptable under a residential exposure scenario. Soil at the site is suitable for unlimited use and unrestricted exposure.

[a] Soil, sediment, and/or surface water remedy as described in the NEWIOU SSSW ROD, Section 4.0 (Travis AFB, 2006).

[b] The changed remedy described in this ROD Amendment is a remedy described in the NEWIOU SSSW ROD, Section 4.0, but not originally selected for the subject site.

[c] This ROD Amendment does not modify the existing no action remedy for Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW.

[d] Prior OWS corrective actions at Site SD033 were non-CERCLA cleanup actions conducted in accordance with the *Corrective Action Plan for DERA-funded Oil/Water Separators* (CH2M HILL, 2016) under the authority of the California State Water Resources Control Board UST Cleanup Program.

4.4 Descriptions of Remedy Components

Descriptions of the key remedy components for the Sites SS016 and SD033 soil remedial alternatives are summarized in Tables 4-3, 4-4, and 4-5.

TABLE 4-3
Summary of Remedy Components – Site SS016 OSA Area
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Component	Original ROD Alternative 17 – Land Use Controls[a]	ROD Amendment Alternative 18 –Excavation/Off-base Disposal
Remediation technologies and materials	None	Excavation, offsite disposal
Containment/storage	None	None
Institutional controls	Yes, as described in the NEWIOU SSSW ROD, Section 5.4.	None
O&M activities	• Annual site inspection and reporting • Periodic maintenance of signs and placards	None
Monitoring	None	None[b]

[a] In the original ROD, soil contaminants and LUCs remained in place in perpetuity.

[b] Following excavation of contaminated soil, confirmation soil samples will be collected to verify that the impacted soil has been removed. Thus, monitoring is not required.

Note:

O&M = operations and maintenance

TABLE 4-4
Summary of Remedy Components – Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Component	Original ROD Alternative 16 – No Action	ROD Amendment Alternative 16 – No Action for Soil and Sediment
Remediation technologies and materials	None	None
Containment/storage	None	None
Institutional controls	None	None
O&M activities	None	None
Monitoring	None	None

TABLE 4-5
Summary of Remedy Components – Site SD033
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Component	Original ROD Alternative 17 – Land Use Controls*	ROD Amendment Alternative 16 – No Action for Soil and Sediment
Remediation technologies and materials	None	None
Containment/storage	None	None
Institutional controls	Yes, as described in the NEWIOU SSSW ROD, Section 5.4.	None
O&M activities	• Annual site inspection and reporting • Periodic maintenance of signs and placards	None
Monitoring	None	None

* Based on the original ROD, LUCs remain in place in perpetuity.

4.5 Common Elements and Distinguishing Features of Each Alternative

The alternatives include common elements, as well as distinguishing features unique to each option. Descriptions of these common elements and distinguishing features for the soil remedies at Sites SS016 and SD033 are summarized below in Tables 4-6 and 4-7.

Common elements are as follows:

- All newly selected alternatives are compatible with the intended site reuse and expected to result in the sites being suitable for unlimited use and unrestricted exposure.
- All newly selected alternatives are expected to be completed and facilitate site reuse within a year.

Distinguishing features are as follows:

- The distinguishing features of Alternative 16 are that no remedial action would take place under this alternative and that there is no cost associated with this alternative.
- The distinguishing feature of Alternative 18 is excavation. The long-term reliability of this alternative is high, because the contaminated soil is removed from the site and transported off-base for disposal at an appropriate facility. It is expected that the excavations under Alternative 18 would be planned and executed within one (1) year.

4.5.1 Site SS016

For Site SS016, the soil remedy change from Alternative 17 – Land Use and Access Restrictions to Alternative 18 – Excavation/Off-base Disposal is presented in Table 4-6. Capital costs under Alternative 18 include excavating soil contaminated with cPAHs at concentrations greater than the residential cleanup levels. The excavated soil will be transported to an off-base landfill for proper disposal. The Air Force will verify that the selected off-base landfill receiving the excavated soil is properly permitted to receive this waste and will comply with CERCLA Section 121(d)(3). Were the ROD Amendment selected alternative for Site SS016 of excavation not to achieve identified cleanup levels, Alternative 17, Land Use and Access Restrictions, will remain in place as long as soil contamination concentrations remain above levels allowing for unlimited use and unrestricted exposure; see Section 5.4.1 of the NEWIOU SSSW ROD (Travis AFB, 2006) evaluation of Alternative 17.

Alternative 18 is being completed under a performance-based contract between CH2M HILL and USACE Omaha District. Costs were estimated using institutional experience on similar sites and actual costs from subcontractors in the vicinity of Travis AFB. The removal cost estimate is $396,831, the sum total of which will be paid by the Air Force. The cost to the Air Force is fixed and inclusive of all contingencies. This estimate considers the following:

- Planning/work plans
- Excavation
- Transportation and disposal
- Travel and oversight
- Remedial action reports and documentation

Under Alternative 18, no long-term or periodic costs will be required, because following excavation, the site soils will be acceptable under a residential exposure scenario and will be available for unlimited use and unrestricted exposure.

TABLE 4-6
Common Elements and Distinguishing Features – Site SS016 OSA Area
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Element	Original ROD Alternative 17 – Land Use and Access Restrictions[a, b]	ROD Amendment Alternative 18 – Excavation/ Off-base Disposal[b]
Key ARARs	Refer to the NEWIOU SSSW ROD, Tables II-6-1 through II-6-6.	Refer to Appendix C, Tables C-1, C-2, and C-3.
Long-term reliability of remedy	Successfully demonstrated since the ROD remedy was implemented in 2003.	Reliable
Quantity of untreated waste to be disposed of offsite	None	100 yd^3
Estimated time for design and construction (years)	None	1
Estimated time to reach remediation goals (years)	> 100	1
Estimated capital cost ($)[c]	0	396,831
Estimated annual O&M cost ($)	2,400	0
Estimated total O&M present worth ($)[d]	26,407	0
Estimated periodic costs present worth ($)[e]	696	0
Estimated total cost present worth ($)	27,327	562,177
Discount rate (percent)	3.4	2.8
Number of years over which cost is projected	30	1
Use of presumptive remedies and/or innovative technologies	None	None

[a] Soil contaminants and LUCs remain in place in perpetuity.

[b] The estimated costs represent the continued implementation of the remedy selected in the NEWIOU SSSW ROD (Travis AFB, 2006) and the implementation of the changed remedy as described in this ROD Amendment.

[c] All capital costs needed to implement Alternative 17 were incurred after the ROD-selected remedy was implemented. Capital costs under Alternative 18 include those for excavating soil contaminated with cPAHs at concentrations greater than the residential cleanup level. The excavated soil will then be transported to an off-base landfill for proper disposal. This sum also includes all planning, reporting, and administrative tasks associated with completing the excavation.

[d] The current ROD requires enforcement of the soil LUCs under Alternative 17 until this requirement is removed. Long-term O&M costs under Alternative 17 include costs for conducting annual site inspections and preparation of the Site SS016 portion of the annual LUC report, which documents the enforcement status of the site LUCs.

Under Alternative 18, no long-term O&M costs will be required, because residual concentrations of cPAHs will be acceptable under a residential exposure scenario.

[e] Periodic costs under Alternative 17 are assumed to be required for maintenance or replacement of signs or placards installed as part of the LUCs. No periodic costs will be incurred under Alternative 18.

4.5.2 Site SD033

OWSs and surface soils have been removed from Site SD033 in accordance with the Corrective Action Plan for DERA-funded Oil/Water Separators (CH2M HILL, 2016) under the authority of the California State Water Resources Control Board UST Cleanup Program and have reduced risk to levels that are currently acceptable under a residential exposure scenario (CH2M HILL, 2015). Table 4-7 summarizes the key features for the soil remedy change from Alternative 17 – Land Use Controls to Alternative 16 – No Further Action.

TABLE 4-7
Common Elements and Distinguishing Features – Site SD033
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Element	Original ROD Alternative 17 – Land Use Controls[a, b]	ROD Amendment Alternative 16 – No Further Action
Key ARARs	Refer to the NEWIOU SSSW ROD, Tables II-6-1 through II-6-6.	Refer to Appendix C, Tables C-1, C-2, and C-3.
Long-term reliability of remedy	Successfully demonstrated since the ROD remedy was implemented in 2006.	Not applicable. No additional action is taken, because no soil contaminants are currently present at concentrations greater than the residential cleanup level.
Quantity of untreated waste to be disposed of offsite	None	None
Estimated time for design and construction (years)	None	None
Estimated time to reach remediation goals (years)	> 100	0
Estimated capital cost ($)[c]	0	0
Estimated annual O&M cost ($)	2,400	0
Estimated total O&M present worth ($)[d]	26,407	0
Estimated periodic costs present worth ($)[e]	696	0
Estimated total cost present worth ($)	27,327	0
Discount rate (percent)	3.4	2.8
Number of years over which cost is projected	30	0
Use of presumptive remedies and/or innovative technologies	None	None

[a] LUCs remain in place in perpetuity.

[b] The estimated costs represent the continued implementation of the remedy selected in the NEWIOU SSSW ROD (Travis AFB, 2006).

[c] All capital costs needed to implement Alternative 17 were incurred after the ROD-selected remedy was implemented. There are no capital costs required under Alternative S1, because no additional actions will be taken at the site.

[d] Currently, residual cadmium and benzo(a)pyrene concentrations are acceptable under a residential exposure scenario. However, the current ROD requires enforcement of the soil LUCs under Alternative 17 until this requirement is removed. Long-term O&M costs under Alternative 17 include costs for conducting annual site inspections and preparation of the Site SD033 portion of the annual LUC report, which documents the enforcement status of the site LUCs.

Under Alternative 16, no long-term O&M costs will be required, because residual concentrations of cadmium and benzo(a)pyrene in soil are already acceptable under a residential exposure scenario. No site inspections or reporting will be required.

[e] Periodic costs under Alternative 17 are assumed to be required for maintenance or replacement of signs or placards installed as part of the LUCs. No periodic costs will be incurred under Alternative 16, because no action is being taken.

4.6 Expected Outcomes of the Selected Remedies

Summaries of the expected outcomes of the soil remedies previously selected for Sites SS016 and SD033 in the NEWIOU SSSW ROD (Travis AFB, 2006) and the changed remedies selected in this ROD Amendment are provided in the following subsections.

4.6.1 Expected Outcomes at Site SS016

No remedial action is required at Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW, as summarized in Table 4-8.

TABLE 4-8
Expected Outcomes of Each Alternative – Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Element	Original ROD Alternative 16 – No Action	ROD Amendment Alternative 16 – No Action
Availability of land use	Unrestricted	Unrestricted
Time frame to achieve available land use (years)	0	0
Other impacts or benefits associated with alternative	No cost	No cost

At Site SS016, the main expected outcome of changing the OSA area remedy from Alternative 17 – Land Use and Access Restriction to Alternative 18 – Excavation/Off-base Disposal is removal of contaminated soil and the existing soil LUCs, because following contaminated soil removal, remaining soil will be suitable for unlimited use and unrestricted exposure. The expected outcomes are summarized in Table 4-9.

TABLE 4-9
Expected Outcomes of Each Alternative – Site SS016 OSA Area
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Element	Original ROD Alternative 17 – Land Use and Access Restrictions[a]	ROD Amendment Alternative 18 – Excavation/ Off-base Disposal[b]
Availability of land use	Restricted	Unrestricted
Time frame to achieve available land use (years)	> 100[b]	0
Other impacts or benefits associated with alternative	Low cost	Moderate cost

[a] Under Alternative 17, soil contaminants remain in place at concentrations greater than the cleanup level for the residential exposure scenario.

[b] Under Alternative 17, LUCs remain at the site in perpetuity.

4.6.2 Expected Outcomes at Site SD033

At Site SD033, the main expected outcome of changing the soil remedy from Alternative 17 – Land Use Controls to Alternative 16 – No Action for soil and sediment is removal of the existing soil LUCs, because soil is currently suitable for unlimited use and unrestricted exposure. The expected outcomes are summarized in Table 4-10.

No remedial action is required at Site SD033, because during the removal of the OWSs and surface soils in accordance with the Corrective Action Plan for DERA-funded Oil/Water Separators (CH2M HILL, 2016) under the authority of the California State Water Resources Control Board UST Cleanup Program, contaminant concentrations exceeding residential cleanup levels for benzo(a)pyrene and cadmium were removed, and therefore, no longer present at the site.

TABLE 4-10
Expected Outcomes of Each Alternative – Site SD033
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Element	Original ROD Alternative 17 – Land Use Controls	ROD Amendment Alternative 16 – No Action for Soil and Sediment
Availability of land use	Restricted	Unrestricted
Time frame to achieve available land use (years)	>100*	0
Other impacts or benefits associated with alternative	Low cost	No cost

*Under Alternative 17, unnecessary LUCs remain at the site in perpetuity.

SECTION 5

Evaluation of Alternatives

This section provides evaluations of the soil remedies originally selected in the NEWIOU SSSW ROD (Travis AFB, 2006) and the changed remedies selected in this ROD Amendment. In accordance with the NCP, the alternatives for contaminated soil at Travis AFB were evaluated using the nine (9) criteria described in Section 121(a) and (b) of CERCLA and 40 CFR 300.430(e)(9)(iii) as cited in 40 CFR 300.430(f)(5)(i).

The overall cleanup strategy for soil remedies described in this ROD Amendment is to achieve soil concentrations acceptable under a residential exposure scenario, such that soil LUCs are not required. The soil will then be available for unlimited use and unrestricted exposure to humans. In contrast, the strategy used for the remedies originally selected in the NEWIOU SSSW ROD (Travis AFB, 2006) was to achieve cleanup to an industrial worker exposure scenario and implement LUCs to protect from potential human exposure. Land use at the sites was therefore restricted.

In accordance with the NCP (Section 300.430(f)(5)(i)), the remedial alternatives were evaluated against the following nine (9) criteria:

- **Criterion 1: Overall Protection of Human Health and the Environment –** This criterion addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.
- **Criterion 2: Compliance with ARARs –** This criterion addresses whether each alternative complies with federal and state requirements that are applicable or relevant and appropriate to the remedial action. Section 121(d) of CERCLA and NCP 300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites attain ARARs, unless such ARARs are waived under CERCLA Section 121(d)4.
- **Criterion 3: Long-term Effectiveness and Permanence –** Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. This criterion includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls.
- **Criterion 4: Reduction of Toxicity, Mobility, or Volume through Treatment –** Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.
- **Criterion 5: Short-term Effectiveness –** Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community, and the environment during construction and operation of the remedy until cleanup levels are achieved.
- **Criterion 6: Implementability –** Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other government entities are also considered.
- **Criterion 7: Cost –** The cost of an alternative addresses all engineering, construction, and O&M costs incurred over the life of the project. The assessment against this criterion is based on the estimated present worth of these costs for each alternative. Present worth is used to estimate expenditures that occur over different lengths of time.

- **Criterion 8: State Acceptance –** This assessment evaluates the technical and administrative issues, concerns, and preferences the State may have regarding each of the alternatives. Resource agencies have reviewed the site documents and have agreed with the selected remedies.
- **Criterion 9: Community Acceptance –** This assessment evaluates the issues, concerns, and preferences the public may have regarding each of the alternatives.

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

5.1 Comparative Analysis of Alternatives

The original screening and detailed analysis of potential soil remedial alternatives were conducted in the NEWIOU FS Report (CH2M HILL, 1996a), and further described in the NEWIOU SSSW ROD (Travis AFB, 2006). Seven (7) potential soil remedial alternatives were evaluated using the nine (9) CERCLA criteria, and the remedy originally selected in the NEWIOU SSSW ROD (Travis AFB, 2006) to address contaminated soil at Sites SS016 and SD033 was Alternative 17 – Land Use Controls. The remedies selected for these sites in this ROD Amendment are Alternative 16 – No Action for Soil and Sediment (Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW and Site SD033) and Alternative 18 – Excavation/Off-base Disposal (Site SS016 OSA Area). The following sections describe how the previously selected soil remedy for a site in the NEWIOU SSSW ROD (Travis AFB, 2006) and the soil remedy selected in this ROD Amendment satisfy each CERCLA evaluation criterion and how those remedies compare with each other. The remedy comparisons are described in Tables 5-1 and 5-2.

TABLE 5-1
Comparative Analysis of Soil Remedies at Site SS016, OSA
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

	Soil Remedy	
Evaluation Criterion	**Original ROD[a] Alternative 17 – Land Use Controls**	**ROD Amendment[b] Alternative 18 – Excavation/Off-base Disposal**
Overall Protection of Human Health and the Environment	As stated in Sections 4.2 and 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006), Alternative 17 – Land Use Controls, is protective of human health and the environment. Enforcement of LUCs at Site SS016 has demonstrated overall protectiveness since the remedy was successfully implemented in late 2002. Use of the land at Site SS016 is encumbered by the potential risks posed by the presence of soil contamination. Potential risks are posed by contaminants in soil at concentrations acceptable under an industrial exposure scenario, but unacceptable under a residential exposure scenario. Continued enforcement of LUCs is required to manage these risks and maintain protectiveness.	The changed remedy is also protective of human health and the environment. A greater degree of overall protectiveness is achieved in comparison with Alternative 17. Soil cleanup concentrations are permanently achieved by removal of contaminated soil, instead of contaminated soil remaining at the site under long-term management. In addition, in contrast to Alternative 17, risks posed by contaminant concentrations in soil after excavation are acceptable under both industrial and residential exposure scenarios. No LUCs are required, and the site soil is available for unlimited use and unrestricted exposure.
Compliance with ARARs	As stated in Sections 4.2 and 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006), Alternative 17 – Land Use Controls complies with ARARs. The ARARs are described in Section 6.0 of the ROD. Alternative 17 has demonstrated compliance with ARARs since the remedy was successfully implemented in late 2002.	Both alternatives comply equally with ARARs. However, implementation of Alternative 18 is preferred, since it removes contaminant concentrations in soil above cleanup levels that are acceptable for residential use. No soil LUCs are required, and the site soil is available for unlimited use and unrestricted exposure. Alternative 18 provides compliance with the ARARs criterion. Soil contamination above the cleanup levels acceptable for residential use is physically removed. In contrast to Alternative 17, risks posed by contaminant concentrations in soil are acceptable under both industrial and residential exposure scenarios. No soil LUCs are required, and the site soil is available for unlimited use and unrestricted exposure. Updated descriptions of the chemical-specific, action-specific, and location-specific ARARs are provided in Appendix C of this ROD Amendment.
Long-term Effectiveness and Permanence	As stated in Sections 4.2 and 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006), Alternative 17 – Land Use Controls achieved an acceptable measure of long-term effectiveness and permanence. The LUCs enforced under Alternative 17 have been demonstrated to provide adequate and reliable protection of human health and the environment since the remedy was successfully implemented in late 2002. In terms of permanence, continued long-term enforcement of soil LUCs is required to reliably manage potential risks posed by soil contaminants remaining at the site.	In comparison to Alternative 17, Alternative 18 provides a greater degree of long-term effectiveness and permanence. Potential risks to human health posed by contaminated soil are effectively and permanently reduced to levels that are acceptable under a residential exposure scenario. Continued enforcement of soil LUCs is unnecessary. The soil LUCs are removed after excavation is completed, and the site soil is made available for unlimited use and unrestricted exposure.

TABLE 5-1
Comparative Analysis of Soil Remedies at Site SS016, OSA
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

	Soil Remedy	
Evaluation Criterion	**Original ROD[a] Alternative 17 – Land Use Controls**	**ROD Amendment[b] Alternative 18 – Excavation/Off-base Disposal**
Reduction of Toxicity, Mobility, or Volume through Treatment	Discussion of this criterion is provided in Sections 4.2 and 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006). Alternative 17 – Land Use Controls does not employ an active treatment process to reduce the toxicity, mobility, or volume of contaminants.	As with Alternative 17, Alternative 18 does not employ an active treatment process to reduce the toxicity, mobility, or volume of contaminants. Although no treatment occurs following excavation (and off-base disposal), the volume of soil contaminants at concentrations greater than residential cleanup levels is permanently reduced.
Short-term Effectiveness	As stated in Sections 4.2 and 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006), Alternative 17 – Land Use Controls provides short-term effectiveness. Human health was protected after the alternative was implemented and the LUCs enforced. There were no adverse effects to the community, workers, or environment during implementation of the remedy. Enforcement of LUCs under the remedy effectively minimized the risks posed by soil contamination. Under this remedy, soil contaminants remain in place. Use of the land at Site SS016 is encumbered by the potential risks posed by the presence of soil contamination. Potential risks are posed by contaminants in soil at concentrations acceptable under an industrial exposure scenario, but unacceptable under a residential exposure scenario. Achieving the residential soil cleanup level is not expected under this remedy. Therefore, enforcement of LUCs under Alternative 17 are required in perpetuity. Alternative 17 does not actively provide for sustainable remediation. However, implementation of the remedy results in only minimal carbon dioxide generation and energy consumption related to the routine annual inspections of the LUCs.	Potentially greater adverse effects to the community, workers, or environment are anticipated during implementation of Alternative 18 as compared to the implementation of Alternative 17. Excavation and off-base disposal of contaminated soil are expected to require from several weeks to one (1) to two (2) months depending on the complexity of the excavation and the volume of contaminated soil requiring excavation to achieve residential cleanup levels. Unlike Alternative 17, the risk posed by residual contaminant concentrations in soil is acceptable under both industrial and residential exposure scenarios following implementation of Alternative 18. No soil LUCs are required, and the site soil is available for unlimited use and unrestricted exposure.
Implementability	Discussion of the Implementability criterion is provided in Sections 4.2 and 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006). Consistent with that discussion, Alternative 17 – Land Use Controls has been demonstrated to be both technically and administratively implementable at Site SS016 after the remedy was originally selected in the ROD.	Similar to Alternative 17, Alternative 18 is also readily technically and administratively implementable. In terms of technical implementability, the excavation component of the remedy relies on readily available services and materials. Excavation is implemented using conventional and available equipment (e.g., backhoe, excavator, loaders, dump truck, and water truck). Excavation may also require the use of conventional shoring equipment (e.g., trench box) to provide sidewall soil stability. The off-base disposal component of the remedy is also readily implementable. Several off-base landfill facilities are available to receive the contaminated soil excavated from the site.

