ATSDR Agency for Toxic Substances & Disease Registry

Public Health Assessments & Health Consultations

PUBLIC HEALTH ASSESSMENT

ANDERSEN AIR FORCE BASE
YIGO, GUAM

APPENDIX A:

EVALUATION OF POTENTIAL IRP SITES AT ANDERSON AFB

Site	Site Description/Waste Disposal History	Investigation Results/ Environmental Monitoring Results*	Corrective Activities and/or Current Status	Evaluation of Public Health Hazards
Site No. 1 Landfill No. 1 (LF-1) (Operable Unit (OU): Main Base)	LF-1 opened in 1945 and continues to be used today as the base's only active landfill. Materials disposed of include sanitary trash, waste petroleum, oil, and lubricants (POL), solvents, ferrous metal, construction debris, and pesticides.	**Groundwater:** Trichloroethylene (TCE), tetrachloroethylene (PCE), chloroform, toluene, lead, and other organics were detected. Only lead was detected above Agency for Toxic Substances and Disease Registry (ATSDR) drinking water comparison values (CVs). **Soil**: Total petroleum hydrocarbons (TPH) and metals were detected.	**Corrective Activities**: The Air Force places soil cover on LF-1 daily. **Current Status:** LF-1 is still active and has been transferred to Resource Conservation and Recovery Act (RCRA) program.	**Groundwater**: No public health hazards are associated with LF-1. No drinking water wells are located in this area and none will be installed in the future. **Soil**: LF-1 is located in an industrial area not generally accessed by base personnel. Furthermore, a fence surrounds Andersen AFB and a gated entrance restricts access to the landfill; therefore, past, current, and future exposures to the general public are not expected.

Site No. 2 Landfill No. 2 (LF-2) Landfill No. 4 (LF-4) Landfill No. 5 (LF-5) **(OU: Main Base)**	LF-4 and LF-5 are contained within LF-2. LF-2 was used from 1947 to 1975, with a small area remaining active until 1982. Materials disposed of at this site include sanitary trash, waste POL, solvents, pesticides, ferrous metal, construction debris, and unexploded ordinance (UXO).	**Groundwater:** TCE, PCE, toluene, lead, and other organics were detected. TCE was detected above the ATSDR CV. **Soil**: TPH, volatile organic compounds (VOC), and metals were detected. Dioxins have also been detected at LF-2.	**Corrective Activities**: Small area of LF-2 (all of LF-5) was capped as Remedial Action. **Current Status:** All other site areas in RI/FS process. LF-2 is inactive and currently being remediated in conjunction with the lead stabilization of soils from MARBO and other asphaltic debris. The linear trenches will be covered with stabilized soil.	**Groundwater**: No public health hazards are associated with LF-2. No drinking water wells are located in this area and none will be installed in the future**.** **Soil**: LF-2 is located in an industrial area not generally accessed by base personnel. Furthermore, a fence surrounds Andersen AFB and a gated entrance restricts access to the landfill. Currently, the site is overgrown with vegetation; therefore, past, current, and future exposures to the general public are not expected.
Site No. 3 Waste Pile No. 3 (WP-3) **(OU: Main Base)**	WP-3 was in use from 1947 to 1977. Materials disposed of include waste POL, solvents, industrial wastes, pesticides, sanitary trash, scrap metal, and construction debris.	**Groundwater:** TCE, chloroform, toluene, lead, and other organics were detected.No contaminants were detected above ATSDR CVs. **Soil**: TPH, VOCs, and metals were detected below ATSDR CVs for soil.	**Current Status:** WP-3 is a no further response action planned (NFRAP) site. The results of a risk assessment indicated that the levels of contaminants do not pose a threat to humans under industrial uses. Furthermore, the site has restricted access. Based on these factors, no further actions were recommended.	**Groundwater**: No public health hazards are associated with WP-3. No drinking water wells are located in this area and none will be installed in the future**.** **Soil**: No public health hazard is associated with soil at this site. The site has restricted access (and is considered as an industrial use site) and contaminants were detected at levels below health guidelines.

Site No. 4 Landfill No. 6 (LF-6) **(OU: Main Base)**	From 1953 to 1954, sanitary trash was disposed in LF-6.	**Groundwater:** No accessible groundwater flows beneath the site due to volcanic topography and no contaminants exceed EPA's MCLs in groundwater samples taken from a well located in a 0.5 mile radius of this site. **Soil**: Twenty surface soil samples were analyzed for VOCs, SVOCs, PAHs, and metals. Draft results indicate that aluminum, arsenic, manganese, and vanadium were detected at levels above CVs for a child but below CVs for an adult.	**Current Status:** NFRAP has been recommended for LF-6. A risk assessment indicated that levels of aluminum and manganese might pose concern for young children. The levels are consistent with background concentrations; therefore no further actions were recommended.	**Groundwater**: No public health hazard is associated with this site. No contaminants were detected above background concentrations. **Soil**: Access to LF-6 is restricted; therefore, past, current, and future exposures to the general public are not expected.
Site No. 5 Landfill No. 7 (LF-7) **(OU: Main Base)**	From 1956 to 1958, sanitary trash was disposed in LF-7.	**Groundwater:** No groundwater contamination has been associated with LF-7. **Soil**: Dioxin was detected at concentrations above CVs in surface soil. Elevated levels of lead were measured in subsurface soil.	**Current Status:** In RI/FS process. LF-7 will be cleaned to remove "hot spots" of lead and dioxin.	**Groundwater**: No public health hazard is associated with this site. **Soil**: Site No. 5 is not fenced and lies in the Cape Heart Housing Area built over LF-7, which was covered with clean surface fill material. Two or three houses might overlie the contaminated trenches. No public health hazards are associated with exposure to contaminated surface soil.