TABLE 5-1
Comparative Analysis of Soil Remedies at Site SS016, OSA
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

	Soil Remedy	
Evaluation Criterion	**Original ROD[a] Alternative 17 – Land Use Controls**	**ROD Amendment[b] Alternative 18 – Excavation/Off-base Disposal**
Cost	The current ROD remedy includes conducting an annual site inspection and preparation of a portion of an annual LUC report at an estimated annual cost of approximately $1,400. Long-term costs related to the continued enforcement of LUCs will continue in perpetuity.	Capital costs for Alternative 18 will increase over Alternative 17, because the Air Force is taking a more aggressive approach to achieving soil cleanup via excavation and off-base disposal instead of enforcing LUCs. An estimated $396,831 in capital costs will be required to implement the post-ROD changes in 2018. Under Alternative 18, no future capital costs and no long-term O&M costs will be incurred, because residential soil cleanup levels will be permanently achieved by excavation and off-base disposal. Soil LUCs are removed, and no long-term costs related to continued enforcement of LUCs are required.
State/Regulatory Agency Acceptance	As stated in Section 5.5.5 of the NEWIOU SSSW ROD (Travis AFB, 2006), the DTSC, Water Board, and EPA expressed their support for Alternative 17 when it was presented in the *North/East/West Industrial Operable Unit Proposed Plan for Soil, Sediment, and Surface Water Cleanup* (Travis AFB, 1998) and then by concurrence with the remedy selection in the NEWIOU SSSW ROD (Travis AFB, 2006).	Alternative 18 was not the proposed remedy for Site SS016 as presented in the 2015 NEWIOU Proposed Plan (Travis AFB, 2015). Instead Alternative 20 (Excavation/Treatment/Off-base Disposal) was originally proposed. However, because of the small volume of soil estimated to be excavated and potentially treated and the low soil risk, it is not cost effective to select Alternative 20. The Air Force and EPA have jointly evaluated and selected the changed soil remedy. The California DTSC and Water Board concur with the changed remedy.
Community Acceptance	As stated in Section 5.5.5 of the NEWIOU SSSW ROD (Travis AFB, 2006), the community expressed support for the selection of Alternative 17 at Site SS016 when it was presented in the *North/East/West Industrial Operable Unit Proposed Plan for Soil, Sediment, and Surface Water Cleanup* (Travis AFB, 1998). Comments received from the community on the *North/East/West Industrial Operable Unit Proposed Plan for Soil, Sediment, and Surface Water Cleanup* (Travis AFB, 1998) during July 8 through August 8, 1998, and January 16 through February 15, 2006, public comment periods are provided in Part III – Responsiveness Summary of the ROD.	The Air Forces anticipates the support from the community on the selection of Alternative 18. An explanation of a slight modification of the selected remedy is further discussed in Section 8 of this ROD Amendment.

[a] Soil remedy selected in the NEWIOU SSSW ROD (Travis AFB, 2006).
[b] The changed remedy described in this ROD Amendment is a remedy identified in the NEWIOU SSSW ROD, but not originally selected for the subject site.

TABLE 5-2
Comparative Analysis of Soil Remedies at Site SD033
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

	Soil Remedy	
Evaluation Criterion	**Original ROD[a] Alternative 17 – Land Use Controls**	**ROD Amendment[b] Alternative 16 – No Further Action**
Overall Protection of Human Health and the Environment	As stated in Sections 4.2 and 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006), Alternative 17 – Land Use Controls is protective of human health and the environment. Enforcement of LUCs at Site SD033 has demonstrated overall protectiveness since the remedy was successfully implemented in late 2006. Use of the land at Site SD033 is encumbered by the potential risks posed by the presence of soil contamination. Potential risks are posed by contaminants in soil at concentrations acceptable under an industrial exposure scenario, but unacceptable under a residential exposure scenario. Continued enforcement of LUCs is required to manage these risks and maintain protectiveness.	Alternative 16 – No Further Action is similarly protective of human health and the environment under the current conditions that exist at Site SD033. The soil cleanup levels for cadmium and benzo(a)pyrene contamination under a residential exposure scenario have already been permanently achieved by surface scrape and excavation with off-base disposal (CH2M HILL, 2018a). Therefore, continued enforcement of soil LUCs under Alternative 17 is not needed, and the LUCs are removed under Alternative 16. Soil at the site is suitable for unlimited use and unrestricted exposure.
Compliance with ARARs	As stated in Sections 4.2 and 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006), Alternative 17 – Land Use Controls complies with ARARs. The ARARs are described in Section 6.0 of the ROD. Alternative 17 has demonstrated compliance with ARARs since the remedy was successfully implemented in late 2006.	Because of the soil removal associated with the corrective action efforts for the OWSs, soil contamination above the cleanup levels established for a residential exposure scenario has been physically removed from Site SD033 (CH2M HILL, 2015). Although chemical-specific ARARs under the residential exposure scenario have been achieved, the No Action alternative (Alternative 16) does not require compliance with ARARs per OSWER guidance (EPA, 1999). Updated listings of the chemical-specific, action-specific, and location-specific ARARs are provided in Appendix C of this amendment.
Long-term Effectiveness and Permanence	As stated in Sections 4.2 and 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006), Alternative 17 – Land Use Controls achieved an acceptable measure of long-term effectiveness and permanence. The LUCs enforced under Alternative 17 have been demonstrated to provide adequate and reliable protection of human health and the environment since the remedy was successfully implemented in late 2006. In terms of permanence, continued long-term enforcement of soil LUCs is required to reliably manage potential risks posed by soil contaminants remaining at the site.	Potential risks to human health posed by cadmium- and benzo(a)pyrene-contaminated soil have already been permanently reduced to levels that are acceptable under a residential exposure scenario. Therefore, continued enforcement of soil LUCs under Alternative 17 is unnecessary. Under Alternative 16, the soil LUCs are removed. The site soil is currently available for unlimited use and unrestricted exposure.
Reduction of Toxicity, Mobility, or Volume through Treatment	Alternative 17 – Land Use Controls does not employ an active treatment process to reduce the toxicity, mobility, or volume of contaminants.	Similar to Alternative 17, Alternative 16 – No Further Action also does not employ a treatment process to reduce the toxicity, mobility, or volume of contaminants. However, the concentrations of cadmium and benzo(a)pyrene in the soil have already been reduced below the residential cleanup level by excavation and off-base landfill disposal, and no treatment process is needed.

TABLE 5-2
Comparative Analysis of Soil Remedies at Site SD033
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

	Soil Remedy	
Evaluation Criterion	**Original ROD[a] Alternative 17 – Land Use Controls**	**ROD Amendment[b] Alternative 16 – No Further Action**
Short-term Effectiveness	As stated in Sections 4.2 and 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006), Alternative 17 – Land Use Controls provided short-term effectiveness. Human health was protected after the alternative was implemented and the LUCs enforced. There were no adverse effects to the community, workers, or environment during implementation of the remedy. Enforcement of LUCs under the remedy effectively minimized the risks posed by soil contamination. Under this remedy, soil contaminants remain in place. Use of the land at Site SD033 is encumbered by the potential risks posed by the presence of soil contamination. Potential risks are posed by contaminants in soil at concentrations acceptable under an industrial exposure scenario, but unacceptable under a residential exposure scenario. Achieving the residential soil cleanup level is not expected under this remedy. Therefore, enforcement of LUCs under Alternative 17 are required in perpetuity. Alternative 17 does not actively provide for sustainable remediation. However, implementation of the remedy results in only minimal carbon dioxide generation and energy consumption related to the routine annual inspections of the LUCs.	In contrast to Alternative 17, no further remedial actions are taken under Alternative 16, and there are therefore no adverse effects to the community, workers, or environment during implementation of the alternative. Concentrations of cadmium and benzo(a)pyrene in the soil have already been reduced below the residential cleanup levels, and the site soil is currently suitable for unlimited use and unrestricted exposure.
Implementability	As stated in Sections 4.2 and 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006), Alternative 17 – Land Use Controls was determined to be implementable. Alternative 17 was demonstrated to be both technically and administratively implementable at Site SD033 after the remedy was originally selected in the ROD.	In the context of technical implementability, the soil cleanup level for cadmium and benzo(a)pyrene under a residential exposure scenario has already been permanently achieved by excavation and off-base landfill disposal. The site soil is already suitable for unlimited use and unrestricted exposure. Therefore, there are no issues related to technical implementation of the soil remedy. Administratively, selection of the No Action alternative via this ROD Amendment provides a greater degree of implementability. The LUCs enforced under Alternative 17 are no longer required at Site SD033.

TABLE 5-2
Comparative Analysis of Soil Remedies at Site SD033
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

	Soil Remedy	
Evaluation Criterion	**Original ROD[a] Alternative 17 – Land Use Controls**	**ROD Amendment[b] Alternative 16 – No Further Action**
Cost	The current ROD remedy includes conducting an annual site inspection and preparation of a portion of an annual LUC report at an estimated annual cost of approximately $1,400. Long-term costs related to the continued enforcement of LUCs will continue in perpetuity.	In contrast to Alternative 17, under Alternative 16 – No Further Action, no long-term costs are incurred. Alternative 16 does have a minor capital cost associated with the removal of LUC warning signs from the site and preparing a report to document the removal of LUCs. Because soil cleanup levels under a residential exposure scenario have already been permanently achieved, the soil LUCs required under Alternative 17 are no longer needed, and no long-term costs related to continued enforcement of LUCs are necessary.
State/Regulatory Agency Acceptance	The DTSC, Water Board, and EPA expressed their support for Alternative 17 when it was presented in the *NEWIOU Proposed Plan for Soil, Sediment, and Surface Water Cleanup* (Travis AFB, 1998) and then by concurrence with the remedy selection in the NEWIOU SSSW ROD (Travis AFB, 2006).	Alternative 16 was not the proposed remedy for Site SD033 as presented in the 2015 NEWIOU Proposed Plan (Travis AFB, 2015). Instead, Alternative 18 (excavation and landfill disposal) was originally proposed. However, as a result of removing the OWSs and surface soils (CH2M HILL, 2018a and 2018b), contaminants exceeding cleanup levels are no longer present at the site as described in Section 8.2. Thus, no additional actions are required at the site, and the site is suitable for unlimited use and unrestricted exposure. The Air Force and EPA have jointly evaluated and selected the changed soil remedy. The California DTSC and Water Board concur with the changed remedy.
Community Acceptance	The community expressed support for the selection of Alternative 17 at Site SD033 when it was presented in the *Proposed Plan for Soil Cleanup Proposed Plan for Soil, Sediment, and Surface Water Cleanup* (Travis AFB, 1998). Comments received from the community on the Proposed Plan for Soil Cleanup (Travis AFB, 1998) during July 8 through August 8, 1998, and January 16 through February 15, 2006, public comment periods are provided in Part III – Responsiveness Summary of the ROD.	The Air Force anticipates the support from the community on the selection of Alternative 16. An explanation of the slightly modified approach to the implementation of the selected remedy is further discussed in Section 8 of this ROD Amendment.

[a] Soil remedy selected in the NEWIOU SSSW ROD (Travis AFB, 2006).
[b] The Alternative 16 presented in this ROD Amendment is a remedy identified in the NEWIOU SSSW ROD, but not originally selected for the subject site.

Note:

OSWER = Office of Solid Waste and Emergency Response

5.1.1 Summary of Comparative Analyses

This section summarizes the comparative analyses of alternatives with respect to the CERCLA evaluation criteria. The overall ranking of alternatives varies by site upon consideration of numerous factors within the balancing criteria, including the level of existing risk to human health, current and future land use, and incremental cost (i.e., the cost difference between alternatives). Graphical depictions of the comparative alternative performance at Sites SS016 and SD033 based on the evaluation criteria are shown in Tables 5-3 and 5-4.

5.1.1.1 Overall Protection of Human Health and the Environment

As described in Section 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006), Alternatives 17 and 18 meet the threshold criterion of Overall Protection of Human Health and the Environment at Site SS016.

For Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, and the SSRW, contaminant concentrations in these areas of Site SS016 do not pose a potential human health risk. For the Site SS016 OSA Area, Alternative 18 provides a greater degree of overall protectiveness than Alternative 17, because contaminants are physically removed from the site instead of being left in place and LUCs enforced.

For Site SD033, contaminant concentrations already meet the residential soil cleanup level.

5.1.1.2 Compliance with ARARs

Alternatives 17 and 18 also meet the threshold criterion of Compliance with ARARs, as stated in Section 4.3 of the NEWIOU SSSW ROD (Travis AFB, 2006).

For Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, and the SSRW, contaminant concentrations in these areas of Site SS016 do not pose a potential human health risk. For the current existing site conditions, Alternatives 17 and 18 are not applicable to these areas of Site SS016.

For Site SS016 OSA Area, Alternative 18 is preferred because soil contaminants are physically removed from the site, and residual concentrations of soil contaminants are below residential cleanup levels.

For Site SD033, contaminant concentrations already meet the residential soil cleanup levels. Alternatives 17 and 18 are also not applicable to Site SD033 as a result of the current existing site conditions.

5.1.1.3 Long-term Effectiveness and Permanence

For the Site SS016 OSA Area, Alternative 18 provides a greater degree of long-term effectiveness and permanence than Alternative 17, because soil contaminants are effectively and permanently removed instead of being left in place and LUCs enforced in perpetuity.

For Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, and the SSRW, soil concentrations in these areas of Site SS016 do not pose a potential human health risk. For the current existing site conditions, Alternatives 17 and 18 are not applicable to these areas of Site SS016.

For Site SD033, contaminant concentrations already meet the residential cleanup levels for soil.

5.1.1.4 Reduction of Toxicity, Mobility, and Volume through Treatment

For Sites SS016 and SD033, no reduction of toxicity, mobility, and volume through treatment occurs under Alternative 17 or 18.

For Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, and the SSRW, contaminant concentrations in these areas of Site SS016 do not pose a potential human health risk. For the current existing site conditions, Alternatives 17 and 18 are not applicable to these areas of Site SS016.

For Site SD033, contaminant concentrations already meet the residential soil cleanup levels.

5.1.1.5 Short-term Effectiveness

Continued enforcement of existing LUCs under Alternative 17 best satisfies this criterion at the Site SS016 OSA Area. Continuation of land use and access restrictions under Alternative 17 poses the fewest potential adverse effects to the community, workers, and the environment during implementation of the remedy in comparison to Alternative 18.

For Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, and the SSRW, contaminant concentrations in these areas of Site SS016 do not pose a potential human health risk. For the current existing site conditions, Alternatives 17 and 18 are not applicable to these areas of Site SS016.

For Site SD033, contaminant concentrations already meet the residential soil cleanup levels.

5.1.1.6 Implementability

The criterion of implementability includes consideration of the technical implementability and administrative feasibility of the remedial alternatives at each site.

Technical Implementability. At Site SS016, the continuation of existing LUCs under Alternative 17 is the most technically implementable alternative. Excavation and off-base disposal of contaminated soil under Alternative 18 poses more technical implementability issues than does the continuation of existing LUCs under Alternative 17. Although coordination for site mobilization (including contractor selection, equipment availability, site controls, and field screening procedures) and soil disposal will be necessary under Alternative 18, excavation and off-base disposal of contaminated soil is an implementable alternative.

For Site SD033, the continuation of LUCs under Alternative 17 is not necessary, since soil concentrations at Site SD033 already meet residential soil cleanup levels. Therefore, Alternative 16 (No Further Action) will be implemented. There are no issues related to technical implementation of the soil remedy.

Administrative Feasibility. In terms of administrative feasibility, Alternative 18 has a greater degree of implementability than continuation of LUCs under Alternative 17. Implementation of Alternative 18 at Site SS016 will result in contaminant concentrations that allow for unlimited use of and unrestricted exposure to the soil. In comparison, continuation of land use and access restrictions under Alternative 17 will be required in perpetuity and use of the soil at the sites will be permanently encumbered.

In recent years, the Air Force has taken steps toward reducing its environmental liability by remediating sites to residential cleanup levels. It is highly likely that these sites will remain industrial in nature for the foreseeable future. As long as the industrial work at these sites does not change, LUCs are effective and inexpensive, and Alternative 17 remains implementable. However, the activities at Travis AFB have changed in the past to adapt to new global military mission requirements. This trend is expected to continue as the Base continues to take on new responsibilities. Therefore, Base decision-makers have decided to remediate sites with restricted land use and access restrictions to residential cleanup levels to allow more flexibility for new construction and new land use activities.

5.1.1.7 Cost

At Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, and the SSRW, cleanup levels under a residential exposure scenario have satisfied requirements so that no further actions will be taken. In comparison, no capital costs will be incurred under Alternative 17.

At the Site SS016 OSA Area, Alternative 17 best satisfies the cost criterion. Continued enforcement of land use and access restrictions under Alternative 17 has lower costs in comparison to Alternative 18. Under Alternative 17, no capital costs will be incurred, but long-term O&M costs will be incurred in perpetuity. Conversely, Alternative 18 will have capital costs, but no O&M costs will be incurred.
At Site SD033, soil cleanup levels under a residential exposure scenario have already been permanently achieved, and no further actions will be taken. In comparison, no capital costs will be incurred under Alternative 17, but long-term O&M costs related to continued enforcement of LUCs will be incurred in perpetuity.

The primary reason for originally selecting soil LUCs for these sites was cost. It was much less expensive to restrict access to these sites than to excavate the contaminated soil and transport it to an off-base landfill. However, after years of enforcing LUCs at Site SS016 as well as other soil and groundwater sites, it became obvious that the long-term costs of continuing LUCs at an active military installation are greater than the short-term expense of excavation and disposal.

In general, Alternative 18 is likely the highest ranking (i.e., most preferable) alternative relative to the original alternative, because it is most protective and is most effective long-term. Detailed cost tables are provided in Appendix D.

TABLE 5-3
Summary of Comparative Analysis Alternatives – Site SS016
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Criterion	Alternative 17 – Land Use Controls	Alternative 18 – Excavation/Off-base Disposal
Overall Protection of Human Health and the Environment	◐	●
Compliance with ARARs	●	●
Long-term Effectiveness and Permanence	◐	●
Reduction of Toxicity, Mobility, and Volume through Treatment	O	O
Short-term Effectiveness	●	◐
Implementability	◐	●
Cost	●	◐

Notes:

● = Alternative satisfies the criterion.
◐ = Alternative moderately satisfies the criterion.
O = Alternative not applicable or does not satisfy the criterion.

TABLE 5-4
Summary of Comparative Analysis Alternatives – Site SD033
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California

Criterion	Alternative 17 – Land Use and Access Restrictions	Alternative 16 – No Further Action
Overall Protection of Human Health and the Environment	◐	●
Compliance with ARARs	●	●
Long-term Effectiveness and Permanence	◐	●
Reduction of Toxicity, Mobility, and Volume through Treatment	○	○
Short-term Effectiveness	●	●
Implementability	◐	●
Cost	●	●

Notes:

● = Alternative satisfies the criterion.
◐ = Alternative moderately satisfies the criterion.
○ = Alternative not applicable or does not satisfy the criterion.

SECTION 6

Support Agencies Comments

This ROD Amendment has been prepared in consultation and concurrence with EPA and the State of California. Comments provided by the regulatory agencies were addressed by Travis AFB prior to the issuance of the Final ROD Amendment. Response to comments developed by Travis AFB are provided in Appendix E.

SECTION 7

Statutory Determinations

This section describes how the changed remedies selected in this ROD Amendment satisfy the statutory requirements of CERCLA Section 121 (as required by 40 CFR 300.430[f][5][ii]). These requirements include the following:

- Protection of human health and the environment
- Compliance with ARARs
- Cost-effectiveness
- Utilization of permanent solutions and alternative treatment technologies or resource recovery technologies to maximum extent practicable
- Satisfying the preference for treatment as a principal element of the remedy
- Conducting five (5)-year reviews

7.1 Protection of Human Health and the Environment

Protection of human health and the environment for the sites in this ROD Amendment will be achieved by eliminating exposure to contaminants by cleaning up to levels acceptable for unlimited use and unrestricted exposure (Table 4-1). Under Alternative 18, contaminated soil at concentrations greater than residential use cleanup levels will be excavated and disposed of offsite, thereby eliminating any potential for direct exposure and improving overall protectiveness. Although no action is being taken at Site SD033 under Alternative 16, current site conditions are protective of human health and the environment as a result of removing the OWSs and surface soils (CH2M HILL, 2018a and 2018b). The following remedies selected in this ROD Amendment are protective of human health and the environment:

- **Site SS016, OSA Area** – Excavation will be combined with off-base disposal under Alternative 18 to permanently achieve protectiveness. However, in the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency.
- **Site SS016, Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW –** No action is required as evaluations performed in the *Human Health Risk Assessment Update Technical Memorandum, Site SS016* (CH2M HILL, 2017) determined that soil contamination in these areas of Site SS016 does not pose a potential human health risk for residential land use. This ROD Amendment does not modify the existing no action remedy for Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW.
- **Site SD033 –** No further remedial action is required at this site. PAH and cadmium contaminated surface soil and the OWS at the site had been previously excavated while conducting the OWS corrective action and disposed of at an off-base landfill. The risk assessment associated with the 2016 data gap investigation concluded that Site SD033 does not pose a potential human health risk under the residential land use scenario.

7.2 Compliance with ARARs

The selected soil remedy (Alternative 18 – Excavation) for Site SS016 is expected to achieve cleanup levels that permit unlimited use and unrestricted exposure (UU/UE) based on risk-based values for protecting human health and the environment. Alternative 18 is considered compliant with ARARs.[1] In the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency.

Site SD033 already meets remedial action objectives since it contains chemicals at concentrations that have been determined to be acceptable for protecting human health and the environment, and is acceptable for unlimited use and unrestricted exposure. Thus, ARARs do not apply.

Overall soil ARARs are provided in Appendix C.

7.3 Cost Effectiveness

Overall cost effectiveness is determined by evaluating long-term effectiveness and permanence; reduction in toxicity, mobility, and volume; and short-term effectiveness (Balancing Criteria 3, 4, and 5). The overall effectiveness of the remedy is then compared to the cost for the remedy. The selected remedy for Site SS016 (Alternative 18 – Excavation) is cost-effective and represents a reasonable value for the money to be spent. The cost of the remedy is judged to be proportional to its overall effectiveness.

Under Alternative 16 – No Further Action, no capital costs or long-term costs are incurred at Site SD033, because soil, sediment, and surface water cleanup levels under a residential exposure scenario have already been permanently achieved.

Although CERCLA does not require that the most cost-effective remedy be chosen, the most cost-effective remedy is often selected. The remedy costs are summarized in Appendix D.

7.4 Utilization of Permanent Solutions and Alternative Treatment Technologies

The selected remedies utilize, to the maximum extent practicable, permanent solutions to the potential threats posed by soil contamination at each site:

- **Site SS016, OSA Area –** Excavation will be combined with off-base landfill disposal under Alternative 18 to permanently achieve protectiveness.
- **Site SS016, Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW –** No action is required as evaluations performed in the *Human Health Risk Assessment Update Technical Memorandum, Site SS016* (CH2M HILL, 2017) determined that soil contamination in these areas of Site SS016 does not pose a potential human health risk for residential land use.
- **Site SD033 –** Soil contamination was previously removed by excavation and transported off-base for landfill disposal, and no further actions are necessary.

[1] DTSC and the Air Force disagree whether California's Toxicity Criteria Rule (Title 22, CCR Sections 68400.5, 69020, 69021, and 69022) is an ARAR and will pursue resolution of that disagreement as part of a pending dispute at another location. Use of California toxicity values for two chemicals to show achievement of UU/UE at this site will not affect either DTSC's or the Air Force's respective positions on California's Toxicity Criteria Rule in any other context or in any dispute resolution process.

The selected remedy (Alternative 18) for Site SS016 includes a permanent solution, excavation and off-base disposal. Treatment is not a component under Alternative 18. Alternative 18 is selected as the remedy for Site SS016, because treatment could not be cost-effectively applied considering the relatively low risks. The excavated soil volume also will be minimal, and therefore, not cost effective to treat.

7.5 Preference for Treatment as a Principal Element

The EPA prefers alternatives that use treatment to clean contaminated soil. However, no treatment processes are utilized in the selected remedy at Site SS016 because of the low volume of soil to dispose of, making treatment impracticable and not cost-effective. Toxicity, mobility, and volume would effectively be reduced at Site SS016 upon excavation, but not through treatment. Thus, the statutory preference for treatment as a principal element will not be met through Alternative 18, and the selected remedy does not satisfy the statutory preference for treatment as a principal element of the site remedy.

No treatment processes are utilized in the selected remedy (Alternative 16) at Site SD033, because no further action is required at the site. Thus, the statutory preference for treatment as a principal element will not be met through Alternative 16, and the selected remedy does not satisfy the statutory preference for treatment as a principal element of the site remedy.

Section 8 provides further details on the preferred remedial action selected for Sites SS016 and SD033, including the rationale for not selecting a treatment technology for these sites.

7.6 Five (5)-year Reviews

Because these remedies are expected to be completed in less than five (5) years and will not result in hazardous substances remaining onsite at concentrations greater than levels that allow for unlimited use and unrestricted exposure, the next scheduled five (5)-year review will document the actions taken to achieve unlimited use and unrestricted exposure at the sites addressed in this ROD Amendment. Thus, subsequent five (5)-year reviews will not be required for the specific sites covered in this ROD Amendment. However, if unlimited use and unrestricted exposure status is not achieved within five (5) years of the date the ROD Amendment is signed, then five (5)-year reviews will be completed in accordance with CERCLA and will evaluate the remedy status to verify that the remedy will be protective of human health and the environment.

SECTION 8

Documentation of Significant Changes

There have been two (2) changes to the selected remedies since the Air Force submitted the 2015 NEWIOU Proposed Plan (Travis AFB, 2015) for public comment on April 15, 2015.

8.1 Oil Spill Area; Facilities 11, 13/14, 20, 42/1941, and 139/144; and Storm Sewer Right-of-Way (Site SS016)

The first change involves the OSA (Site SS016). The 2015 NEWIOU Proposed Plan considered Alternative 20 – Excavation, Ex Situ High Temperature Thermal Treatment, and Disposal at Landfill to be the preferred remedial alternative for Site SS016, based on the EPA preference for treatment to clean contaminated soil. The Proposed Plan based the alternative preference on the use of a promising thermal treatment technology, known as Vapor Energy Generator (VEG) technology. This technology uses high efficiency steam from a generator to strip organic contaminants from the soil, creating a vapor that is returned to the generator as additional fuel. Because the treated soil can be placed back into the excavation void, it was considered to be a cost-effective way to treat large volumes of hydrocarbon-contaminated soil.

Over the following three (3) years, the VEG technology has been successfully applied to many challenging contaminated sites and has become so popular that the scheduling of available VEG units has become difficult. In addition, the cost effectiveness of this technology was based on the total amount of PAH-contaminated soil on Travis AFB that required remediation. Along with the Site SS016 soil, there was also a considerable amount of PAH-contaminated soil from the Old Skeet Range (Site TS060), located on the western side of the Base. The Old Skeet Range is managed under the Military Munitions Response Program (MMRP), a sister program to the ERP. The cleanup of the Old Skeet Range was to be conducted as a removal action and followed a different schedule. Both ERP and MMRP actions were managed under a Performance-based Contract, and it was believed when the 2015 NEWIOU Proposed Plan was issued that the two (2) actions could be conducted during the same construction period, allowing all work to be done in one (1) field team mobilization and using the same cost-effective technology.

Because the Travis AFB ISS could not proceed with the Site SS016 soil remediation until this amendment to the NEWIOU SSSW ROD was finalized, it could not carry out the cleanup of both sites in one (1) mobilization, so the original preferred remedial alternative became cost prohibitive. As a result of the unavailability of the VEG technology, the Travis AFB ISS decided to proceed with a Site TS060 removal action that consisted of the excavation of contaminated soil and its transportation to an appropriate off-base landfill for disposal in 2017. The *Site TS060 Removal Action Completion Report* (CH2M HILL, 2018) describes the excavation and disposal of lead- and PAH-contaminated soil and the achievement of residential cleanup levels. Since the treatment of the relatively small volume of contaminated soil at Site SS016 with other types of thermal technologies would be cost prohibitive, the Air Force revised its preferred alternative from Alternative 20 – Excavation, Ex Situ High Temperature Thermal Treatment, and Disposal at Landfill to Alternative 18 – Excavation and Landfill Disposal. The benefit of this remedy change is that the Air Force would have had to transport post-treatment soil to a landfill if any non-treatable contaminants (such as metals) above risk-based standards are discovered during confirmation sample analysis or waste profiling. Considering the highly industrialized activity that has taken place on the Site SS016 soil footprint, Alternative 18 is a safer alternative.

Alternative 18 uses the same excavation methods as Alternative 20 and will still attain the residential cleanup levels necessary to achieve the desired unlimited use and unrestricted exposure status, allowing the Base to use this property to support the Travis AFB mission. Were the ROD Amendment selected alternative for SS016 of excavation not to achieve identified cleanup levels, Alternative 17, Land Use and Access Restrictions, will remain in place as long as soil contamination concentrations remain above levels allowing for unlimited use and unrestricted exposure; see Section 5.4.1 of the NEWIOU SSSW ROD (Travis AFB, 2006) evaluation of Alternative 17. Currently, the Air Force is designing a new KC-46 hangar that will cover most of the Site SS016 soil footprint when constructed. As a result, site restoration after the completion of the surface soil excavation will be minimal, which will improve the cost effectiveness of the remedy.

8.2 West Branch of Union Creek, Parts of SS II, Facilities 810 and 1917, South Gate Area, and Outfall II (Site SD033)

The second change involves Site SD033, specifically the portion of the site near Facility 810. The 2015 NEWIOU Proposed Plan considered Alternative 18 – Excavation and Landfill Disposal to be the preferred remedial alternative for Site SD033, since there is no cost-effective treatment technology that can clean a small volume of soil with both cadmium and benzo(a)pyrene contamination to residential cleanup levels.

During the period between the publishing of the 2015 NEWIOU Proposed Plan and this ROD Amendment, the Travis AFB ISS proceeded to investigate and decommission a number of old OWSs under its POCO Sites program. This program focuses on the investigation and cleanup of petroleum sites that do not have any CERCLA contamination and receives regulatory oversight from the Water Board.

Within Site SD033 at Facility 810, there were two (2) OWSs that were removed in areas that were contaminated with benzo(a)pyrene and/or cadmium. One (1) OWS (OW052) was located on the east side of Facility 810, near cadmium-contaminated soil associated with Site SD033. The second OWS (OW057) was located on the west side of Building 810 near the cadmium- and benzo(a)pyrene-contaminated soil associated with Site SD033. OW052 and OW057 were decommissioned in accordance with the *Corrective Action Plan for DERA-funded Oil/Water Separators* (CH2M HILL, 2016). In conjunction with the decommissioning of the OWSs, cadmium-contaminated soil, located near the OWSs, were excavated and removed. Confirmation soil samples were collected from the areas of excavation, and all petroleum- and nearly all metals-contaminated soil was removed (CH2M HILL, 2018b).

Afterwards, an updated risk assessment that was conducted as part of the 2016 data gap investigation, using the results of the data gap investigation in conjunction with the OWS confirmation samples, identified no unacceptable risk from soil contaminants at Site SD033. This new data demonstrated that the proposed excavation remedy under Alternative 18 as described in the 2015 NEWIOU Proposed Plan is no longer necessary, because the soil contaminant concentrations at Site SD033 had been reduced during the OWS removal to allow for unlimited use and unrestricted exposure. The *Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046* (CH2M HILL, 2018a) describes the collection and analysis of surface soil samples that led to the reevaluation of site conditions. As a result of this reevaluation, the Air Force selected Alternative 16 – No Further Action as the soil remedy for Site SD033 under this ROD Amendment. Alternative 16 is an appropriate remedy selection for Site SD033, since the intent of the original soil remedy had already been carried out under an unrelated POCO action.

SECTION 9

Public Participation Compliance

Public participation requirements set out in NCP 300.435(c)(2)(ii) have been met. This ROD Amendment will become part of the Travis AFB Administrative Record file in accordance with NCP Section 300.825(a)(2).

Advertisements for the 2015 NEWIOU Proposed Plan (Travis AFB, 2015) and public meeting were published in the Travis AFB *Guardian* newsletter issued on April 6, 2015.

A public notice of availability and a brief description of the 2015 NEWIOU Proposed Plan (Travis AFB, 2015) were published in the Fairfield *Daily Republic* and *Vacaville Reporter*, newspapers of general circulation on April 14, 2015. The 2015 NEWIOU Proposed Plan was also made available for public review at the Vacaville Cultural Center Library at 1020 Ulatis Drive in Vacaville, California (95687) during the hours of 10:00 a.m. to 9:00 p.m. Monday through Thursday, Friday and Saturday from 10:00 a.m. to 5:00 p.m., and Sunday from 1:00 to 5:00 p.m.

The public comment period for the 2015 NEWIOU Proposed Plan (Travis AFB, 2015) was from April 15 to May 15, 2015. A public meeting was also held on April 23, 2015, at the Northern Solano County Association of Realtors building located at 3690 Hilborn Road, Fairfield, California (94535).

Travis AFB received no comments on the 2015 NEWIOU Proposed Plan (Travis AFB, 2015) during the April 15 to May 15, 2015, public comment period. During the public meeting on April 23, 2015, no written or verbal comments were received regarding clarification of the changed alternatives described therein.

Appendix A
Acronyms and Abbreviations

APPENDIX A

Acronyms and Abbreviations

AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
Air Force	U.S. Air Force
ARAR	applicable or relevant and appropriate requirement
AST	aboveground storage tank
bgs	below ground surface
Cal/EPA	California Environmental Protection Agency
CDI	chronic daily intake
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CHHSL	California Human Health Screening Level
COC	chemical of concern
COEC	chemical of ecological concern
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSF	cancer slope factor
CTV	critical toxicity value
DERP	Defense Environmental Restoration Program
DoD	U.S. Department of Defense
DTSC	California Department of Toxic Substances Control
EIOU	East Industrial Operable Unit
ELCR	excess lifetime cancer risk
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ERA	ecological risk assessment
ERP	Environmental Restoration Program
ESD	Explanation of Significant Differences
ESL	environmental screening level
FFA	Federal Facility Agreement
FS	feasibility study

HHRA	human health risk assessment
HI	hazard index
HQ	hazard quotient
IRIS	Integrated Risk Information System
IRP	Installation Restoration Program
ISS	Installation Support Section
ITSI	Innovative Technical Solutions, Inc.
J	estimated concentration
J-	estimated concentration, biased low
LUC	land use control
mg/kg	milligram(s) per kilogram
mg/kg-day	milligram(s) per kilogram per day
MMRP	Military Munitions Response Program
NA	not applicable; not available
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEWIOU	North/East/West Industrial Operable Unit
O&M	operation and maintenance
OEHHA	Office of Environmental Health Hazard Assessment
OSA	Oil Spill Area
OSWER	Office of Solid Waste and Emergency Response
OU	operable unit
OWS	oil/water separator
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
POCO	petroleum-only contaminated
RAO	remedial action objective
RBSL	risk-based screening level
RfD	reference dose
RI	remedial investigation
RME	reasonable maximum exposure
ROD	record of decision
RSL	regional screening level
RTV	reference toxicity value
SARA	Superfund Amendments and Reauthorization Act

SS II	Storm Sewer II
SSRW	storm sewer right-of-way
SSSW	soil, sediment, and surface water
SVE	soil vapor extraction
TCE	trichloroethene
TPH	total petroleum hydrocarbons
TPH-D	total petroleum hydrocarbons as diesel
TPH-E	total petroleum hydrocarbons extractable
TPH-G	total petroleum hydrocarbons as gasoline
TPH-P	total petroleum hydrocarbons purgeable
UCL	upper confidence limit
USC	U.S. Code
UST	underground storage tank
VEG	Vapor Energy Generator
VOC	volatile organic compound
WABOU	West/Annexes/Basewide Operable Unit
Water Board	San Francisco Bay Regional Water Quality Control Board
Weston	Roy F. Weston, Inc.
WIOU	West Industrial Operable Unit
yd^3	cubic yard(s)

Appendix B
References

APPENDIX B

References

CH2M HILL. 2018a *Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046*. Prepared for Travis Air Force Base, California. Final. February.

CH2M HILL. 2018b. *POCO Evaluation/Closure Report for DERA-funded Oil/Water Separators OW040, OW047, OW048, OW049, OW050, OW052, OW055, OW056, and OW057.* Prepared for Travis Air Force Base, California. Final. May.

CH2M HILL. 2018c. *Data Gap Investigation Results Technical Memorandum for Soil Site SS016*. Prepared for Travis Air Force Base, California. Final. June.

CH2M HILL. 2016. *Data Gap Investigation Work Plan Technical Memorandum for Soil Sites SD033, SD043, and SS046*. Prepared for Travis Air Force Base, California. Final. May.

CH2M HILL. 2016. *Corrective Action Plan for DERA-funded Oil/Water Separators.* Prepared for Travis Air Force Base, California. Final. July.

CH2M HILL. 2015. *POCO Investigation Work Plan for Oil/Water Separators OW040, OW047, OW048, OW049, OW050, OW051, OW052, OW053, OW054, OW055, OW056, and OW057.* Prepared for Travis Air Force Base, California. Final. April.

CH2M HILL. 1997. *West/Annexes/Basewide Operable Unit (WABOU) Remedial Investigation Report*. Volumes 1-4. Prepared for Travis Air Force Base, California. Final. May.

Innovative Technical Solutions, Inc. (ITSI). 2010. *Sites SD001 and SD033 Remedial Action Report*. Prepared for Travis Air Force Base, California. Final. July.

Office of Environmental Health Hazard Assessment (OEHHA). 2009. Revised Human Health Screening Levels for Lead. Integrated Risk Assessment Branch. September.

Radian. 1996a. *Remedial Investigation, West Industrial Operable Unit, Travis Air Force Base, California.* Final. February.

Radian. 1996b. *North/East/West Industrial Operable Unit Feasibility Study, Travis Air Force Base, California.* September.

Radian. 1995. *Remedial Investigation, North Operable Unit, Travis Air Force Base, California.* Final. July.

Roy F. Weston, Inc. [Weston]. 1995. *Remedial Investigation Report, East Industrial Operable Unit, Travis AFB, California.* Final. October.

San Francisco Bay Regional Water Quality Control Board (Water Board). 2016. *Tier 1 Environmental Screening Levels.* December.

Travis Air Force Base. 2015. *Proposed Plan for the North/East/West Industrial Operable Unit (NEWIOU) Soil, Sediment, and Surface Water ROD Amendment*. Environmental Restoration Program. 60th Air Mobility Wing. Final. April.

Travis Air Force Base. 2014. *Groundwater Record of Decision*. Travis Air Force Base, California. Final. June.

Travis Air Force Base. 2006. *Soil, Sediment, and Surface Water Record of Decision for the North/East/West Industrial Operable Unit.* Installation Restoration Program. Travis Air Force Base, California. Final. May.

Travis Air Force Base. 1998. *North/East/West Industrial Operable Unit Proposed Plan for Soil, Sediment, and Surface Water Cleanup*. Installation Restoration Program. Travis Air Force Base, California. Final. June.

U.S. Environmental Protection Agency (EPA). 2018. *Regional Screening Levels Table*. https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2018. May.

U.S. Environmental Protection Agency (EPA). 2017a. Regional Screening Level Calculator. https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search. Accessed March 16, 2017.

U.S. Environmental Protection Agency (EPA). 2017b. Integrated Risk Information System (IRIS). https://www.epa.gov/iris. Accessed June 2017.

U.S. Environmental Protection Agency (EPA). 2016. *ProUCL Version 5.1: Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations.* June.

U.S. Environmental Protection Agency (EPA). 1999. *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents.* EPA 540-R-98-031. OSWER 9200-1-23P. PB98-963241.

URS. 2005. *Ecological Technical Memorandum for the NEWIOU at Travis Air Force Base, California.* Final. September.

Appendix C
Summary of ARARs

TABLE C-1
Travis Air Force Base NEWIOU SSSW Sites – Waste Characterization, Classification, and Management ARARs
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California – Summary of ARARs

Citation	Section	ARAR Determination	ARAR Type	Description	Remarks	Sites and Alternatives
Soil Characterization						
22 CCR 66261.3(a)(2) (A) through (F)	20090(d)	Applicable	Action-specific	Provides specifications for determining whether a waste is a hazardous waste.	Excavated soil must be characterized for disposal.	Site SS016: 18 – Excavation/Offsite Disposal
Waste Classification						
RCRA Hazardous Waste Determination Title 22 CCR, Division 4.5, Chapter 11, Articles 3 and 4		Applicable	Action-specific	A hazardous waste is considered a RCRA hazardous waste if it exhibits any of the characteristics of ignitability, corrosivity, reactivity, or toxicity or if it is listed as a hazardous waste. Most waste determinations will focus on whether the generated waste (e.g., contaminated soil and treatment residuals) could be classified as toxicity-characteristic waste as defined by the contaminant concentrations.	Wastes generated during remediation must be characterized and managed in accordance with RCRA requirements. Historical information indicates that contamination at this site is not caused by listed hazardous waste. Generator knowledge and analytical testing will be used to determine the waste classification of the excavated soil.	Site SS016: 18 – Excavation/Offsite Disposal
22 CCR 66261.100 and 66261.101 (a)(1) and (a)(2)		Applicable	Action-specific	Provides specifications for determining whether a waste is a RCRA hazardous or RCRA nonhazardous waste.	Historical information indicates that contamination at this site is not caused by listed hazardous waste. Wastes generated during remediation must be characterized and managed in accordance with RCRA requirements. Generator knowledge and analytical testing will be used to determine the waste classification of the excavated soil.	Site SS016: 18 – Excavation/Offsite Disposal
22 CCR 66262.11		Applicable	Action-specific	Requires waste generators to determine if wastes are hazardous and establishes procedures for such determinations.	Wastes generated during remediation must be characterized and managed in accordance with RCRA requirements. Generator knowledge and analytical testing will be used to determine the waste classification of the excavated soil.	Site SS016: 18 – Excavation/Offsite Disposal
Waste Management						
22 CCR 66262.34		Applicable	Action-specific	Defines accumulation times for onsite storage of RCRA hazardous waste.	Wastes generated during remediation must be managed in accordance with RCRA requirements.	Site SS016: 18 – Excavation/Offsite Disposal
40 CFR 264.554(d)		Applicable	Action-specific	Defines the staging pile requirements, standards, and design criteria.	Wastes generated during remediation are allowed to be temporarily stored before and/or after treatment.	Site SS016: 18 – Excavation/Offsite Disposal
22 CCR 66264.171 through 66264.175, 66264.177, 66264.178 – Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities		Relevant and Appropriate	Action-specific	Sets standards and establishes requirements for containers holding hazardous waste for chemicals recovered from sediments, surface soils, or groundwater.	Containers will be used to transfer and store wastes generated from remedial actions.	Site SS016: 18 – Excavation/Offsite Disposal
Land Use Controls						
22 CCR 67391.1 (a)(1), (a)(2), (d), (e)(1), (e)(2), (f) and (i)		Relevant and Appropriate	Action-specific	Imposes appropriate limitations (except as provided in Section 67391.1(e)(2) and (f)) on land use when hazardous materials, hazardous wastes or constituents, or hazardous substances will remain at the property at levels that are not suitable for unrestricted use of the land.	EPA Region 9 and the Air Force consider the following portions of California Code of Regulations, Title 22, Section 67391.1 to be relevant and appropriate for this ROD Amendment: (a)(1), (a)(2), (d), (e)(1) and (e)(2), and in appropriate circumstances, sub-sections (f) (when it is not feasible to establish LUCs as a component of a remedy for a site) and (i) (definitions). These requirements are ARARs for the LUCs. DTSC's position is that all of the state regulation is an ARAR.	Site SS016: 17 – Land Use Controls

TABLE C-1
Travis Air Force Base NEWIOU SSSW Sites – Waste Characterization, Classification, and Management ARARs
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California – Summary of ARARs

Citation	Section	ARAR Determination	ARAR Type	Description	Remarks	Sites and Alternatives
Land Use Covenants	California Civil Code 1471(a)	Relevant and Appropriate	Action-specific	Provides conditions for land use restrictions to run with the land and bind successive owners.	**Joint AF and State comments:** Civil Code §1471(a) is a potential ARAR for the scope of land use controls described in the ROD that would apply to a nonfederal transferee of a site that does not allow for unrestricted use. **AF comments:** Civil Code §1471(b)-(d) is not a potential ARAR because it does not address the responsibilities of AF. Civil Code §1471(b)-(d) addresses the extent to which land use covenants are binding on transferees and their successors.	Site SS016: 17 – Land Use Controls

*California statutes and regulations comprising the federally authorized RCRA program are found in 22 CCR 66250 through 66279 and 67100 through 67800.5.

Notes:

ARAR = applicable or relevant and appropriate requirement
CCR = California Code of Regulations
NEWIOU = North/East/West Industrial Operable Unit
RCRA = Resource Conservation and Recovery Act
ROD = record of decision
SSSW = soil, sediment, and surface water

TABLE C-2
Travis Air Force Base NEWIOU SSSW Sites – Water ARARs
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California – Summary of ARARs

Source	Citation	ARAR Determination	ARAR Type	Description	Remarks	Sites and Alternatives
NPDES Discharges of Storm Water from Construction	40 CFR 122, 123, and 124, implemented in California by SWRCB Order 2009-0009-DWQ as amended by 2010-0014-DWQ, and 2012-0006-DWQ, Construction General Permit	To-be-considered	Action-specific	Regulates pollutants in discharge of stormwater associated with construction activity (clearing, grading, or excavation) involving the disturbance of 1 acre or more. Requires the preparation of a stormwater pollution prevention plan, implementation of BMPs to minimize the effects of disturbed soil on stormwater, and monitoring of stormwater to demonstrate compliance.	Permits are not ARARs because they are considered "administrative" in nature, and ARARs are substantive requirements, per CERCLA Section 121(d) and EPA guidance. On the other hand, the numerical limits that a permittee has to follow are considered "substantive" and must be complied with. In addition, ERCLA sites are exempt from obtaining permits for remediation activities conducted entirely onsite by CERCLA Section 121(e)(1). Total area disturbed between the two excavation areas is expected to be less than 1 acre. The Air Force will meet the substantive requirements of the Permit by using BMPs to minimize the potential impact on stormwater from the excavation.	Site SS016: 18 – Excavation/Offsite Disposal
NPDES General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s)	SWRCB Order No. 2013-0001-DWQ	To-be-considered	Action-specific	Regulates pollutants in discharge of stormwater associated with small MS4s. Site SS016 is subject to Travis AFB's MS4 permit. Requires the implementation of BMPs to minimize the effects of disturbed soil on stormwater.	Permits are not ARARs because they are considered "administrative" in nature, and ARARs are substantive requirements. On the other hand, the numerical limits that a permittee has to follow are considered "substantive" and must be complied with. In addition, CERCLA sites are exempt from obtaining permits for remediation activities conducted entirely onsite. The Air Force will meet the substantive requirements of the Permit by using BMPs to minimize the potential impact on stormwater from the excavation.	Site SS016: 18 – Excavation/Offsite Disposal
RWQCB-SFB Basin Plan (the Basin Plan)	Chapter 2 – Beneficial Uses	To-be-considered	Action-specific	Establishes the beneficial uses of surface waters and groundwaters.	**Joint AF/State Comments:** The beneficial use designations in the basin plan apply to restoration actions for purposes of determining cleanup level. **AF Comments:** Beneficial use designation is not an ARAR, because it does not set a numeric standard. AF accepts the beneficial use designations in the basin plan for purposes of determining cleanup levels. Beneficial uses do not establish a level or degree of cleanup or a standard of control. The AF will recognize and identify in the ROD Amendment the designated beneficial uses and will utilize such use(s) to establish numerical cleanup levels and standards of control where pertinent. The AF reserves the right to challenge beneficial use designations as provided for by state law. **State Comments:** It is the Regional Water Board's position that the Basin Plan is not a TBC requirement, but an ARAR. The beneficial uses are the key to identifying numerical standards necessary to protect the uses. An ARAR is defined in CERCLA as a "standard, requirement, criteria, or limitation." The Basin Plan is the master policy document adopted by the Regional Water Board and approved by the Office of Administrative Law and the US EPA. The Basin Plan is an applicable requirement for discharge of treated groundwater. **EPA Comments:** With regard to the SFB Basin Plan, it is the EPA's position that Chapter 2, beneficial uses, which sets out designated beneficial uses, is one of only two parts of the Basin Plan that meets the NCP definition of a substantive standard. Therefore, EPA believes that the designated beneficial uses are "applicable" to the selected amended remedy for the NEWIOU at Travis to the extent the remedy implicates water resources covered by the SFB Basin Plan.	Site SS016: 18 – Excavation/Offsite Disposal

TABLE C-2
Travis Air Force Base NEWIOU SSSW Sites – Water ARARs
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California – Summary of ARARs

Source	Citation	ARAR Determination	ARAR Type	Description	Remarks	Sites and Alternatives
	Chapter 3 – Water Quality Objectives	To-be-considered	Action-specific	Establishes both narrative and numerical water quality objectives for surface and ground waters. Narrative objectives describe the water quality to attain via pollution control and form the basis for the numerical values. Numerical objectives are designed to limit the adverse effects of pollutants. Selected water quality objectives from the following lists potentially apply: • Table 3-1, Water Quality Objectives for Coliform Bacteria • Table 3-2, U.S. EPA Bacteriological Criteria for Water Contact Recreation • Table 3-4, Freshwater Water Quality Objectives for Toxic Pollutants for Surface Waters • Table 3-5, Water Quality Objectives for Municipal Supply • Table 3-6, Water Quality Objectives for Agricultural Supply	**Joint AF/State Comments:** Potential ARARs are water quality objectives (WQOs) for bacteria (2.2 organisms per 100 ml), chemical constituents based on State MCLs (if more stringent than Federal MCLs). Baseline risk assessment will evaluate cumulative human health and ecological risk and assist in identifying needs for risk reduction. AF and State disagree on whether Narrative Toxicity Objective could be an ARAR. **AF Comments:** The following are probably not ARARs: WQOs for chemical constituents based on secondary MCLs if not risk base; WQOs for taste, odor (not risk-based) narrative WQO for toxicity (vague and does not set a numerical standard). In evaluating other provisions, such as those regarding beneficial uses other than drinking water (MUN), AF would consider whether the provision is related to the beneficial use; is risk-based; is numeric; and is chemical-specific or location-specific. Water quality objectives in Tables 3-1, 3-2, and 3-4 potentially apply to discharges to Union Creek. Water quality objectives based on State MCLs (if more stringent than Federal MCLs) and other risk-based water quality objectives in Tables 3-5 and 3-6 potentially apply to groundwater. **State comments:** The ROD should include a narrative description identifying the beneficial uses. The beneficial uses are the key to identifying numeric standards necessary to protect the uses. ARARs are defined in CERCLA as "standard, requirement, criteria or limitation." It says nothing about "numeric standards." The State reserves the right to assure that all beneficial uses are protected as required by state and federal law. Narrative objectives are ARARs. How they are interpreted is addressed in the NCP and its preamble and also discussed in the EPA resolution of the Mather/George AFB dispute. With respect to taste and odor- although "secondary MCLs" they are still ARARs because taste and odor can interfere with the use of water. For example, MTBE has a strong odor at very low concentrations; some pesticides impart strong taste, etc. There is nothing in CERCLA that says that state requirements are not ARARs if they are not risk-based. State disagrees that Narrative Toxicity Objective is not an ARAR. The NCP clearly states that narrative standards are ARARs. Also see 40 CFR 122.44(d) which discusses implementation of narrative standards for discharges to surface water. The States are required to have a narrative toxicity objective for surface water in their basin plans. If EPA can require for surface water, states can certainly adopt for groundwater under state sovereign authority. State ARARSs are those standards that are more stringent than federal law, so if state adopts a narrative standard that is more stringent than federal law, it can be an ARAR. **EPA Comments:** With regard to the SFB Basin Plan, it is the EPA's position that Chapter 3, water quality objectives, which sets out water quality criteria based upon designated beneficial uses, is the only other part of the Basin Plan that meets the NCP definition of a substantive standard. Therefore, EPA believes that the water quality criteria are "applicable" to the selected amended remedy for the NEWIOU at Travis to the extent the remedy implicates water resources covered by the SFB Basin Plan.	Site SS016: 18 – Excavation/Offsite Disposal

TABLE C-2
Travis Air Force Base NEWIOU SSSW Sites – Water ARARs
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California – Summary of ARARs

Source	Citation	ARAR Determination	ARAR Type	Description	Remarks	Sites and Alternatives
Statement of Policy with Respect to Maintaining High Quality Waters in California (Anti-Degradation Policy)	SWRCB Resolution No. 68-16	To-be-considered	Chemical-specific	Requires that high quality surface and ground waters be maintained to the maximum extent possible. Degradation of waters will be allowed (or allow to remain) only if it is consistent with the maximum benefit to the people of the state, does not unreasonably affect present and anticipated beneficial uses, and does not result in water quality less than that prescribed in the RWQCB and State Water Resources Control Board (SWRCB) policies. If degradation is allowed, the discharge must meet best practicable treatment or control, which must prevent pollution or nuisance and result in the highest water quality consistent with maximum benefit to the people of the state.	**Joint AF/EPA/State Comments**: Res. 68-16 is a potential ARAR for the discharge and/or reinjection of treated effluent into existing high-quality surface water or groundwater. This is based on the EPA decision resolving a dispute between EPA, AF and State at Mather/George AFBs. Res. 68-16 is not an ARAR for determining cleanup levels. EPA, AF and State disagree on whether Res. 68-16 is a potential ARAR for the treatment of ground water via injection of treatment media. **AF Comments:** General AF position is Res. 68-16 is not an ARAR because it does not meet NCP criteria of enforceability and general applicability because it is directed to state agencies. It is also not relevant or appropriate because background level may be zero or a level not related to risk. AF also believes Res. 68-16 is not an ARAR for injection of media to groundwater, because treatment media is not a waste under Water Code Section 13050(d). **State Comments:** Res 68-16 is a promulgated standard that applies to discharges of waste to ground or surface water. It requires use of best practical treatment or control to achieve a level between background and the water quality standard. Res. 68-16 does apply to treatment via injection of treatment media. The injection can result in unintended consequences that can increase concentrations of constituents or form new compounds. The Regional Water Boards have adopted permits and other approvals of reinjection and found those to be generally consistent with Res. 68-16.	Site SS016: 18 – Excavation/Offsite Disposal
Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code 13304	SWRCB Resolution 92-49	To-be-considered (excluding procedures and policy relating to investigation)	Chemical-specific	Establishes policies and procedures for the oversight of investigation and cleanup and abatement activities resulting from discharges of waste which affect or threaten water quality. It requires cleanup of all waste discharged and restoration of affected water to background conditions (i.e., the water quality that existed before the discharge). Requires actions for cleanup and abatement to conform to Resolution No. 68-16, (Anti-degradation Policy) water quality control plans and policies, and applicable provisions of California Code of Regulations, Title 23, Division 3, Chapter 15 (Discharges of Hazardous Waste to Land) as feasible.	**Joint AF/State Comments**: AF and State disagree on whether Res 92-49 is a potential ARAR. As a practical matter, AF and State have been able to reach agreement on cleanup levels at specific sites. Although AF believes it is not required to do so, AF has conducted TEFAs to demonstrate that achievement of background levels is infeasible. TEFAs may be conducted as a part of the Feasibility Study if appropriate. Another option is to designate an interim cleanup level (such as an MCL) in the Record of Decision and conduct a TEFA after that interim cleanup level is achieved. **AF Comments:** In so far as Resolution 92-49 establishes a process for the RWQCB to follow, it is not applicable to the AF. However, the AF will accept the Resolution as a TBC. CERCLA and the NCP require that clean-up levels are to be protective, based on the identified risk to human health and the environment. Background levels are not risk based or necessary to protect human health and the environment. Investigation requirements are pre-remedy and therefore are not ARARs, because ARARs specify clean up levels and standards of control a remedy must attain not the investigation of a site. AF conducts site investigations in accordance with the CERCLA process. The AF conducted a TEFA in conjunction with the Travis AFB Groundwater Focused Feasibility Study which demonstrated that achievement of background levels is infeasible. **State Comments:** It is the Regional Water Board's position that Res. 92-49 is an applicable ARAR, because according to CERCLA, state ARARs can be those that are more stringent than federal law. In addition, Res. 92-49 has language nearly identical to federal regulations that are also ARARs for groundwater cleanups.	Site SS016: 18 – Excavation/Offsite Disposal

TABLE C-2
Travis Air Force Base NEWIOU SSSW Sites – Water ARARs
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California – Summary of ARARs

Source	Citation	ARAR Determination	ARAR Type	Description	Remarks	Sites and Alternatives
					EPA Comments: Resolution 92-49 outlines the policies and procedures that the Regional Water Boards are required to apply for the investigation and cleanup and abatement of discharges subject to Section 13304 of the California Water Code. It is EPA's position that only Section III.G of Resolution 92-49 is "relevant and appropriate" to the selected amended remedy for the NEWIOU at Travis to the extent the remedy implicates water resources covered by Resolution 92-49. Because this is a narrative standard, the AF, as the lead Agency, needs to exercise its discretion to choose the cleanup level, giving deference to the State's interpretation of its own requirements. Section III.G therefore sets a level or standard of control, albeit a narrative one, and therefore is "substantive" and meets the first criterion for being an ARAR. The second criterion, promulgation, includes the requirement that a State standard be of general applicability and that it be legally enforceable. By its terms, Resolution 92-49 appears to be applicable to all circumstances covered by the requirement, not just to Superfund sites. Resolution 92-49 was issued in accordance with state procedural laws and is enforceable by means of orders issued by the Regional Water Boards under the authority of California Water Code Section 13304. The substantive portions of Resolution 92-49 therefore appear to have been "promulgated." Finally, Section III.G may be more stringent than the federal MCLs, depending on the factual circumstances, and therefore meets the final ARAR criterion.	
Sources of Drinking Water Policy	SWRCB Resolution 88-63	To-be-considered	Chemical-specific	Designates, with certain exceptions, all ground and surface waters have the beneficial use of municipal or domestic water supply.	**Joint AF/State Comments:** The beneficial use designations in the basin plan apply to restoration actions for purposes of determining cleanup levels. **AF Comments:** Resolution 88-63 is not an applicable requirement, because it applies only to RWQCBs. Nor is it relevant or appropriate in that it is procedural and does not establish substantive requirements for remediation. AF accepts the beneficial use designations in the basin plan for purposes of determining cleanup levels. Beneficial uses do not establish a level or degree of cleanup or a standard of control. The AF will recognize and identify in the ROD Amendment the designated beneficial uses and will utilize such use(s) to establish numerical cleanup levels and standards of control where pertinent. The AF reserves the right to challenge beneficial use designations as provided for by state law. **State Comments:** It is the Regional Water Board's position that Resolution 88-63 is an applicable ARAR, because the beneficial use designations in the Basin Plan apply to restoration actions at Travis AFB. **EPA Comments:** It is EPA's position that SWRCB Resolution 88-63 is "applicable" at Travis, because it provides specific numbers for what is or is not a drinking water source, and therefore is not just procedural. While Resolution 88-63 initially requires the Regional Water Boards to designate the uses of surface and ground waters in its Basin Plan, the Regional Water Boards have done this through issuance of their respective Basin Plans, so EPA does not consider the resolution a directive just to the Regional Water Boards. The specific surface and ground water designations are now "applicable" to all persons.	Site SS016: 18 – Excavation/Offsite Disposal

TABLE C-2
Travis Air Force Base NEWIOU SSSW Sites – Water ARARs
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California – Summary of ARARs

Notes:

AF = U.S. Air Force
AFB = Air Force Base
ARAR = applicable or relevant and appropriate requirement
BMP = best management practice
CCR = California Code of Regulations
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR = Code of Federal Regulations
MCL = maximum contaminant level
mL = milliliter(s)
NCP = National Contingency Plan
NEWIOU = North, East, West Industrial Operable Unit
NPDES = National Pollutant Discharge Elimination System
ROD = record of decision
RWQCB-SFB = California Regional Water Quality Control Board, San Francisco Bay
SWRCB = State Water Resources Control Board
TEFA = technical and economic feasibility analysis
WQO = water quality objective

TABLE C-3
Travis Air Force Base NEWIOU SSSW Sites – Air Quality ARARs
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California – Summary of ARARs

Source	Section	ARAR Determination	ARAR Type	Description	Remarks	Sites and Alternatives
BAAQMD Regulation 6: Particulate Matter, Rule 1 – General Requirements	6-1-301, 6-1-303	Relevant and Appropriate	Action-specific	A person shall not emit from any source for a period or periods aggregating more than three (3) minutes in any hour, a visible emission which is as dark as or darker than No. 1 on the Ringelmann Chart, > 20 percent opacity, or of such opacity as to obscure an observer's view to an equivalent or greater degree.	Relevant and appropriate for construction operations (e.g., excavation).	Site SS016: 18 – Excavation/Offsite Disposal
BAAQMD Regulation 6: Particulate Matter, Rule 1 – General Requirements	6-1-501	Applicable	Action-specific	Anyone subject to Regulation 6 Rule 1 must provide sampling and monitoring equipment and must keep records of the monitoring.		Site SS016: 18 – Excavation/Offsite Disposal

Notes:

ARAR = applicable or relevant and appropriate requirement
BAAQMD = Bay Area Air Quality Management District
NEWIOU = North/East/West Industrial Operable Unit
ROD = record of decision
SSSW = soil, sediment, and surface water

Appendix D
Cost Estimates

TABLE D-1
Cost Estimate – Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, and the SSRW
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California – Cost Estimates

Item	Original ROD Alternative 16 – No Action	ROD Amendment Alternative 16 – No Action
Capital Cost	$0	$0
O&M Cost (annual)	$0	$0
Duration of Remedy (years)	30	0
Interest Rate[a]	2.8%	2.8%
O&M Cost (PV)	$0	$0
Periodic Cost (every 5 years)	**$200**	**$0**
Year	**Periodic Cost – PV**	**Periodic Cost – PV**
5	$0	$0
10	$0	$0
15	$0	$0
20	$0	$0
25	$0	$0
30	$0	$0
Periodic Cost (PV)	**$0**	**$0**
Alternative Subtotal Cost (PV)[b]	**$0**	**$0**
Contingency 0%	$0	$0
Project Management (5%)	$0	$0
Remedial Design (5%)	$0	$0
Construction Management (5%)	$0	$0
Alternative Total Cost	**$0**	**$0**

[a] Office of Management and Budget Circular A-94 – *Guidelines and Discount Rates for Benefit-Cost Analyses of Federal Programs, 12-14-14.*

[b] Alternative Subtotal Cost: O&M PV + Periodic Cost PV.

Notes:

NEWIOU = North/East/West Industrial Operable Unit
O&M = operations and maintenance
PV = present value
ROD = record of decision
SSRW = Storm Sewer Right-of-Way
SSSW = soil, sediment, and surface water

TABLE D-2
Cost Estimate – Site SS016 OSA Area
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California – Cost Estimates

Item	Original ROD Alternative 17 – Land Use and Access Restrictions	ROD Amendment Alternative 18 – Excavation/ Off-base Disposal
Capital Cost	**$0**	**$396,831**
Soil excavation, 100 yd^3	$0	$115,400
Backfill, compacted, 100 yd^3	$0	$49,724
Landfill disposal, Class II, 100 yd^3	$0	$15,000[e]
Site setup, restoration	$0	$117,500
Project Closeout	--	$99,207
O&M Cost (annual)	$2,400	$0
Duration of Remedy (years)	30	1
Interest Rate[a]	3.4%	2.8%
O&M Cost (PV)	$26,407	$0
Periodic Cost (every 5 years)	**$200**	**$0**
Year	**Periodic Cost – PV**	**Periodic Cost – PV**
5	$169	$0
10	$143	$0
15	$121	$0
20	$102	$0
25	$87	$0
30	$73	$0
Periodic Cost (PV)	**$696**	**$0**
Alternative Subtotal Cost (PV)[b]	**$27,103**	**$396,831**
Contingency 0%[c] 15%[d]	$0	$59,525
Project Management (5%)[c, d]	$84	$19,842
Remedial Design[c, d]	$70	$66,138
Construction Management (5%)[c, d]	$70	$19,842
Alternative Total Cost	**$27,327**	**$562,177**

[a] Office of Management and Budget Circular A-94 – *Guidelines and Discount Rates for Benefit-Cost Analyses of Federal Programs, Nov 2017.*

[b] Alternative Subtotal Cost: O&M PV + Periodic Cost PV.

[c] Alternative 17: No Contingency costs; Project Management, Remedial Design, and Construction Management percentage rates applied to the annual O&M cost.

[d] Alternative 18: Contingency, Project Management, and Construction Management percentage rates applied to the capital cost.

[e] Costs were estimated using institutional experience on similar sites and actual costs from subcontractors in the vicinity of Travis AFB. The September 2018 price is based on quotes obtained from Bradley Tanks, Inc. and Recology Hay Road Landfill in Vacaville, California.

Notes:

-- = cost not estimated
NEWIOU = North/East/West Industrial Operable Unit
O&M = operations and maintenance
OSA = Oil Spill Area
PV = present value
ROD = record of decision
SSSW = soil, sediment, and surface water
yd^3 = cubic yard(s)

TABLE D-3
Cost Estimate – Site SD033
Amendment to the NEWIOU SSSW ROD, Travis Air Force Base, California – Cost Estimates

Item	Original ROD Alternative 17 – Land Use Controls	ROD Amendment Alternative 16 – No Further Action
Capital Cost	$0	$0
O&M Cost (annual)	$2,400	$0
Duration of Remedy (years)	30	0
Interest Rate[a]	3.4%	2.8%
O&M Cost (PV)	$26,407	$0
Periodic Cost (every 5 years)	$200	$0
Year	**Periodic Cost – PV**	**Periodic Cost – PV**
5	$169	$0
10	$143	$0
15	$121	$0
20	$102	$0
25	$87	$0
30	$73	$0
Periodic Cost (PV)	**$696**	**$0**
Alternative Subtotal Cost (PV)[b]	**$27,103**	**$0**
Contingency 0%[c]	$0	$0
Project Management (5%)[c]	$84	$0
Remedial Design (5%)[c]	$70	$0
Construction Management (5%)[c]	$70	$0
Alternative Total Cost	**$27,327**	**$0**

[a] Office of Management and Budget Circular A-94 – *Guidelines and Discount Rates for Benefit-Cost Analyses of Federal Programs, 12-14-14.*

[b] Alternative Subtotal Cost: O&M PV + Periodic Cost PV.

[c] Alternative 17: No Contingency costs; Project Management, Remedial Design, and Construction Management percentage rates applied to the annual O&M cost.

Notes:

NEWIOU = North/East/West Industrial Operable Unit
O&M = operations and maintenance
PV = present value
ROD = record of decision
SSSW = soil, sediment, and surface water

Appendix E
Response to Comments

Responses to Comments on the
Draft Amendment to the North/East/West Industrial Operable Unit Soil, Sediment, and Surface Water Record of Decision,
Environmental Restoration Program Sites SS016 and SD033, June 22, 2018
Travis Air Force Base, California

EPA Offices of Regional Counsel

No.	Comments	Responses
REVIEW COMMENTS – EPA Offices of Regional Counsel – dated October 17, 2018, February 27, 2019, and April 8, 2019		
GENERAL COMMENTS		
1.	The RODA characterizes Alternative 16 for Site SD033 as "No Action," but the basis of the change from the originally selected LUCs remedy (Alternative 17), is that the cleanup of soil contamination in the context of other "actions/activities" has eliminated the necessity for LUCs. In this context, the more accurate characterization is "No Further Action" ("NFA").	We agree that "No Further Action" provides a more accurate description of the selected remedy, since the achievement of cleanup standards took place in association with an unrelated field event. To be consistent with the NEWIOU Proposed Plan that supports this amendment, we revised the description of Alternative 16 in Table 4-2 (Summary Descriptions of Selected Soil Remedies) from "No Action for Soil and Sediment" to "No Action, including NFA following previous field activities." All subsequent references to the Alternative 16 in the ROD Amendment will include "No Action/NFA" to cover all no action situations.
1a. (02/27/19)	**Response to General Comment 1:** After reviewing the AF response to Specific Comment 8 and 18, it appears that a previous CERCLA response did not occur, however a response under another authority took place. Therefore, a footnote should be added explaining that prior cleanup actions were taken under non-CERCLA authority and specifying the authority. Also, EPA prefers to use the language "No Further Action" instead of "No Action, including No Further Action" or "No Action/NFA" because the NFA designation clearly conveys that there was risk at the site that was addressed through a previous clean-up action. Please revise the text to "No Further Action."	Throughout the ROD Amendment, Alternative 16 – No Action for Soil and Sediment is identified as an alternative in the original ROD and one of the selected alternatives in the ROD Amendment. Because changing Alternative 16 – No Action for Soil Sediment to Alternative 16 – No Further Action would be misleading when referring to this alternative for Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW, we have added two separate footnotes describing the context of each Alternative 16 description. We have added the following footnotes to Section 1.2, 2.5, and Table 4-2. For Site SS016 Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW, the alternative description will remain as indicated and the following footnote added: "No prior remedial or removal actions have occurred at Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW of Site SS016. Thus, no action is necessary for soil and sediment in these areas." For Site SD033, the alternative description will be revised to "No Further Action" as requested, and the following footnote added: "Prior OWS corrective actions at Site SD033 were non-CERCLA cleanup actions conducted in accordance with the *Corrective Action Plan for DERA-funded Oil/Water Separators* (CH2M HILL, 2016) under the authority of the California State Water Resources Control Board UST Cleanup Program."

No.	Comments	Responses
SPECIFIC COMMENTS		
1.	**Page 2-1, 2nd ¶, last sentence:** Please change the term "exceptions" to a term such as "changes" to better reflect the cited examples.	We have revised the last sentence of the second paragraph to read as follows: "A few changes to the environmental programs at Travis AFB include the following:"
2.	**Page 2-3, 2 ¶s before § 2.2:** In both cases, please revise the text to expressly state that confirmation sampling was conducted and that the sampling confirmed the cleanup standards were achieved. Although the last paragraph before Section 2.2 references confirmation sampling, it does not state what the results of the sampling were.	We added the following sentence at the end of the third paragraph on page 2-3: "Confirmation sampling was conducted, and results from the sampling confirmed that cleanup standards were achieved." We added the following sentence to the end of the fourth paragraph on page 2-3: "Results from the sampling confirmed that cleanup standards were achieved."
3.	**Page 2-6, 1st ¶, last sentence:** Please revise the paragraph to clarify the relationship between the soil contamination at Facility 810 and Site SD033. It appears from the text that the only soil contamination at Site SD033 is at Facility 810 and that the first paragraph is an introduction followed in the subsequent paragraphs by a discussion of specific areas around Facility 810 where contamination was found and "removed." If that is the case, the text in the first paragraph should clearly say so.	We added the following sentence in front of the first sentence in the first paragraph of Section 2.2.2: "After the sediment remedial action was conducted in the Union Creek portion of Site SD033 (ITSI 2010), soil contamination was limited to Facility 810 only at Site SD033." We also added the following sentence after the last sentence in the first paragraph of Section 2.2.2 as follows: "Following is a summary of the fieldwork conducted around Facility 810 where contamination was found and subsequently removed."
4.	**Page 2-13, 2nd ¶, 3rd – 5th sentences:** Please revise the text to clarify the logic of the three sentences; i.e., why the overestimation of chromium risks and the EPC being less than the reference concentration leads to the chromium being considered a "non-site-related chemical."	We have revised sentences 3-5 in the second paragraph of Section 2.3.1.3 as follows: "However, chromium risks are overestimated as it is assumed that chromium found in soil at the site is 100 percent in the hexavalent form as required by EPA and DTSC, which is a conservative assumption. There is no information available that suggests chromium is only found in the 100 percent hexavalent form, as it is primarily found in the environment in the trivalent form. Hexavalent chromium is generally produced by industrial processes such as electroplating and wood preservation or used as a corrosion inhibitor. In addition, the chromium EPC is less than the Travis AFB maximum inorganic reference concentration (background). Therefore, chromium was considered a non-site-related chemical and not identified as a COC."

No.	Comments	Responses
5.	**Page 3-1:** The discussion of the various "actions" taken at Sites SS016 and SD033 is unclear as to under what authority the actions were taken, how they were documented etc. Please revise the text to clarify the nature of the actions taken, etc.	Detailed descriptions of the investigations conducted at Sites SS016 and SD033 are included in Sections 2.2.1 and 2.2.2 of this ROD-A. We have added citations to the first sentence in the fourth paragraph and to the third sentence in the fifth paragraph of Section 3 to indicate where the results have been documented. "An updated HHRA (CH2M HILL, 2018c) for residential exposure was conducted, which concluded that the chemical concentrations at Site SS016 continue to be associated with unacceptable levels of risk." "According to the 2016 data gap investigation (CH2M HILL, 2018a), fieldwork removed surface soil containing elevated concentrations of cadmium."
5a. (02/27/19)	**Response to Specific Comment 5:** The response partially addresses the comment. The text states where the referenced actions were documented, but doesn't clarify the authority pursuant to which the cleanup actions were taken. Further, the text in the 2nd paragraph of this section refers to "an action" being taken, and in the 4th paragraph, the text refers to the OWS removal and "seasonal field work". It is not clear what the seasonal field work was and under what authority it was conducted.	We removed the reference to "seasonal fieldwork" stated in paragraph 5 of Section 3.0. We have revised the text in paragraph 5 of Section 3.0 and have also included the authority under which this action was conducted. The first three sentences in paragraph 5 have been revised as follows: "In 2016, corrective actions were taken at Site SD033 for OWSs OW052 and OW057 in accordance with the *Corrective Action Plan for DERA-funded Oil/Water Separators* (CH2M HILL, 2016) under the authority of the California State Water Resources Control Board UST Cleanup Program. The excavation areas encompassed historical soil boring locations that were impacted by benzo(a)pyrene and surface soil containing elevated concentrations of cadmium (CH2M HILL, 2018a).
5b. (04/08/19)	**Review of Response to EPA ORC 022719 Comments on the Draft NEWIOU RODA:** In response to ORC follow-up comments 5a, 7a, and 8a, the AF clarified that contaminated surface soils were removed as part of the OWS removal performed under the Regional Water Board's oversight: "during the removal of the OWSs and surface soils in accordance with the Corrective Action Plan for DERA-funded Oil/Water Separators (CH2M HILL, 2016)," whereas the AF's original response to comment 8a, in particular, seemed to suggest that the surface soils were removed in the course of a separate action, the data gap investigation. Please ensure that the information about previous actions is clear and consistent throughout the RODA.	See response to specific comment #8a below.
6.	**Page 4, § 4.5, last sentence of last bullet point:** Please explain why a distinguishing feature of Alternative 18 (for Site SS016) and Alternative 16 (for Site SD033) is "the site being suitable for [UU/UE]," given that UU/UE will be the outcome of the RODA for Alternative 16 as well.	We have deleted the last sentence in the last bullet in Section 4.5 on page 4-5. We have included elements of this last sentence in the first bullet in Section 4.5 on page 4-5, and it reads as follows: "All newly selected alternatives are compatible with the intended site reuse and will result in the sites being suitable for unlimited use and unrestricted exposure."

No.	Comments	Responses
7.	**Page 4-6, § 4.5.2, 1st sentence:** The phrase "previous activities" is unclear; does it refer to CERCLA response actions? Also, the text should contextualize the time of the actions/activities, noting that is post-ROD.	We have revised the first sentence in Section 4.5.2 as follows: "OWSs and surface soils have been removed from Site SD033 and have reduced risk to levels that are currently acceptable under a residential exposure scenario (CH2M HILL, 2015)."
7a. (02/27/19)	**Response to Specific Comment 7:** The response partially addresses the comment. The authority pursuant to which the OWS and surface soils have been removed was not included.	We have revised the response to specific comment 7 and the first sentence in Section 4.5.2 as follows: "OWSs and surface soils have been removed from Site SD033 in accordance with the *Corrective Action Plan for DERA-funded Oil/Water Separators* (CH2M HILL, 2016) under the authority of the California State Water Resources Control Board UST Cleanup Program and have reduced risk to levels that are currently acceptable under a residential exposure scenario (CH2M HILL, 2015)."
7b. (04/08/19)	**Review of Response to EPA ORC 022719 Comments on the Draft NEWIOU RODA:** In response to ORC follow-up comments 5a, 7a, and 8a, the AF clarified that contaminated surface soils were removed as part of the OWS removal performed under the Regional Water Board's oversight: "during the removal of the OWSs and surface soils in accordance with the Corrective Action Plan for DERA-funded Oil/Water Separators (CH2M HILL, 2016)," whereas the AF's original response to comment 8a, in particular, seemed to suggest that the surface soils were removed in the course of a separate action, the data gap investigation. Please ensure that the information about previous actions is clear and consistent throughout the RODA.	See response to specific comment #8a below.
8.	**Page 4-8, § 4.6.2, 1st ¶:** The phrase "fieldwork activities" is unclear; please provide more information to enable the reader to, for example, understand whether the referenced "activities" are CERCLA- related or not.	We have revised the second paragraph to read as follows: "No remedial action is required at Site SD033, because during the removal of the OWSs according to the OWS POCO Closure Report (CH2M HILL, 2018b), and surface soils according to the 2016 data gap investigation (CH2M HILL, 2018a), contaminant concentrations exceeding residential cleanup levels for benzo(a)pyrene and cadmium were removed, and therefore no longer present at the site."

No.	Comments	Responses
8a. (02/27/19)	**Response to Specific Comment 8:** The response is still unclear regarding what cleanup activities took place and whether the activities were CERCLA or non-CERCLA. It appears that the OWS removal was a non-CERCLA action that addressed some contamination, and then another action took place that addressed other contamination, or was the additional work just an investigation?	We have revised the response to specific comment 8 and the first sentence in the second paragraph of Section 4.6.2 as follows: "No remedial action is required at Site SD033, because during the removal of the OWSs and surface soils in accordance with the *Corrective Action Plan for DERA-funded Oil/Water Separators* (CH2M HILL, 2016) under the authority of the California State Water Resources Control Board UST Cleanup Program, contaminant concentrations exceeding residential cleanup levels for benzo(a)pyrene and cadmium were removed, and therefore no longer present at the site."
8b. (04/08/19)	**Review of Response to EPA ORC 022719 Comments on the Draft NEWIOU RODA:** In response to ORC follow-up comments 5a, 7a, and 8a, the AF clarified that contaminated surface soils were removed as part of the OWS removal performed under the Regional Water Board's oversight: "during the removal of the OWSs and surface soils in accordance with the Corrective Action Plan for DERA-funded Oil/Water Separators (CH2M HILL, 2016)," whereas the AF's original response to comment 8a, in particular, seemed to suggest that the surface soils were removed in the course of a separate action, the data gap investigation. Please ensure that the information about previous actions is clear and consistent throughout the RODA.	We reviewed the ROD-A to verify that text is consistent throughout the document, and we made the following additional text changes to ensure that the information provided about previous actions is consistent: **Section 2.1.2; last paragraph:** "Also in 2016, two (2) historical soil boring locations (W0810B03 and W0810B04) were excavated to a depth of 6 inches while conducting the OWS corrective action, which also removed surface soil that contained elevated cadmium concentrations. Confirmation sample collection in these two (2) locations and laboratory analysis demonstrated that cadmium concentrations in these locations were now below residential standards." **Section 2.2.2; third paragraph:** "According to the *Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046* (CH2M HILL, 2018), surface soil sample analytical results were to be compared to this residential cleanup level. After the Work Plan was finalized, the EPA released updated toxicity values (EPA, 2018) that changed the residential cleanup level for cadmium to 71 mg/kg. During the 2016 data gap investigation, surface soil samples (SS2456x33 through SS2459x33) were collected from four (4) locations near boring W0810B04 and analyzed for cadmium (Figure 2-2). The maximum cadmium concentration in the vicinity of W0810B04 was from SS2457x33 (0.31 J mg/kg) which is lower than the new residential cleanup level (71 mg/kg). The soil in the immediate vicinity of boring W0810B04 was removed during the OWS corrective action, and confirmation sample analysis demonstrated that the cadmium concentrations no longer exceeded the cadmium residential cleanup level (71 mg/kg) (CH2M HILL, 2018)." **Section 2.2.2; fourth paragraph; last sentence:** "However, at one (1) historical surface sample location (W0810B03), the benzo(a)pyrene detection limit did exceed the current residential cleanup level, but the surface soil at this location was excavated in 2016 while conducting the OWS corrective action."

No.	Comments	Responses
		Section 2.2.2; paragraph 6: "In the wash rack area, also on the east side of Building 810, only one (1) shallow soil sample (W0810B03) had historically been collected, and laboratory analysis of that sample detected a cadmium concentration of 15.1 mg/kg, which exceeded the residential cleanup level (5.2 mg/kg) identified in the Work Plan (CH2M HILL, 2016). As a result, two (2) surface soil samples from soil boring locations SS2454x33 and SS2455x33 were collected during the 2016 data gap investigation and analyzed for cadmium and PAHs. Cadmium concentrations did not exceed the residential cleanup levels (original or updated values) in either 2016 sampling location. The soil in the immediate vicinity of boring W0810B03 was removed during the OWS corrective action, and confirmation samples indicated that the cadmium concentrations no longer exceeded the residential cleanup level (71 mg/kg) (CH2M HILL, 2018)." **Section 7.1; third bullet:** "No further remedial action is required at this site. PAH and cadmium contaminated surface soil and the OWS at the site had been previously excavated while conducting the OWS corrective action and disposed of at an off-base landfill. The risk assessment associated with the 2016 data gap investigation concluded that Site SD033 does not pose a potential human health risk under the residential land use scenario."
9.	**Page 5-4, Table 5-1, Row 1, Column 2, 1st ¶:** The text compares the short-term effectiveness of Alternatives 17 and 18 but, unlike the text on page 5-10, § 5.1.1.5, does not acknowledge that there is greater risk associated with Alternative 18 because contaminated soil is being disturbed and moved. Please revise the text in the table to make it consistent with the text on page 5-10.	In Table 5-1 under the "Short-term Effectiveness" evaluation criterion, we have revised the first sentence, in the first paragraph, under Alternative 18 (column 2) as follows: "Potentially greater adverse effects to the community, workers, or environment are anticipated during implementation of Alternative 18 as compared to the implementation of Alternative 17."
10.	**Page 5-8, Table 5-2, Row 1, Column 2:** The text states that there are no costs associated with Alternative 16, but presumably there is some cost associated with removal of the LUCs even if just de minimis.	We revised the first sentence under the cost evaluation criteria, third column of Table 5-2 as follows: "In contrast to Alternative 17, under Alternative 16 – No Action/NFA, no long-term costs are incurred. Alternative 16 does have a minor capital cost associated with the removal of LUC warning signs from the site."
10a. (02/27/19)	**Response to Comment 10:** The response partially addresses the comment. The text references cost of removing signs, but does not reference any cost related to recording documents to note the removal of the LUCs.	We revised the response to Specific Comment 10 and under the cost evaluation criteria, third column of Table 5-2 as follows: "In contrast to Alternative 17, under Alternative 16 – No Further Action, no long-term costs are incurred. Alternative 16 does have a minor capital cost associated with the removal of LUC warning signs from the site and preparing a report to document the removal of LUCs."

No.	Comments	Responses
11.	**Page 5-8, Table 5-2, Row 2, Column 2, 3rd sentence:** Please clarify the reference to "removal actions" as it is unclear whether this refers to CERCLA removal actions (i.e., TCRAs or NTCRAs) or just is being used in a non-technical sense of removing contamination (then under what authority?).	In Table 5-2, we have revised the State/Regulatory Agency Acceptance criterion under the Alternative 16 (ROD Amendment) column, third sentence, as follows: "However, as a result of removing the OWSs (CH2M HILL, 2018b) and surface soils (CH2M HILL, 2018a), contaminants exceeding cleanup levels are no longer present at the site as described in Section 8.2."
12.	**Page 5-9, § 5.1.1.2, 3rd ¶:** Please revise/remove this paragraph sentence; the physical removal of soil contaminants is not relevant to ARARs compliance (i.e., a remedy that leaves contamination in place can be ARARs compliant).	We have revised the third paragraph of Section 5.1.1.2 as follows: "For Site SS016 OSA Area, Alternative 18 is preferred because soil contaminants are physically removed from the site, and residual concentrations of soil contaminants are below residential cleanup levels."
13.	**Page 5-10, § 5.1.1.6, 2nd ¶, penultimate sentence:** The text regarding Alternative 17 not being technically implementable is inconsistent with the text in Table 5-1- "Alternative 17 . . . has been demonstrated to be both technically and administratively implementable." In addition, the Alternative already has been implemented so to say that is not technically implementable because LUCs no longer are needed is misplaced. Please revise the text to remove the inconsistency with the Table 5-1 text and the misplaced comment that Alternative 17 is not technically implementable.	We have revised the last two sentences of the second paragraph as follows: "For Site SD033, the continuation of LUCs under Alternative 17 is not necessary, since soil concentrations at Site SD033 already meet residential soil cleanup levels. Therefore, Alternative 16 (No Further Action) will be implemented. There are no issues related to technical implementation of the soil remedy."
14.	**Page 5-11, § 5.1.1.7, 3rd ¶, last sentence:** The text indicating that potential future costs cannot be quantified is not consistent with the other sections of the document, which quantify cost for both alternatives. This sentence should instead indicate that the long-term costs of continuing LUCs are greater than the short-term expense of excavation and disposal.	We have revised the last sentence in the third paragraph of Section 5.1.1.7 as follows: "However, after years of enforcing LUCs at Site SS016 as well as other soil and groundwater sites, it became obvious that the long-term costs of continuing LUCs at an active military installation are greater than the short-term expense of excavation and disposal."
15.	**Page 7-1, § 7.1, 1st ¶, penultimate sentence:** Please revise the phrase "past actions" to clarify the nature of, and basis of authority for, the actions.	We have revised the second to last sentence in the first paragraph of Section 7.1 as follows: "Although no action is being taken at Site SD033 under Alternative 16, current site conditions are protective of human health and the environment as a result of removing the OWSs and surface soils (CH2M HILL, 2018a and 2018b)."
16.	**Page 7-1, § 7.1, 2nd bullet point, 1st sentence:** If no remedy ever was selected or implemented for the referenced facilities, then please change the phrase "No further action" to "No action."	We have replaced the text "no further action" with "no action" in the second bullet in Section 7.1.

No.	Comments	Responses
17.	**Page 7-2, § 7.5:** Please revise the text to separate the discussion of Site SS016 and SD033 for clarity's sake.	We have revised Section 7.5 Preference for Treatment as a Principal Element as follows: "The EPA prefers alternatives that use treatment to clean contaminated soil. However, no treatment processes are utilized in the selected remedy at Site SS016 because of the low volume of soil to dispose of, making treatment impracticable and not cost-effective. Toxicity, mobility, and volume would effectively be reduced at Site SS016 upon excavation, but not through treatment. Thus, the statutory preference for treatment as a principal element will not be met through Alternative 18, and the selected remedy does not satisfy the statutory preference for treatment as a principal element of the site remedy. No treatment processes are utilized in the selected remedy (Alternative 16) at Site SD033, because no further action is required at the site. Thus, the statutory preference for treatment as a principal element will not be met through Alternative 16, and the selected remedy does not satisfy the statutory preference for treatment as a principal element of the site remedy. Section 8 provides further details on the preferred remedial action selected for Sites SS016 and SD033, including the rationale for not selecting a treatment technology for these sites."
18.	**Page 8-2, § 8.2:** This section appears to describe the cleanup efforts variously described in earlier portions of the RODA as "actions," "previous activities," "fieldwork activities," "removal actions," and "past actions." To avoid the confusion and uncertainty associated the use of these various terms, the description of the cleanup efforts provided in this section should be incorporated at least in part in the earlier sections so that the nature and basis of the actions, activities, etc., is made clear early on. In addition, in the third paragraph the text references a decision to continue excavation beyond that required to remove petroleum contaminated soil, but it does not indicate the authority pursuant to which this determination was made. Please provide this information. Also, in the fourth paragraph, please describe the legal basis for the "surface scrape activities" that were conducted as part of the 2016 data gap investigation, and how they relate to the investigation.	The cleanup efforts for SD033 are also described in detail in Section 2.2.2 of the ROD-A. We have included additional citations throughout the ROD-A to better connect the previous activities conducted at the site as described in Section 2.2.2 and 8.2 with the information presented in the ROD-A. We revised the third and fourth paragraphs of Section 8.2 as follows: "Within Site SD033 at Facility 810, there were two (2) OWSs that were removed in areas that were contaminated with benzo(a)pyrene and/or cadmium. One (1) OWS (OW052) was located on the east side of Facility 810, near cadmium-contaminated soil associated with Site SD033. The second OWS (OW057) was located on the west side of Building 810 near the cadmium- and benzo(a)pyrene-contaminated soil associated with Site SD033. OW052 and OW057 were decommissioned in accordance with the *Corrective Action Plan for DERA-funded Oil/Water Separators* (CH2M HILL, 2016). In conjunction with the decommissioning of the OWSs, cadmium-contaminated soil, located near the OWSs, were excavated and removed. Confirmation soil samples were collected from the areas of excavation, and all petroleum- and nearly all metals-contaminated soil was removed (CH2M HILL, 2018b).

No.	Comments	Responses
		Afterwards, an updated risk assessment that was conducted as part of the 2016 data gap investigation, using the results of the data gap investigation in conjunction with the OWS confirmation samples, identified no unacceptable risk from soil contaminants at Site SD033. This new data demonstrated that the proposed excavation remedy under Alternative 18 as described in the 2015 NEWIOU Proposed Plan is no longer necessary, because the soil contaminant concentrations at Site SD033 had been reduced during the OWS removal to allow for unlimited use and unrestricted exposure. The *Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043, and SS046* (CH2M HILL, 2018a) describes the collection and analysis of surface soil samples that led to the reevaluation of site conditions. As a result of this reevaluation, the Air Force selected Alternative 16 – No Further Action as the soil remedy for Site SD033 under this ROD Amendment. Alternative 16 is an appropriate remedy selection for Site SD033, since the intent of the original soil remedy had already been carried out under an unrelated POCO action."
19.	**ARARs Table:** EPA's comments on the WABOU RODA also apply to the NEWIOU ARARs table. EPA's earlier submitted comments already noted the need for an ARAR related to staging piles and potentially for fluid management (i.e., equipment decontamination rinse liquids), but EPA's comments on the SFB Basin Plan and SWRCB Resolutions Nos. 68-16, 92-49, and 88-63 also apply to the NEWIOU ARARs per the Water Board's comments. In the case of the NEWIOU, however, EPA expects the ARARs table itself to reflect EPA's comments, not just the AF RTCs. This includes changing the term "potential" in the agree-to-disagree language when used in relation to a "joint statement" setting forth the parties' agreement on the application of some part of a citation for determining cleanup requirements. It also includes further discussion about certain citations that are not ARARs because the actions undertaken do not involve actions covered by the citation such as the Title 27 and Title 23 citations identified by the Water Board.	ARARs presented in Appendix C of the ROD-A have been discussed, reviewed, and revised according to conversations conducted with the Air Force, EPA, and Water Board legal representative.

Responses to Comments on the
Draft Amendment to the North/East/West Industrial Operable Unit Soil, Sediment, and Surface Water Record of Decision,
Environmental Restoration Program Sites SS016 and SD033, June 22, 2018
Travis Air Force Base, California

Environmental Protection Agency Region IX

No.	Comments	Responses
REVIEW COMMENTS – Nadia Hollan Burke, EPA Region IX – dated August 22, 2018, October 19, 2018, February 27, 2019, and April 8, 2019		
GENERAL COMMENTS		
1. (08/22/18)	The Draft Amendment to the North/East/West Industrial Operable Unit (NEWIOU) Soil, Sediment, and Surface Water (SSSW) Record of Decision (RODA) (Draft NEWIOU SSSW RODA) does not use the most recent regional screening levels (RSLs). The Draft NEWIOU SSSW RODA references the 2016 RSLs levels in the text, while the May 2018 RSLs have been released. Please revise the Draft NEWIOU SSSW RODA to include the most recent EPA RSLs available or explain why the most recent RSLs are not referenced.	We updated the NEWIOU ROD-A to reflect the "May 2018 EPA RSLs."
2. (08/22/18)	Additional information should be provided in the Draft NEWIOU SSSW RODA about the basis for the proposed excavation area and volume of soil to be excavated for Alternative 18: Excavation/Off-base Disposal (Site SS016 OSA Area). While the target volume of excavated soil is included in Tables 2-1 and 4-6, the text does not specifically discuss the locations of the proposed excavation areas and the basis for the excavations. Please revise the Draft NEWIOU SSSW RODA to include a description of the proposed areas to be excavated, and a reference to the figures that show the excavation areas.	We added the following text to Section 2.2.1: "The updated soil remedy to address the PAH contamination at Site SS016 is supported by the analytical results from the data gap investigation (CH2M HILL, 2018b) where benzo(a)pyrene, benzo(b)fluoranthene, benzo(a)anthracene, dibenz(a,h)anthracene, and naphthalene concentrations exceed their residential cleanup levels and were identified as COCs. The results from this data gap investigation were used to clarify the extent of the excavation footprint for this remedy. There are two (2) small excavation areas of approximately 4,500 and 900 square feet at Site SS016. The excavation at both areas will be conducted to a depth of approximately 0.5 foot bgs and will result in approximately 100 cubic yards of contaminated soil removed (target volume). Figure 2-2 presents the excavation areas, target depths, and boring locations that contain the impacted soil."

No.	Comments	Responses
3. (08/22/18)	Section 4 of the Draft NEWIOU SSSW RODA does not include a summary of the rationale used to estimate costs associated with the excavation and off-base disposal proposed in Alternative 18 and summarized in Table D-2, Cost Estimate – Site SS016 OSA Area. Please update Section 4 to include a section summarizing the estimated remedy costs and discuss the rationale for the costs associated with implementing Alternative 18.	We have inserted the following text before the last sentence in the first paragraph of Section 4.5.1: "Alternative 18 is being completed under a performance-based contract between CH2M HILL and USACE Omaha District. Costs were estimated using institutional experience on similar sites and actual costs from subcontractors in the vicinity of Travis AFB. The removal cost estimate is $396,831, the sum total of which will be paid by the Air Force. The cost to the Air Force is fixed and inclusive of all contingencies. This estimate considers the following: • Planning/work plans • Excavation • Transportation and disposal • Travel and oversight • Remedial action reports and documentation"
3a. (10/19/18)	**Responses to General Comment 3 and Specific Comment 17:** The responses address the comments; however, the response to General Comment 3 indicates that "Costs were estimated using institutional experience on similar sites and actual costs from subcontractors in the vicinity of Travis AFB," so these sources should also be incorporated into the footnote that will be added to Table D-2 in response to Specific Comment 17. Please include the other sources of costing information in the footnote that will be added to Table D-2.	We have inserted the following text as note "e" in Table D-2 of Appendix D: "[e] Costs were estimated using institutional experience on similar sites and actual costs from subcontractors in the vicinity of Travis AFB. The September 2018 price is based on quotes obtained from Bradley Tanks, Inc. and Recology Hay Road Landfill in Vacaville, California."
4. (08/22/18)	The Draft NEWIOU SSSW RODA should be revised to include a statement describing the upkeep of land use controls (LUCs) while the sites are transitioning. Please revise the text to state that LUCs will be maintained until the concentrations of hazardous substances in the soil are at such levels to allow for unrestricted use and unlimited exposure (UU/UE). Also, describe if this information will be included in the Annual Land Use Control Report.	We added text to Section 2.5, ROD Amendment Remedy Selection, last paragraph (first sentence and last sentence, respectively) as follows: "Prior to and during the remedial action, LUCs will continue to be maintained and monitored until the concentrations of hazardous substances in the soil are at levels that allow for unlimited use and unrestricted exposure. The Air Force will continue to exercise this responsibility in accordance with CERCLA and the NCP and at the appropriate time, will document these remedy changes in the Annual Land Use Control Report."

No.	Comments	Responses
5. (08/22/18)	The Draft NEWIOU SSSW RODA should be revised to include a statement that any activity that is inconsistent with the institutional controls (IC) objectives or use restrictions, or any other action that may interfere with the effectiveness of the ICs will be addressed by the Air Force as soon as practicable, but in no case will the process be initiated later that __ days (10 days suggested) after the Air Force becomes aware of such a breach. Additionally, the Air Force should notify EPA and the State of California as soon as practicable but no longer than 10 days after discovery of any activity that is inconsistent with the IC objectives or use restrictions, or any other action that may interfere with the effectiveness of the ICs. The Draft NEWIOU SSSW RODA should also state that the Air Force will notify EPA and the State of California regarding how the Air Force has addressed or will address the breach within 10 days of sending to EPA and the State of California notification of the breach. Please revise the text to include the suggested information.	We added the following paragraph after the first paragraph of Section 4.3 (Description of Alternatives): "The Air Force will continue to maintain LUCs as the selected remedy for Site SS016 as described in Section 5.4 of the NEWIOU SSSW ROD (Travis AFB, 2006) until the RAOs as described in Section 4.1 of this ROD Amendment are achieved. If the soil cleanup levels listed in Table 4-1 of this ROD Amendment are not achieved, the Air Force will continue to maintain the existing LUCs and comply with all notification and inspection requirements identified in Section 5.4 of the NEWIOU SSSW ROD (Travis AFB, 2006). Once the Site SS016 RAOs are achieved, the Air Force will obtain concurrence from EPA and the state before the Site SS016 LUCs are removed."
6. (08/22/18)	The Draft NEWIOU SSSW RODA should be revised to include the following information. A statement that the Air Force should notify EPA and the State of California __ days (45 days suggested) in advance of any proposed land use changes that are inconsistent with land use control objectives or the selected remedy. Additionally, the Air Force will provide notice to EPA and the State of California at least 6 months prior to any transfer or sale of [OUs at issue] so that EPA and the State of California can be involved in discussions to ensure that appropriate provisions are included in the transfer terms or conveyance documents to maintain effective ICs. If it is not possible for the facility to notify EPA and the State of California at least 6 months prior to any transfer or sale, then the facility will notify EPA and the State of California as soon as possible but no later than 60 days prior to the transfer or sale of any property subject to ICs. In addition to the land transfer notice and discussion provision above, the Air Force further agrees to provide EPA and the State of California with similar notice, within the same time frames, as to federal-to-federal transfer of property. The Air Force shall also provide a copy of the executed deed or transfer assembly to EPA and the State of California. Please revise the text to include this information.	Please see the response to General Comment #5.

No.	Comments	Responses
6a. (10/19/18)	**Response to General Comment 3:** The response partially addresses the comment. The response references the response to General Comment 5, but this response does not include the specific timeframes requested in General Comment 6. Please revise the response to include the specific timeframes requested in the comment.	This comment appears to be associated with General Comment #6 rather than General Comment #3. We have revised the response to General Comment 5 to include the timeframes requested in General Comment 6 as follows: "The Air Force will continue to maintain LUCs as the selected remedy for Site SS016 as described in Section 5.4 of the NEWIOU SSSW ROD (Travis AFB, 2006) until the RAOs as described in Section 4.1 of this ROD Amendment are achieved. Once the Site SS016 RAOs are achieved, the Air Force will obtain concurrence from EPA and the state before the Site SS016 LUCs are removed. If the soil cleanup levels listed in Table 4-1 of this ROD Amendment are not achieved, the Air Force will continue to maintain the existing LUCs and comply with all notification and inspection requirements identified in Section 5.4 of the NEWIOU SSSW ROD (Travis AFB, 2006), including notifying EPA and the state within 10 days should a breach of the LUCs occur, and identifying how the Air Force has or will address the breach. In addition, the Air Force will also notify EPA and the state 30 days in advance of any proposed land use changes inconsistent with LUCs, and at least 6 months prior to any sale of property with LUCs. Once the Site SS016 RAOs are achieved, the Air Force will obtain concurrence from EPA and the state before the Site SS016 LUCs are removed."
7. (08/22/18)	The Draft NEWIOU SSSW RODA should be revised to include a statement that monitoring of the environmental use restrictions and controls are conducted annually by the Air Force. The monitoring results are included in the Annual Land Use Control Report, and provided to EPA and the State of California. The annual monitoring reports will be used in preparation of the Five Year Review to evaluate the effectiveness of the remedy. The annual monitoring report, submitted to the regulatory agencies by the Air Force will evaluate the status of the ICs and how any IC deficiencies or inconsistent uses have been addressed. Please revise the text to include this information.	Please see the response to General Comment #5.
8. (08/22/18)	Page 1-2 of the Draft NEWIOU SSSW RODA includes the following statements "The Air Force shall not modify or terminate LUCs, implementation actions, or land usage without approval by EPA and the State of California. The Air Force shall seek concurrence by EPA and the state before any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for them." The document text should also include these statements whenever the modification or termination of LUCs is discussed.	We believe that the purpose of this comment is to ask the Air Force to add "by EPA and the state" to the second sentence. We have revised this statement in Section 1.2, page 1-2, second from last paragraph (last sentence) as follows: "The Air Force shall seek concurrence by EPA and the state before any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for them."

No.	Comments	Responses
SPECIFIC COMMENTS		
1. (08/22/18)	**Section 1.1 Site Name and Location:** "EPA Operable Unit 2" is not identified in the text. Please identify "EPA Operable Unit 2" at the end of the Operable Unit/Site Designation information.	We added "EPA OU 2" to the end of the Operable Unit/Site designation information in Section 1.1.
2. (08/22/18)	**Section 1.3 Authorizing Signatures:** The specific information for the signatories has missing or inaccurate information for EPA. For EPA, please include/correct the following for the signatory line after Angeles Herrera: Assistant Director Federal Facilities and Site Cleanup Branch Superfund Division U.S. Environmental Protection Agency Region IX	We updated the signatory information for EPA.
3. (08/22/18)	**Table 2-1 Summary of Nature and Extent of Current Contamination – Site SS016, Page 2-5:** Table 2-1 references Section 3.2.1 and Table II-3.2 in the Final North East West Industrial Operable Unit (NEWIOU) Soil, Sediment, and Surface Water Record of Decision dated May 2006 (the 2006 NEWIOU ROD). However, the values listed in the 2006 NEWIOU ROD differ from those in the Draft NEWIOU RODA. For example, Table II-3-2 in the 2006 NEWIOU ROD lists a maximum concentration for benzo(a)pyrene of 3.75 milligrams per kilogram (mg/kg) while Table 2-1 lists the maximum as 3.8 mg/kg J-. Similarly, benzo(b)fluoranthene is listed as 9.06 mg/kg in Table II-3-2 and Table 2-1 shows 5.7 J-. In addition, the reviewers were unable to locate similar information in Attachment 2 of the Data Gap Investigation Results Technical Memorandum for Soil Site SS016 dated 2017. Please verify that the references to the 2006 NEWIOU ROD are correct and correct any inconsistencies with the Draft NEWIOU RODA.	The maximum concentration values of 3.8 mg/kg for benzo(a)pyrene and 5.7 mg/kg for benzo(b)fluoranthene are the maximum concentrations detected for each contaminant during the Data Gap Investigation (DGI). These sampling results are also included in Figure 2-1 of the ROD Amendment. Table 2-1 shows the maximum and minimum concentrations of each COC detected during the DGI sampling event. Attachment 2 (The Human Health Risk Assessment) was incorrectly referenced from the DGI technical memorandum. The sampling results are documented in Table 6 of the DGI technical memorandum, and the minimum and maximum results for each COC were included in Table 2-1 of the ROD Amendment. We revised the Source for Table 2-1 as follows: "*Data Gap Investigation Results Technical Memorandum for Soil Site SS016*, Table 6 (CH2M HILL, 2017)."
4. (08/22/18)	**Section 2.5, ROD Amendment Remedy Selection, Page 2-18:** The use of "unrestricted access" in the second paragraph of Section 2.5 is not consistent with terminology elsewhere. More consistent terminology should be considered such as "unlimited use and unrestricted exposure". Please revise the text to clarify "unrestricted access".	We revised the text in Section 2.5, second paragraph, now second sentence to read as follows: "Successful completion of these changes to the soil remedies will allow unlimited use and unrestricted exposure to the sites and will continue to achieve protective and legally compliant remedies for soil at Travis AFB."

No.	Comments	Responses
5. (08/22/18)	**Section 2.5, ROD Amendment Remedy Selection, Page 2-18:** The last sentence of Section 2.5 should elaborate on the Air Force responsibilities. For example, the text should be revised to include that the Air Force is responsible for implementing, maintaining, and monitoring the remedial actions (including the LUCs until they are removed) for the duration of the remedies selected in the Draft NEWIOU SSSW RODA. Please revise the text to include the suggested information.	We have revised the second to last sentence in the last paragraph of Section 2.5 as follows: "The Air Force is responsible for implementing, maintaining, and monitoring the remedial actions (including the LUCs until they are removed upon approval of this ROD Amendment for Site SD033 and with EPA and state concurrence upon achieving all RAOs for Site SS016) identified herein for the duration of the remedies selected in this ROD Amendment."
6. (08/22/18)	**Section 3, Basis for the Document, Page 3-1:** The discussion of Site SS016 should state that polycyclic aromatic hydrocarbon (PAHs) are the only contaminant of concern retained for this site. Please update this discussion to include this statement as part of the information supporting the update to the selected remedy for SS016.	We added the following statement as the second sentence in the fourth paragraph of Section 3: "PAHs are the only COCs retained for this site."
7. (08/22/18)	**Section 3, Basis for the Document, Page 3-1:** The text appears to imply that removal of LUCs will cause soil cleanliness. The fifth paragraph of Section 3 states that "upon removal of the LUCs, the site soil will be considered appropriate for unlimited use and unrestricted exposure", while the removal of LUCs does not automatically make the soil appropriate for UU/UE. Please revise the text to remove the correlation by association.	We revised the last sentence in the fifth paragraph as follows: "The site soil is considered appropriate for unlimited use and unrestricted exposure, and soil LUCs will be removed."
7a. (10/19/18)	**Response to Specific Comment 7:** The response partially addresses the comment. The response indicates that the text was revised to state "The site soil is considered appropriate for unlimited use and unrestricted exposure, and soil LUCs [land use controls] will be removed;" however, the site soil will not be appropriate for unlimited use and unrestricted exposure until the excavation activities have been completed. It might be helpful to change "site soil is" to "site soil will be" for clarity. Please revise the text to change "site soil is" to "site soil will be."	The excavation activities have been completed at Site SD033. No additional remedial action is required for this site. Thus, we believe the site soil is appropriate for unlimited use and unrestricted exposure. However, we have revised the last sentence in the fifth paragraph of Section 3 (Basis for the Document) as follows: "The site soil will be considered appropriate for unlimited use and unrestricted exposure upon approval of this ROD Amendment by EPA and the state, and soil LUCs will be removed."

No.	Comments	Responses
8. (08/22/18)	**Section 3, Basis for the Document, Page 3-1:** The last sentence of Section 3 does not define the site it is referencing. In addition, this sentence should be revised to clarify why UU/UE is appropriate for soil, sediment and surface water given these are soil remedies. Please revise the sentence to specify which site or sites is/are being referenced and clarify why UU/UE is appropriate for soil, sediment and surface water.	We revised the first and last sentences in the last paragraph of Section 3 as follows: "At Sites SS016 and SD033, under the currently selected ROD remedy of Alternative 17, LUCs are enforced to prohibit residential use of the property." "Sites SS016 and SD033 will be available for unlimited use and unrestricted exposure for soil." The last sentence in Section 3 incorrectly stated that Sites SS016 and SD033 will be available for unlimited use and unrestricted exposure for soil, sediment, and surface water. This ROD Amendment only addresses soil at both sites. At Site SS016, soil was the only media impacted, and at Site SD033, there were no impacts to sediment and surface water according to the Final NEWIOU SSSW ROD (Travis AFB, 2006).
9. (08/22/18)	**Section 4, Section 4.5.1, Page 4-5:** This section should include additional information related to the off-site disposal of the excavated soil. The text states that "excavated soil will be transported to an off-base landfill for proper disposal". However, the Draft NEWIOU SSSW RODA should specify that the Air Force will verify that the selected facility receiving the excavated soil is properly permitted to receive this waste and that the EPA Off-Site Rule Coordinator will be notified if the waste is determined to be Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) waste per Section 121(d)(3).	We added the following text as the fourth sentence in the first paragraph of Section 4.5.1. "The Air Force will verify that the selected off-base landfill receiving the excavated soil is properly permitted to receive this waste and will comply with all waste management ARARs as described in CERCLA Section 121(d)(3)."
9a. (02/27/19)	**Response to EPA Comments, Specific Comment 9:** The Off-Site rule is not considered an ARAR as it is a legal requirement that pertains to off-site actions and should not be confused with on-site waste management ARARs. We suggest the AF delete the portion of the response that refers to "all waste management ARARs."	We have revised the response to Specific Comment #9 and text pertaining to the fourth sentence in the first paragraph of Section 4.5.1 as follows: "The Air Force will verify that the selected off-base landfill receiving the excavated soil is properly permitted to receive this waste."
9b. (04/08/19)	**Review of Response to EPA 022719 Comments on the Draft NEWIOU RODA:** The AF has adequately responded to our comments with the exception of Specific Comment 9. EPA requested that the AF delete the portion of the sentence referring to "all waste management ARARs", but the AF deleted this portion in addition to the reference to the CERCLA Section 121(d)(3). We did not intend to request that the AF to remove the reference to CERCLA Section 121(d)(3). EPA suggests revising the sentence as follows: "The Air Force will verify that the selected off-base landfill receiving the excavated soil is properly permitted to receive this waste and will comply with CERCLA Section 121(d)(3)."	We have revised the fourth sentence that was added to the first paragraph of Section 4.5.1 as indicated in this comment. The sentence now reads as follows: "The Air Force will verify that the selected off-base landfill receiving the excavated soil is properly permitted to receive this waste and will comply with CERCLA Section 121(d)(3)."

No.	Comments	Responses
10. (08/22/18)	**Table 4-2, Summary Description of Selected Soil Remedies, Page 4-3:** Alternative 18 of Table 4-2 does not discuss how it will be determined that backfill materials used to fill the excavation void are suitable. For example, it is not clear if the backfill material will be sampled to confirm that the soil is uncontaminated and suitable for residential use. Please revise the text to include how backfill material will be selected.	We revised the last sentence in the first paragraph in Table 4-2, ROD Amendment column (for Site SS016 – OSA Area) as follows: "The excavation void is backfilled with clean, imported fill soil that will be sampled to confirm it is suitable for residential use prior to placement in the excavation void."
11. (08/22/18)	**Section 5.1.1.4 Reduction of Toxicity, Mobility, and Volume through Treatment:** This section is not consistent with the tables and other associated sections of the document, as the text of Section 5.1.1.4 indicates that there is greater compliance with reduction of mobility; however, this reduction is not achieved through treatment. Please clarify that neither alternative provides reduction of toxicity, mobility, and volume through treatment. In addition, remove the language indicating that Alternative 18 provides a greater degree of compliance than Alternative 17, as neither alternative provides for treatment.	We revised the first paragraph of Section 5.1.1.4 as follows: "For Sites SS016 and SD033, no reduction of toxicity, mobility, and volume through treatment occurs under Alternative 17 or 18."
12. (08/22/18)	**Section 5.1.1.7 Cost, Page 5-11, third paragraph:** The last sentence indicating that potential future costs cannot be quantified is not consistent with the other sections of the document, which quantify cost for both alternatives. This sentence should instead indicate that the long-term costs of continuing LUCs are greater than the short-term expense of excavation and disposal. Please update the document accordingly.	We revised the third sentence in the third paragraph of Section 5.1.1.7 as follows: "However, after years of enforcing LUCs at Site SS016 as well as other soil and groundwater sites, it became obvious that the long-term costs of continuing LUCs at an active military installation are greater than the short-term expense of excavation and disposal."
13. (08/22/18)	**Section 7.2 Compliance with ARARs, Page 7-1:** The second paragraph regarding off-site transfer should be removed from Section 7.2 and moved to another section, as it is considered a requirement that cannot be waived. Therefore, it is not considered an ARAR, but instead is a requirement of CERCLA that is necessary by statute.	We deleted the second sentence in the first paragraph of Section 7.2. We revised the first sentence in the first paragraph in the "ROD Amendment" column of Table 4-2 of Section 4.3 as follows: "Soil with contaminant concentrations greater than residential cleanup levels is excavated and transported by truck to an off-base EPA-approved facility."
14. (08/22/18)	**Section 7.6 Five (5)-Year Reviews:** This section indicates that a five (5)-year review would not be required because it is anticipated that the remedies are expected to be completed within the next 5 years, however the next review document covering the period that UU/UE was reached should still include a discussion regarding how these sites achieved UU/UE. Please add language to indicate that after UU/UE is achieved, the following five (5)-year review will note this development occurred within the 5 year period, and that the Sites will no longer be addressed in subsequent documents.	We revised the paragraph of Section 7.6 as follows: "Because these remedies are expected to be completed in less than five (5) years and will not result in hazardous substances remaining onsite at concentrations greater than levels that allow for unlimited use and unrestricted exposure, the next scheduled five (5)-year review will document the actions taken to achieve unlimited use and unrestricted exposure at the sites addressed in this ROD Amendment. Thus, subsequent five (5)-year reviews will not be required for the specific sites covered in this ROD Amendment. However, if unlimited use and unrestricted exposure status is not achieved within five (5) years of the date the ROD Amendment is signed, then a five (5)-year review will be completed in accordance with CERCLA and will evaluate the remedy status to verify that the remedy will be protective of human health and the environment."

No.	Comments	Responses
14a. (02/27/19)	**Response to EPA Comments, Specific Comment 14:** The portion of the response that refers to the situation where unlimited use and unrestricted exposure (UU/UE) status is not achieved within five (5) years, the text states that "a five (5)-year review will be completed". However, there could be additional reviews necessary as long as UU/UE is not obtained. We suggest modifying "a five (5)-year review" to "five (5)-year reviews."	We revised the response to Specific Comment 14 and the paragraph in Section 7.6 as follows: "Because these remedies are expected to be completed in less than five (5) years and will not result in hazardous substances remaining onsite at concentrations greater than levels that allow for unlimited use and unrestricted exposure, the next scheduled five (5)-year review will document the actions taken to achieve unlimited use and unrestricted exposure at the sites addressed in this ROD Amendment. Thus, subsequent five (5)-year reviews will not be required for the specific sites covered in this ROD Amendment. However, if unlimited use and unrestricted exposure status is not achieved within five (5) years of the date the ROD Amendment is signed, then five (5)-year reviews will be completed in accordance with CERCLA and will evaluate the remedy status to verify that the remedy will be protective of human health and the environment."
15. (08/22/18)	**Figure 1-1, Location of Sites SS016 and SD033:** The figure should display current LUC boundaries. Please revise the figure and legend to identify the current LUC boundaries of the two sites.	We have revised Figure 1-1 to include the current LUC boundaries.
16. (08/22/18)	**Table C-1 ARARs, Waste Management:** Since the pre-transport requirements of packaging, labeling, marking, and placarding relate to off-site actions that will be taken, and must already comply with regulations that cannot be waived, these activities should not be listed in the Description. Also, if the excavations take place over several weeks, it is assumed that staging areas for excavated material will be required. The ARARs table should include a citation addressing the appropriate on-site waste management requirements, such as 40 CFR 264.554(d), that will be followed for staging areas. There may also be an ARAR for fluids management, depending on the nature of management proposed (i.e., holding tank). Please ensure the appropriate ARARs for managing on-site materials of the excavated soils staging piles and any wash down fluids are included.	We removed the ARARs regarding packaging, labeling, marking, and placarding (22 CCR 66262.30, 66262.31, 66262.32, 66262.33) from Table C-1, Waste Management. However, we maintained ARAR 22 CCR 66262.34 (accumulation times) in Table C-1, Waste Management, and revised the Description as follows: "Defines accumulation times for onsite storage of RCRA hazardous waste." We added 40 CFR 264.554(d), Staging Piles, to Table C-1, Waste Management to address the staging pile requirements, standards, and design criteria. In the unlikely event that dewatering becomes necessary at SS016 OSA Area, groundwater will be collected and managed in the appropriate container. We added 22 CCR 66264.171 through 66264.175, 66264.177, 66264.178, Use and Management of Containers, to Table C-1, Waste Management to address the requirements of containers holding hazardous waste.
17. (08/22/18)	**Table D-2, Cost Estimate – Site SS016 OSA Area:** Table D-2 should provide more information related to the off-base disposal of excavated material. Specifically, information should be provided related to disposal at a California Class II landfill, including the name and date of the quote and the name of the proposed landfill. Additionally, transportation information should be provided. Please update the Draft NEWIOU SSW RODA to include this information.	We added a footnote to Table D-2 to indicate that the price for offsite transportation and disposal to a Class II landfill is based on quotes received in September 2018 from Bradley Tanks, Inc. and Recology Hay Road Landfill.

No.	Comments	Responses
17a. (10/19/18)	**Responses to General Comment 3 and Specific Comment 17:** The responses address the comments; however, the response to General Comment 3 indicates that "Costs were estimated using institutional experience on similar sites and actual costs from subcontractors in the vicinity of Travis AFB," so these sources should also be incorporated into the footnote that will be added to Table D-2 in response to Specific Comment 17. Please include the other sources of costing information in the footnote that will be added to Table D-2.	We have inserted the following text as note "e" in Table D-2 of Appendix D: "[e] Costs were estimated using institutional experience on similar sites and actual costs from subcontractors in the vicinity of Travis AFB. The September 2018 price is based on quotes obtained from Bradley Tanks, Inc. and Recology Hay Road Landfill in Vacaville, California."

Responses to Comments on the
Redline Draft Final Amendment to the North/East/West Industrial Operable Unit Soil, Sediment, and Surface Water Record of Decision,
Environmental Restoration Program Sites SS016 and SD033, September 13, 2019
Travis Air Force Base, California

Environmental Protection Agency Region IX

No.	Comments	Responses
REVIEW COMMENTS – Nadia Hollan Burke, EPA Region IX – dated September 26 and 27, 2019		
COMMENTS		
(09/26/19)	Unfortunately, the language added by the AF suggests LUCs will be retained as the selected remedy even after it issues the RODA. However, once the RODA is issued it supersedes the existing remedy, and there would be no requirement to maintain LUCs if only Alternative 18 is selected. In order to ensure LUCs will be required if RAOs are not met, the AF needs to clearly and consistently add Alternative 17 to the selected remedy. As another option, if the AF would like to maintain Alternative 18 as the remedy, and if RAOS are not achieved by the excavation, another ROD Amendment would then be necessary to select LUCs again as the remedy. A third option would be if the AF wanted to proceed with the excavation as a removal action instead of with this RODA, a no further action or LUCs ROD could be completed after we know whether UU/UE has been achieved with the removal action. We think that the first option would actually be much less time consuming as we are very close to being able to finalize this document, and it will result in less work down the road. Therefore, in order to add Alternative 17 as a contingency remedy, we have re-evaluated the portions of the RODA that would need to be modified, and have limited the amount of revisions necessary as much as possible. We also identified some other consistency issues. See our comments below:	Please see our responses to the 26 September 2019 EPA comments.

No.	Comments	Responses
1. (09/26/19)	The AF added language to Section 4.3 Descriptions of Alternatives, Section 4.5.1 Site SS016, and Section 8.1 last paragraph that includes the intention of the AF to maintain LUCs via Alternative 17 if the chosen remedy does not meet RAOs (UU/UE). However, unless the LUCs alternative is actually selected as a contingency remedy, there would be no legal requirement for LUCs to be maintained and Alternative 17 will not be the selected remedy. In order to ensure LUCs will still be a requirement of the remedy, and be consistent with the AF intention to maintain LUCs if RAOs are not achieved, the language selecting Alternative 18 needs to add Alternative 17 as a contingency. If the AF does not modify this ROD amendment to clearly select Alternative 17 as a contingency, the AF should modify the language added in these sections to remove the suggestion Alternative 17 or LUCs will be maintained if RAOS are not met, and to make clear that the original remedy no longer will be in place once the RODA is issued because it supersedes the existing remedy. In my last email, I initially identified several sections of the document that discuss Alternative 18 and 17, but after further review, not all of them are necessary to be changed in order to select Alternative 17 as a contingency. The sections that directly address remedy selection identified below need to be modified to properly select Alternative 17 as a contingency. a. Section 1.2 Statement of Purpose—Add Alternative 17 as contingency b. Section 2.5 ROD Amendment Remedy Selection-Add Alternative 17 as contingency c. Table 4-2 Summary Descriptions of Selected Soil Remedies- Add Alternative 17 as contingency d. Section 7.1 Protection of Human Health and the Environment—description of selected remedy to be modified to be consistent with above. e. Section 7.2 Compliance with ARARs- description of selected remedy to be modified to be consistent with above.	a. We revised the first bullet of Section 1.2 (Statement of Purpose) as follows: "Site SS016: Alternative 17 – Land Use Controls (LUCs) is changed to Alternative 18 – Excavation. In the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency. This remedy change does not modify the existing no action remedy for Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW." b. We revised the first bullet of Section 2.5 (ROD Amendment Remedy Selection) as follows: "Site SS016 OSA: Alternative 18 – Excavation. In the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency. This remedy change does not modify the existing no action remedy for Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW." c. We revised the last paragraph of the ROD Amendment column and the Site SS016 – OSA Area row of Table 4-2 (Summary Descriptions of Selected Soil Remedies: "No land use restrictions are required under Alternative 18. Risks posed by residual contaminant concentrations in soil are acceptable under a residential exposure scenario. Soil at the site is suitable for unlimited use and unrestricted exposure. In the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency." d. We revised the first bullet of Section 7.1 (Protection of Human Health and the Environment) as follows: "Site SS016, OSA Area – Excavation will be combined with off-base disposal under Alternative 18 to permanently achieve protectiveness. However, in the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency." e. We revised the first paragraph of Section 7.2 (Compliance with ARARs) as follows: "The selected soil remedy (Alternative 18 – Excavation) for Site SS016 is expected to achieve cleanup levels that permit unlimited use and unrestricted exposure (UU/UE) based on risk-based values for protecting human health and the environment. Alternative 18 is considered compliant with ARARs. In the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency.

No.	Comments	Responses
2. (09/26/19)	The AF added the following language to Sections 1.2 Statement of Purpose, 2.5 ROD Amendment Remedy Selection, Table 4-2 Footnote c "No prior remedial or removal actions have occurred at Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW of Site SS016. Thus, no action is necessary for soil and sediment in these areas." This was in response to EPA ORC comment 1a. However, looking at the context of where these sentences are placed, they do not seem to be appropriately located. The original intention of the comment was to clarify whether no further action vs. no action is needed for SD033. However, language was added regarding the SS016 facilities where we are not changing the remedy (no action remedy is not being modified.) Further, by using the word "thus" it indicates that no action is necessary because there was no previous actions, but no action is necessary because there is no unacceptable risk. Therefore, please delete the language that was added in these sections regarding SS016 as it's not relevant to selecting a remedy for the Oil Spill Area at SS016. If the AF needs a statement to clarify the remedy change does not address the other SS016 facilities, it can simply state that the existing no action remedy is not being modified for Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW. Also, Table 4-2 Footnote d does not appear to be within the actual table.	Please see the response to Comment #1a. Footnote "d" in Table 4-2 is located after "Alternative 16 – No Further Action" in the ROD Amendment column and the Site SD033 row.
3. (09/26/19)	Throughout the document, the expectation that the selected remedy will achieve UU/UE is indicated, however in some cases it's stated as will happen vs. expected to happen. If the AF decides to add Alternative 17 as a contingency remedy, in order for the document to be consistent, we suggest the following clarifications: a. Section 1.2, Page 1-2, third paragraph: "will allow for" to "expected to allow for" b. Section 3, Page 3-1, last paragraph: "Sites SS016 and SD033 will be available for unlimited use and unrestricted exposure for soil" to "Site SS016 would then be available for unlimited use and unrestricted exposure for soil." c. Section 4.5, first bullet: "and will result in" to "and is expected to result in"	a. We revised the last sentence of Section 1.2, Page 1-2, third paragraph as follows: "The changed soil remedial alternatives described in this ROD Amendment are expected to allow for unlimited use and unrestricted exposure to soil at Sites SS016 and SD033." b. We revised the last sentence of Section 3 (Basis for the Document) as follows: "Sites SS016 and SD033 would then be available for unlimited use and restricted exposure for soil." c. We revised the first bullet of Section 4.5 (Common Elements and Distinguishing Features of Each Alternative) as follows: "All newly selected alternatives are compatible with the intended site reuse and expected to result in the sites being suitable for unlimited use and unrestricted exposure."

No.	Comments	Responses
1. (09/27/19)	Regarding the citation for Title 22 CCR 67391.1 from DTSC comment #7, DTSC identifies it as applicable, however EPA and DoD typically cite it as relevant and appropriate. Also, although DTSC considers the entirety of 67391.1 to be an ARAR, EPA Region 9 considers only the following portions of the section to be relevant and appropriate: (a)(1), (a)(2), (d), (e)(1) and (e)(2), and in appropriate circumstances, sub-sections (f) (when it is not feasible to establish LUCs as a component of a remedy for a site) and (i) (definitions). EPA requests that the citation to 67391.1 only include those sections considered ARARs by EPA, but would accept the inclusion of standard agree-to-disagree language in the comment field: "EPA Region 9 considers the following portions of Cal. Code Regs. tit. 22 Section § 67391.1 to be relevant and appropriate for this ROD: (a)(1), (a)(2), (d), (e)(1) and (e)(2), and in appropriate circumstances, sub-sections (f) (when it is not feasible to establish LUCs as a component of a remedy for a site) and (i) (definitions). These requirements are ARARs for the LUCs. DTSC's position is that all of the state regulation is an ARAR."	We added Title 22 67391.1 (a)(1), (a)(2), (d), (e)(1), (e)(2), (f) and (i) to Table C-1 (Travis Air Force Base NEWIOU SSSW Sites – Waste Characterization, Classification, and Management ARARs). In the Remarks cell, we placed the following text: "EPA Region 9 and the Air Force consider the following portions of California Code of Regulations, Title 22, Section 67391.1 to be relevant and appropriate for this ROD Amendment: (a)(1), (a)(2), (d), (e)(1) and (e)(2), and in appropriate circumstances, sub-sections (f) (when it is not feasible to establish LUCs as a component of a remedy for a site) and (i) (definitions). These requirements are ARARs for the LUCs. DTSC's position is that all of the state regulation is an ARAR."
2. (09/27/19)	Please also add California Civil Code § 1471 as relevant and appropriate, as it is standard practice to cite this provision in decision documents including LUCs as a remedy component.	We added California Civil Code 1471(a) to Table C-1 (Travis Air Force Base NEWIOU SSSW Sites – Waste Characterization, Classification, and Management ARARs). In the Citation cell, we placed "Land Use Covenants". In the Section cell, we placed "California Civil Code 1471(a)". In the ARAR Determination cell, we placed "Relevant and Appropriate". In the ARAR Type cell, we placed "Action-specific". In the Description cell, we placed "Provides conditions for land use restrictions to run with the land and bind successive owners". In the Remarks cell, we placed the following text: "**Joint AF and State comments:** Civil Code §1471(a) is a potential ARAR for the scope of land use controls described in the ROD that would apply to a nonfederal transferee of a site that does not allow for unrestricted use. **AF comments:** Civil Code §1471(b)-(d) is not a potential ARAR because it does not address the responsibilities of AF. Civil Code §1471(b)-(d) addresses the extent to which land use covenants are binding on transferees and their successors." In the Sites and Alternatives cell, we placed "Site SS016: 17 – Land Use Controls"

Responses to Comments on the
Draft Amendment to the North/East/West Industrial Operable Unit Soil, Sediment, and Surface Water Record of Decision,
Environmental Restoration Program Sites SS016 and SD033, June 22, 2018
Travis Air Force Base, California

Department of Toxic Substances Control

No.	Comments	Responses
REVIEW COMMENTS – Ben Fries, Department of Toxic Substances Control – dated August 28, 2018		
GENERAL COMMENTS		
1.	DTSC staff reviewed this document and had no comments.	No response necessary.

Responses to Comments on the
Draft Amendment to the North/East/West Industrial Operable Unit Soil, Sediment, and Surface Water Record of Decision,
Environmental Restoration Program Sites SS016 and SD033, June 22, 2018
Travis Air Force Base, California

Department of Toxic Substances Control

No.	Comments	Responses
REVIEW COMMENTS – Dominique Forrester, Department of Toxic Substances Control – dated May 6, 2019		
COMMENTS		
1.	Section 2.3, Summary of Site Risks - Section states that the human health risk assessment (HHRA) for Sites SS016 and SD033 was updated in 2017. The update was a result of a data gap investigation conducted in 2016 to evaluate the current extent of soil contamination and to support reevaluation of human health risks to consider a residential exposure scenario that will provide risk managers *with information necessary to assist in making remedial decisions and meeting risk management goals* (italicized for emphasis). DTSC does not agree that the information necessary to assist in making remedial decisions and meeting risk management goals is available within the updated HHRAs for Sites SS016 and SD033 because the HHRAs are not consistent with the recently promulgated Toxicity Criteria Regulation (TCR). The State of California Office of Administrative Law approved Title 22, California Code of Regulations Section 68400.5, 69020, 69021, and 69022, *Toxicity Criteria for Human Health Risk Assessments, Screening Levels, and Remediation Goals* (Toxicity Criteria Regulation or Rule; TCR as defined above) which became effective on 4 September 2018. The TCR adopts Office of Environmental Health Hazard Assessment (OEHHA) toxicity criteria listed in Appendix I of the rule and requires their use because they afford greater protection of human health, safety and the environment than the nationwide minimum standard provided by analogous federal toxicity criteria for the same contaminants (e.g., USEPA Integrated Risk Information System [IRIS]). Appendix I, Table A of the TCR list required toxicity criteria for specific chemicals and Table B provides the benchmark incremental change in blood lead concentration, which are to be used in human health risk assessments, human health risk-based screening levels and human health risk-based remediation goals (cleanup levels) (https://www.dtsc.ca.gov/LawsRegsPolicies/Regs/upload/Final-Toxicity-Criteria-Rule-Rule-Text-Appdx-2018-09-04-clean.pdf).	We revised the second sentence of Note "a" in Table 2-3 as follows: "DTSC evaluated the risks in accordance with California's Toxicity Criteria Rule, Sections 69021 and 69022(a), and noted that the risks slightly increased; however, they are still within the risk range."

No.	Comments	Responses
	DTSC-Human and Ecological Risk Office (HERO) reviewed the updated HHRAs for Sites SS016 and SD033. DTSC-HERO determined several analytes are not currently using the required TCR. DTSC-HERO re-calculated the cancer risks and hazard indices for Sites SS016 and SD033 to help determine what compliance levels should be used in the Draft NEWIOU RODA and to ensure that the ROD Amendment is compliant with DTSC's September 2018 TCR. Please see the attached memo from DTSC-HERO dated 17 April 2019 and modify the Draft NEWIOU RODA Section 2.3 as follows: a. Please revise the Draft NEWIOU RODA so that the cancer risk and noncancer hazard estimates for all applicable chemicals of concern (COCs) are based on the recently promulgated TCR per the DTSC-HERO comment memorandum dated 17 April 2019. b. Please include a discussion within Section 2.3, (i.e., Sections 2.3.1.2 and 2.3.1.3) describing the revised risk calculation approach which incorporates the recently promulgated TCR. c. Please note within Table 2-3 and Table 2-4 that cancer risk and noncancer hazard estimates are based on the recently promulgated TCR. DTSC notes that for Site SD033, chromium and arsenic were excluded as site-related COCs. The Air Force stated that the detections of both arsenic and chromium are considered to not be related to past site activities. Additionally, the risk associated with chromium was calculated using the hexavalent chromium screening levels which is a conservative approach. DTSC reviewed historical data from the *Travis AFB WABOU ROD* which included the Maximum Inorganic Reference Concentrations at Travis AFB. The Maximum Inorganic Reference Concentration of arsenic in subsurface soil identified in the WABOU ROD is 26.6 milligrams per kilogram (mg/kg). This is close to the arsenic exposure point concentration (EPC) of 27.4 mg/kg identified as a risk driver at Site SD033. DTSC management concurs that arsenic concentrations at Site SD033 can be attributed to naturally occurring background concentrations and that both arsenic and chromium can be excluded from Site SD033 as site-related COCs. **Note:** DTSC reviewed updated HHRAs contained in the following documents: • *Final Data Gap Investigation Results Technical Memorandum for Soil Sites SD033, SD043 and SS046* (CH2M HILL 2018). • *Final Site SS016 Data Gap Investigation Results Technical Memorandum* (CH2M HILL 2018).	

No.	Comments	Responses
2.	Section 4.2 Soil Cleanup levels - Please include a discussion describing the revised compliance levels which were derived based on the recently promulgated TCR. Please include a reference in Table 4-1 to note that the soil cleanup levels were calculated based on the recently promulgated TCR. Please revise Table 4-1 compliance levels based on the DTSC-HERO comment memorandum dated 17 April 2019.	We revised the residential soil cleanup concentrations for dibenz(a,h)anthracene (0.028 mg/kg) and naphthalene (2 mg/kg), based on this comment. We also revised Note "b" in Table 4-1 as follows: "This number is derived from applying California's OEHHA toxicity value only at this site. DTSC and the Air Force disagree whether California's Toxicity Criteria Rule (Title 22, CCR Sections 68400.5, 69020, 69021, and 69022) is an Applicable or Relevant and Appropriate Requirement (ARAR) and will pursue resolution of that disagreement as part of a pending dispute at another location. Use of California's OEHHA toxicity values to show achievement of UU/UE at this site will not affect either DTSC's or the Air Force's respective positions on California's Toxicity Criteria Rule in any other context or in any dispute resolution process."
3.	Section 7 .1 Protection of Human Health and the Environment - Please include a reference to DTSC-HERO's re-calculated risk evaluation for Sites SS016 and SD033 within this Section.	We revised the first sentence of Section 7.1 as follows: "Protection of human health and the environment for the sites in this ROD Amendment will be achieved by eliminating exposure to contaminants by cleaning up to levels acceptable for unlimited use and unrestricted exposure (see Table 4-1)."
4.	Section 7.2 Compliance with ARARs - DTSC suggests adding the following language to Section 7.2: "**California Department of Toxic Substances Control's Position Regarding California's Toxicity Criteria Regulations (Title 22, CCR Sections 68400.5, 69020, 69021, and 69022):** The Department of Toxic Substances Control has identified California's Toxicity Criteria Regulation or Rule (Title 22, CCR Sections 68400.5, 69020, 69021, and 69022) as an ARAR for all human health risk assessments, human health risk-based screening levels, and human health risk-based remediation goals for all sites at Travis AFB. The California Toxic Criteria Rule (TCR, effective September 4, 2018) requires the use of OEHHA toxicity values listed in its Appendix I, and IRIS values for all other toxicity criteria, for screening and remediation of hazardous waste and hazardous substance release sites in California, codifies existing DTSC policy and practices, and is enforceable statewide." Please also include the Air Force's position regarding California's Toxicity Criteria Regulations to this section.	We added the following footnote to the first paragraph of Section 7.2: "DTSC and the Air Force disagree whether California's Toxicity Criteria Rule (Title 22, CCR Sections 68400.5, 69020, 69021, and 69022) is an ARAR and will pursue resolution of that disagreement as part of a pending dispute at another location. Use of California toxicity values for two chemicals to show achievement of UU/UE at this site will not affect either DTSC's or the Air Force's respective positions on California's Toxicity Criteria Rule in any other context or in any dispute resolution process."

No.	Comments	Responses
5.	Appendix C, Summary of ARARs - Upon review of the applicable or relevant and appropriate requirements (ARARs) table in Appendix C of the Draft NEWIOU RODA, DTSC notes that the recently promulgated TCR is not included. DTSC does not concur with excluding the TCR. Please add another ARARs table (Chemical-specific) and edit the cells as follows: a. Within the "Citation" column, please state: "22 CCR 68400.5, 69020, 69021, and 69022"; b. Within the "ARAR determination" column, please state: "Applicable*"; c. Within the "ARAR Type" column, please state: "Chemical-Specific"; d. Within the "Description" column, please state: "Criteria for establishing cleanup goals. All human health risk assessments, human health risk-based screening levels, and human health risk-based remediation goals for applicable site COCs shall protect human health"; e. Within the "Remarks" column, please state: 'The Air Force and State disagree on the ARAR status of the California Toxic Criteria Rule (TCR). The TCR became effective September 4, 2018 and requires the use of OEHHA toxicity values listed in its Appendix I, and IRIS toxicity values for all other toxicity criteria, for screening and remediation of hazardous waste and hazardous substance release sites in California. The TCR also requires cleanups provide the protection afforded from use of the TCR's Appendix I and IRIS values, codifies existing DTSC policy and practices, and is enforceable statewide. DTSC's position is that the TCR is applicable and/or relevant and appropriate, because the TCR is enforceable statewide; provides substantive, health-protection and chemical-specific numbers from which cleanup levels and cleanup goals derive; and provides a narrative cleanup standard for protection of human health. [PLEASE ADD THE AIR FORCE'S POSITION HERE]. [After including Air Force's position, DTSC suggests including the following agree-to-disagree language:] While the Air Force's position is that the TCR is not an ARAR, inasmuch as the identification of the TCR as an ARAR will not impact NEWIOU RODA Site SS016 and SD033 remedy designs and construction, and compliance with other more specific ARARs identified in these tables will achieve substantive compliance with the TCR, the TCR is identified by the Air Force as relevant and appropriate. The Air Force's acquiescence in this ROD amendment to the identification of the TCR as relevant and appropriate is without prejudice to its right to contest it subsequently in other Travis actions and elsewhere in California. The Parties expressly reserve their respective positions but expect that the selected remedial actions and compliance with other identified chemical- and action-specific ARARs will achieve substantive compliance with the TCR."; and f. Within the "Sites and Alternatives" column, please state: "All sites and alternatives.".	We added the following footnote to the first paragraph of Section 7.2: "DTSC and the Air Force disagree whether California's Toxicity Criteria Rule (Title 22, CCR Sections 68400.5, 69020, 69021, and 69022) is an ARAR and will pursue resolution of that disagreement as part of a pending dispute at another location. Use of California toxicity values for two chemicals to show achievement of UU/UE at this site will not affect either DTSC's or the Air Force's respective positions on California's Toxicity Criteria Rule in any other context or in any dispute resolution process."

No.	Comments	Responses
	g. Add a "*" note which reads: "The Air Force and State disagree on the ARAR status of the Toxicity Criteria Regulation. See Section 7.2 Compliance with ARARs for additional details." **Note:** DTSC's Office of Legal Counsel (OLC) provided review of the Draft NEWIOU RODA which was transmitted to Travis AFB on 3 August 2018, prior to promulgation of the Toxicity Criteria rule. Therefore, OLC's prior commentary should be considered with this caveat.	
REVIEW COMMENTS – Kimberly Day Gettmann, Ph.D. Staff Toxicologist, Human and Ecological Risk Office (HERO), Department of Toxic Substances Control – dated May 6, 2019 (attachment)		
COMMENTS		
1.	Site SS016. The HHRA based on DTSC's Toxicity Criteria Rule shows the following: a. **Cancer** i. Residential Surface Soil (Table 1). The estimated cancer risk associated with exposure to the chemicals in the surface soil under the residential land use scenario is 3E-05, greater than the DTSC point of departure but within the risk management range of 1E-06 to 1E-04. The risk drivers are benzo(a)pyrene, dibenz(a,h)anthracene, benzo(a,h)anthracene, and benzo(a)anthracene, respectively. ii. Residential Mixed Soil (Table 2). The estimated cancer risk associated with exposure to the chemicals in the mixed soil under the residential land use scenario is 5E-06, greater than the DTSC point of departure but within the risk management range of 1E-06 to 1E-04. The risk drivers are benzo(a)pyrene and dibenz(a,h)anthracene. iii. Industrial Surface Soil (Table 3). The estimated cancer risk associated with exposure to the chemicals in the surface soil under the residential land use scenario is 3E-06, greater than the DTSC point of departure but within the risk management range of 1E-06 to 1E-04. The risk driver is benzo(a)pyrene. b. **Noncancer.** The estimated noncancer hazard associated with surface soil (0 to 2 feet bgs) and mixed soil (0 to 10 feet bgs) is less than 1 for the residential and industrial land use scenarios, indicating that adverse health effects from exposure to soil would not be expected (Tables 1, 2, and 3).	We revised the second sentence of Note "a" in Table 2-3 as follows: "DTSC evaluated the risks in accordance with California's Toxicity Criteria Rule, Sections 69021 and 69022(a), and noted that the risks slightly increased; however, they are still within the risk range."

No.	Comments	Responses
2.	SD033. The HHRA based on DTSC's Toxicity Criteria Rule shows the following: a. **Cancer** i. Residential Surface Soil (Table 5). The estimated cancer risk associated with exposure to the chemicals in the surface soil under the residential land use scenario is 4E-04, greater than the risk management range of 1E-06 to 1E-04. The risk drivers are arsenic and chromium. If arsenic and chromium are excluded from the risk assessment, the estimated cancer risk is 1E-06. The Air Force excluded arsenic and chromium. The Air Force stated that the detections of both arsenic and chromium are considered to not be related to past site activities. Additionally, the risk associated with chromium was calculated using the hexavalent chromium screening levels which is a conservative approach. Thus, these chemicals were not carried forward and identified as chemicals as chemicals of concern (COCs) for SD033. HERO defers to DTSC management regarding the exclusion of these two chemicals as COCs. ii. Residential Mixed Soil (Table 6). The estimated cancer risk associated with exposure to the chemicals in the mixed soil under the residential land use scenario is 2E-04, greater than the risk management range. The risk drivers are arsenic and chromium. If arsenic and chromium are excluded from the risk assessment the estimated cancer risk is 5E-07, less than DTSC's point of departure of 1E-06. Please see the discussion in Comment 2a regarding the exclusion of arsenic and chromium as site-related COCs. iii. Industrial Surface Soil (Table 7). The estimated cancer risk associated with exposure to the chemicals in the surface soil under the industrial land use scenario is 8E-05, greater than the DTSC point of departure but within the risk management range. The risk drivers are arsenic and chromium. If arsenic and chromium are excluded from the risk assessment the estimated cancer risk is 1E-07, less than DTSC's point of departure. Please see the discussion in Comment 2a regarding the exclusion of arsenic and chromium as site-related COCs. b. **Noncancer** i. Residential Surface Soil (Table 5). The estimated noncancer hazard index associated with exposure to the chemicals in the surface soil under the residential land use scenario is 70, greater than the target hazard index of 1. The risk drivers are arsenic and chromium. If arsenic and chromium are excluded from the risk assessment, the estimated noncancer hazard index is 1. A target organ analysis is shown in Table 5. The target organ analysis shows that each target organ specific hazard index is less than 1. Please see the discussion in Comment 2a regarding the exclusion of arsenic and chromium as site-related COCs.	Section 2.3.1.3 addresses the exclusion of arsenic and chromium from the list of chemicals of concern for Site SD033.

No.	Comments	Responses
	ii. Residential Mixed Soil (Table 6). The estimated noncancer hazard index associated with exposure to the chemicals in the mixed soil under the residential land use scenario is 30, greater than the target hazard index of 1. The risk driver is arsenic. If arsenic is excluded from the risk assessment, the estimated noncancer hazard index is 2. A target organ analysis is shown in Table 6. The target organ analysis shows that each target organ specific hazard index is less than 1. Please see the discussion in Comment 2a regarding the exclusion of arsenic and chromium as site-related COCs. iii. Industrial Surface Soil (Table 7). The estimated noncancer hazard index associated with exposure to the chemicals in the surface soil under the industrial land use scenario is 7, greater than the target hazard index of 1. The risk driver is arsenic. If arsenic is excluded from the risk assessment, the estimated noncancer hazard index is 0.1, less than 1. Please see the discussion in Comment 2a regarding the exclusion of arsenic and chromium as site-related COCs.	
3.	A summary of the cancer risks and noncancer hazards for Sites SS016 and SD033 is presented in Tables 4 and 8, respectively.	Tables 2-3 and 2-4 summarize the cancer and noncancer risk assessments associated with Sites SS016 and SD033, respectively.
4.	For Site SS016, the Draft ROD Amendment recommends changing the selected Alternative from land use controls (LUCs) to excavation of the Oil Spill Area (OSA). For surface soil under the residential and industrial land use scenario, and mixed soil under the residential land use scenario, when the HHRA complies with the Toxicity Criteria Rule, the cancer risk is slightly greater than the risk presented in the June 2018 Technical Memorandum. Under both assessments, the risk drivers are the polycyclic aromatic hydrocarbons (PAHs) detected in the soil.	We revised the second sentence of Note "a" in Table 2-3 as follows: "DTSC evaluated the risks in accordance with California's Toxicity Criteria Rule, Sections 69021 and 69022(a), and noted that the risks slightly increased; however, they are still within the risk range."
5.	For Site SD033, the Draft ROD Amendment recommends changing the selected Alternative from LUCs to no action for soil and sediment. If arsenic and chromium are excluded as site related COCs, the cancer risk for the residential and industrial land use scenarios is at or less than the point of departure, 1E-06. In summary, when the HHRA complies with the Toxicity Criteria Rule and arsenic and chromium are included: 1) the cancer risk is slightly greater than the risk presented in the February 2018 Technical Memorandum; and 2) the noncancer hazard index is substantially greater than noncancer hazard presented in the February 2018 Technical Memorandum. Please see the discussion in Comment 2a regarding the exclusion of arsenic and chromium as site related COCs.	Section 2.3.1.3 addresses the exclusion of arsenic and chromium from the list of chemicals of concern for Site SD033.

No.	Comments	Responses
6.	Table 4-1 of Draft ROD Amendment – Summary of Soil Cleanup Levels. Please note, the soil cleanup levels listed for SS016 for naphthalene and dibenz(a,h)anthracene in Table 4-1 are not in compliance with the Toxicity Criteria Rule. HERO recommends soil cleanup levels of 2.0 mg/kg for naphthalene and 0.028 mg/kg for dibenz(a,h)anthracene.	We revised the residential soil cleanup concentrations for dibenz(a,h)anthracene (0.028 mg/kg) and naphthalene (2 mg/kg), based on this comment. We also revised Note "b" in Table 4-1 as follows: "This number is derived from applying California's OEHHA toxicity value only at this site. DTSC and the Air Force disagree whether California's Toxicity Criteria Rule (Title 22, CCR Sections 68400.5, 69020, 69021, and 69022) is an Applicable or Relevant and Appropriate Requirement (ARAR) and will pursue resolution of that disagreement as part of a pending dispute at another location. Use of California's OEHHA toxicity values to show achievement of UU/UE at this site will not affect either DTSC's or the Air Force's respective positions on California's Toxicity Criteria Rule in any other context or in any dispute resolution process."

Responses to Comments on the
Redline Draft Final Amendment to the North/East/West Industrial Operable Unit Soil, Sediment, and Surface Water Record of Decision, Environmental Restoration Program Sites SS016 and SD033, September 13, 2019
Travis Air Force Base, California

Department of Toxic Substances Control

No.	Comments	Responses
REVIEW COMMENTS – Dominique Forrester, Department of Toxic Substances Control – dated September 26, 2019		
COMMENTS		
1. (09/26/19)	**Sections 1.2, 2.5, and Table 4-2 note "c", are inconsistent with Section 7.1:** Sections 1.2, 2.5, and Table 4-2 note "c", indicate that no action is necessary for soil and sediment in portions of Site SS016 (Facilities 11, 13/14, 20, 42/1941, 139/44, and SSRW) because no prior remedial or removal actions have occurred. However, Section 7.1 indicates that no action is required in these portions of Site SS016 for soil due to evaluations performed in an HHRA Tech Memo from 2017. Please clarify why Facilities 11, 13/14, 20, 42/1941, 139/44, and SSRW of Site SS016 do not require action and ensure consistency throughout the document. If the remedy remains the same for these portions of Site SS016 from the original Travis NEWIOU ROD to the ROD Amendment, why are they even being discussed? Further, Sections 1.2, 2.5, and Table 4-2 note "c", should clarify that the excavation, Alternative 18 at the Site SS016 OSA, is being conducted to achieve UU/UE for soil only, as described in the last sentence at the end of Section 3.	a. We revised the first bullet of Section 1.2 (Statement of Purpose) as follows: "Site SS016: Alternative 17 – Land Use Controls (LUCs) is changed to Alternative 18 – Excavation. In the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency. This remedy change does not modify the existing no action remedy for Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW." b. We revised the first bullet of Section 2.5 (ROD Amendment Remedy Selection) as follows: "Site SS016 OSA: Alternative 18 – Excavation. In the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency. This remedy change does not modify the existing no action remedy for Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW." c. We revised note "c" of Table 4-2 (Summary Descriptions of Selected Soil Remedies as follows: "This ROD Amendment does not modify the existing no action remedy for Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW." d. We added the following text to the second bullet of Section 7.1 (Protection of Human Health and the Environment): "This ROD Amendment does not modify the existing no action remedy for Facilities 11, 13/14, 20, 42/1941, 139/144, and SSRW." We also added "SSRW" to the title of this bullet.
2. (09/26/19)	**Section 2.3.1.2, Table 2-3, Note "a":** Please revise "DTSC Toxicity Rule" to read "California's Toxicity Criteria Rule" for consistency.	We revised the second sentence of Note "a" in Table 2-3 as follows: "DTSC evaluated the risks in accordance with California's Toxicity Criteria Rule, Sections 69021 and 69022(a), and noted that the risks slightly increased; however, they are still within the risk range."

No.	Comments	Responses
3. (09/26/19)	**Section 4.2, Table 4-1, Note "b":** Please revise "Use of this number to show achievement of UU/UE at this site…" to read "Use of California's OEHHA toxicity values to show achievement of UU/UE at this site…" for consistency (i.e., replace "this number" with "California's OEHHA toxicity values").	We revised the third sentence of Note "b" in Table 4-1 as follows: "Use of California's OEHHA toxicity values to show achievement of UU/UE at this site will not affect either DTSC's or the Air Force's respective positions on California's Toxicity Criteria Rule in any other context or in any dispute resolution process."
4. (09/26/19)	**Section 4.3:** Please delete the last sentence in the second paragraph which states, "Once the Site SS016 RAOs are achieved…" as it is redundant and already stated in the second sentence of this same paragraph.	We deleted the last sentence of the second paragraph in Section 4.3 (Description of Alternatives).
5. (09/26/19)	**Section 4.3, Table 4-2:** Please revise this section under Alternative 18 to read, "Soil with contaminant concentrations greater than residential cleanup levels, as determined by confirmation sampling, is excavated and transported by truck to an off-base EPA-approved facility." Please include a sentence that reads, "In the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency." as described in Section 4.5.1.	We revised the first paragraph that describes Alternative 18 in the ROD Amendment column for Site SS016 – OSA Area as follows: "Soil with contaminant concentrations greater than residential cleanup levels, as determined by confirmation sampling, is excavated and transported by truck to an off-base EPA-approved facility. The excavation void is backfilled with clean, imported fill soil that will be sampled to confirm it is suitable for residential use prior to placement in the excavation void. In the event implementation of Alternative 18 does not result in residential cleanup levels for soil, Alternative 17 will be implemented as a contingency."
6. (09/26/19)	**Section 4.5, first bullet:** In the event Alternative 18 does not result in residential cleanup levels for soil, please replace "will" with "expected to" so that the first bullet reads, "All newly selected alternatives are compatible with the intended site reuse and expected to result in the sites being suitable for unlimited use and unrestricted exposure."	We revised the first bullet of Section 4.5 as follows: "All newly selected alternatives are compatible with the intended site reuse and expected to result in the sites being suitable for unlimited use and unrestricted exposure."
7. (09/26/19)	**Appendix C:** Since implementation of Alternative 18 may not achieve residential cleanup levels for soil at Site SS016 and Alternative 17 (LUCs) has been identified as a contingency remedy, Title 22 CCR 67391.1 should be included in the ARARs table as an applicable ARAR.	We added Title 22 CCR 67391.1 (a)(1), (a)(2), (d), (e)(1), (e)(2), (f) and (i) to Table C-1 (Travis Air Force Base NEWIOU SSSW Sites – Waste Characterization, Classification, and Management ARARs). In the Remarks cell, we placed the following text: "EPA Region 9 and the Air Force consider the following portions of California Code of Regulations, Title 22, Section § 67391.1 to be relevant and appropriate for this ROD Amendment: (a)(1), (a)(2), (d), (e)(1) and (e)(2), and in appropriate circumstances, sub-sections (f) (when it is not feasible to establish LUCs as a component of a remedy for a site) and (i) (definitions). These requirements are ARARs for the LUCs. DTSC's position is that all of the state regulation is an ARAR."

No.	Comments	Responses
8. (09/26/19)	**Appendix E:** The responses provided by the AF for comments made by DTSC are extremely vague and lack transparency. To simply state "We have revised and updated the text and tables according to the direction provided by Air Force and regulatory counsels" and "Comment noted" provides no context or information for the public to understand how the Air Force and DTSC came to resolution, without the redline being available. While these responses may be appropriate for some comments, please include a description as to how the ROD Amendment was modified to address DTSC concerns. For example an appropriate response to Comment No. 2 would include reference to Table 4-1, note "b", an appropriate response to Comment No. 4 would include reference to footnote "1" in Section 7.2, etc.	We revised the Air Force responses to DTSC comments to reflect the text changes to the Amendment based on the comments.

Responses to Comments on the
Draft Amendment to the North/East/West Industrial Operable Unit Soil, Sediment, and Surface Water Record of Decision, Environmental Restoration Program Sites SS016 and SD033, June 22, 2018
Travis Air Force Base, California

Regional Water Quality Control Board

No.	Comments	Responses
REVIEW COMMENTS – Adriana Constantinescu, P.G., Regional Water Quality Control Board – E-mail dated August 22, 2018		
GENERAL COMMENTS		
In Appendix C, Summary of Applicable or Relevant and Appropriate Requirements (ARARs), we identified the following State laws and policies applicable to the selected remedy for Site SS016 – Oil Spill Area that should be included in Table C-1:		
1.	RWQCB-SFB Basin Plan (the Basin Plan), Chapter 2 – Beneficial Uses and Chapter 3 – Water Quality Objectives (Chapter 2 describes beneficial uses of surface and ground waters and Chapter 3 establishes water quality objectives, including narrative and numerical standards that protect the beneficial uses and water quality objectives of surface and ground waters in the region. This ARAR applies where any activity, including, but not limited to the discharge of contaminated soils must not result in actual water quality exceeding water quality objectives.	ARARs presented in Appendix C of the ROD Amendment have been discussed, reviewed, and revised according to conversations conducted with the Air Force, EPA, and Water Board legal departments.
2.	SWRCB Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality Waters in California (Anti- Degradation Policy) establishes policy that whenever the existing water quality is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated that any change will be consistent with the maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than prescribed in the policies. It applies to sites where discharges of contaminants to the soil or soil action have potential to cause active discharges to surface waters and groundwater. In-situ cleanup levels for contaminated soils must be set so that groundwater will not be degraded, unless degradation is consistent with the maximum benefit of the people of the state. If degradation is allowed, the discharge must meet best practical treatment or control standards, and result in the highest water quality possible consistent with the maximum benefit to the people of the state. In no case may water quality objectives be exceeded.	ARARs presented in Appendix C of the ROD Amendment have been discussed, reviewed, and revised according to conversations conducted with the Air Force, EPA, and Water Board legal departments.

No.	Comments	Responses
3.	SWRCB Resolution 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code 13304 establishes requirements for investigation and cleanup and abatement of discharges. It applies to all cleanups of wastes to soil that threatens or may affect the quality of ground or surface water.	ARARs presented in Appendix C of the ROD Amendment have been discussed, reviewed, and revised according to conversations conducted with the Air Force, EPA, and Water Board legal departments.
4.	SWRCB Resolution 88-63, Sources of Drinking Water Policy, as contained in the Basin Plan, specifies that, with certain exemptions, all ground and surface waters must have the beneficial use of municipal or domestic supply. It applies to soil actions that will result in a discharge to groundwater or surface water.	ARARs presented in Appendix C of the ROD Amendment have been discussed, reviewed, and revised according to conversations conducted with the Air Force, EPA, and Water Board legal departments.
5.	Title 27, CCR, Division 2, Subdivision 1 (Section 20080 et seq.) and Title 23, CCR, Division 3, Chapter 15, (Section 2510 et seq.). It applies to all discharges of waste to land for treatment, storage, or disposal that may affect water quality. Provisions of Title 23 apply to hazardous waste and provisions of Title 27 apply to designated and non-hazardous waste.	ARARs presented in Appendix C of the ROD Amendment have been discussed, reviewed, and revised according to conversations conducted with the Air Force, EPA, and Water Board legal departments.
6.	Title 23, CCR, Sections, 2520 and 2521 and Title 27, CCR, Sections, 20200(c), 20210 require that designated waste be discharged to Class I or Class II waste management units. It applies to discharges of designated waste (nonhazardous waste that could cause degradation of surface or ground waters) to land for treatment, storage, or disposal.	ARARs presented in Appendix C of the ROD Amendment have been discussed, reviewed, and revised according to conversations conducted with the Air Force, EPA, and Water Board legal departments.
7.	In Table C-2, please include a reference to the NPDES General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) Order No. 2013-0001-DWQ, under which Travis AFB is a permittee.	We included NPDES General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) Order No. 2013-0001-DWQ as a to-be-considered requirement in Table C-3. Because excavation is considered construction and the total area disturbed is less than 1 acre, the Construction General permit would be an applicable requirement.
SPECIFIC COMMENTS		
1.	Table 2-1, Summary of Nature and Extent of Current Contamination – Site SS016, page 2-5, should include for document clarity a note with the screening criteria values used, i.e., EPA, 2016, RSLs.	We added the following information to the notes section of Table 2-1: "Detected concentrations were compared to the EPA residential RSLs (EPA, 2018).
2.	Table 2-2, Summary of Nature and Extent of Current Contamination – Site SD033, page 2-8, should include for document clarity a note with the screening criteria values used, i.e., EPA, 2018, RSLs.	We added the following information to the notes section of Table 2-2: "Detected concentrations were compared to the EPA residential RSLs (EPA, 2018).
3.	Figures 2-2 and 2-3, Site SD033 West Side and East Side Site Features and Soil Sample Locations: The outline of Site SD033 should be presented on the figures.	We have revised Figures 2-2 and 2-3 to include the entire site boundary for ERP Site SD033.

No.	Comments	Responses
4.	Section 4.4, Descriptions of Remedy Components, page 4-4: Although no monitoring activities are planned for the Site SS016 as indicated in Table 4-3, the table should include the statement that confirmation sampling is planned to take place following the excavation.	We added the following text to Table 4-3 as note "b": "Following excavation of contaminated soil, confirmation soil samples will be collected to verify that the impacted soil has been removed. Thus, monitoring is not required."
ADDITIONAL COMMENTS – Dated October 31, 2018		
1.	Table C-3, in the third column titled ARAR Determination (third column), we do not agree with the qualifier See Remarks for the rows referencing RWQCB-SFB Basin Plan – Chapters 2 and 3, State Resolutions No. 68-16, 88-63, and 92-49, CCR - Title 27, Division 2, Subdivision 1 and Sections 20200(c) and 20210, Title 23, Division 3, Chapter 15 and Sections 2520 and 2521. To ensure consistency in the ARARs tables and in the future approach of these issues across the remedy decision documents, we recommend the use of the language from the 2014 Groundwater ROD, such as "Applicable", "Appropriate and Relevant", or to be considered (TBC).	ARARs presented in Appendix C of the ROD Amendment have been discussed, reviewed, and revised according to conversations conducted with the Air Force, EPA, and Water Board legal departments.
2.	Table C-3 and RTC #1, the section identified as Chapter 2 - Beneficial Uses, the paragraph titled State Comments should include, in the middle of the paragraph, the following language: "The beneficial uses are the key to identifying numeric standards necessary to protect the uses. ARARs are defined in CERCLA as "standard, requirement, criteria, or limitation." It says nothing about "numeric standards."	ARARs presented in Appendix C of the ROD Amendments have been discussed, reviewed, and revised according to conversations conducted with the Air Force, EPA, and Water Board legal departments.