				No harmful exposures should occur in the future as lead-contaminated subsurface soil will be removed.
Site No. 6 Landfill No. 8 (LF-8) **(OU: Main Base)**	From 1946 to 1955, asphalt debris was disposed in LF-8.	**Groundwater:** Pesticides were detected in trace amounts. **Soil**: Semi-volatile organic compounds (SVOC) and pesticides were detected.	**Current Status:** LF-8 will be cleaned to remove residual PAHs that remained following the removal of asphalt in 1998.	**Groundwater**: No public health hazard is associated with this site. Contaminants were detected below ATSDR's drinking water CVs. **Soil**: Access to LF-8 is restricted; therefore, past, current, and future exposures to the general public are not expected.
Site No. 7 Landfill No. 9 (LF-9) **(OU: Northwest Field)**	From 1949 to 1955, sanitary trash and concrete construction debris were disposed in LF-9. No areas of fill have been identified nor have areas of storage, release, or disposal of hazardous substances or petroleum products been known to have occurred at this site.	**Groundwater:** PCE, chloroform, toluene, xylene, and lead were detected in trace amounts. **Soil**: No evidence of past landfill activities were found during the initial site reconnaissance. No areas of fill were identified. Only a few areas of minor surface debris (none of it hazardous) were discovered.	**Current Status:** A NFRAP decision was recommended for this site based on the lack of data supporting the presence of a landfill at this location.	**Groundwater**: No public health hazard is associated with this site. Contaminants were detected below ATSDR's drinking water CVs. **Soil**: Quantitative data are limited, but no evidence of soil contamination was found at this site.
Site No. 8 Landfill No.	LF-10 operated from the early to mid-1950s.	**Groundwater:** TCE, PCE, lead, and other	**Current Status:** LF10 (a,b,c) is under	**Groundwater**: No public health hazard is associated

10 (LF-10) Landfill No. 11 (LF-11) Landfill No. 12 (LF-12) **(OU: Main Base)**	Materials disposed of included asphalt wastes, scrap metals, empty 55-gallon drums, sanitary wastes, construction debris, occasional waste POL, and solvents. LF-11 was used in the early 1950s as a disposal area for asphaltic material, empty 55-gallon drums, and construction debris. LF-12 was used in the late 1950s to dispose of sanitary trash and small quantities of asphaltic wastes.	organics were detected. PCE concentrations slightly exceeded the ATSDR drinking water CV. **Soil**: SVOCs (up to 50 ppm) and pesticides were detected.	review. Remediation measures include capping, solidification, and soil removal.	with this site. No production wells exist downgradient from the site and detected contaminants occurred outside the groundwater protection zone (GPZ). **Soil**: Access to this site is restricted; therefore, past, current, and future exposures to the general public are not expected. The site will continue to be used for industrial purposes in the future.
Site No. 9 Landfill No. 13 (LF-13) **(OU: Main Base)**	From 1951 to 1956, sanitary trash, equipment waste, POL, and unknown chemical wastes were discarded in LF-13.	**Groundwater:** No groundwater contamination has been associated with LF-13. **Soil**: ATSDR requested soil data, however data were not available for ATSDR's review.	**Current Status:** In RI/FS process.	**Groundwater**: No public health hazard is associated with this site. No contaminants were detected above background concentrations. **Soil**:No public health hazard is associated with this site. Due to access restrictions no completed exposure pathway to site contaminants exists. The site will continue to be used for industrial purposes in the future.
Site No. 10 Landfill No.	During 1976, concrete debris and construction	**Groundwater:** No groundwater	**Current Status:** LF-14 is still being	**Groundwater**: No public health hazard is associated

14 (LF-14) **(OU: Main Base)**	debris were disposed in LF-14.	contamination has been associated with LF-14. **Soil**: SVOCs were detected below ATSDR CVs for soil. Lead was detected at levels up to 40,000 ppm.	cleaned up but will still require additional characterization and most likely remediation of a subsurface waste pile.	with this site. No contaminants were detected above background concentrations. **Soil**: No public health hazard is associated with this site. Due to access restrictions no completed exposure pathway to site contaminants exists. The site will continue to be used for industrial purposes in the future.
Site No. 11 Landfill 15A Landfill 15B **(OU: Main Base)**	LF-15A was reportedly used in the late 1950s and early 1960s for sanitary trash and construction debris disposal. LF-15B was used in the 1960s for sanitary trash and debris. In the 1970s, solvents were disposed of in LF-15A. Drums of lead-based paint and solvents were discovered in LF-15B in 1981.	**Groundwater:** No groundwater contamination has been associated with LF-15 or LF-16. **Soil**: SVOCs and metals were detected below ATSDR CVs for soil.	**Corrective Activities**: In 1982, drums of paint and solvents were removed. **Current Status:** LF-15 is a NFRAP site. Based on the results of a risk assessment that indicated no threats to human health and the lack of evidence to support the presence of a "landfill" or hazardous waste, no further actions were proposed for this site.	**Groundwater**: No public health hazard is associated with this site. concentrations. **Soil**: No public health hazards are associated with soil at this site because contaminants were detected at levels below CVs.
Site No. 12 Landfill No. 17 (LF-17) Pati Point Dump	From 1945 to 1949, LF-17 was used as a disposal area for sanitary trash and excess equipment (including trucks and	**Groundwater:** No groundwater contamination has been associated with LF-17. **Soil**: ATSDR requested	**Current Status:** In RI/FS process.	**Groundwater**: No public health hazard is associated with this site. concentrations. **Soil**:No public health hazard is associated with this site.

(OU: Main Base)	airplane parts). Pati Point Dump contains trash, office furniture, NiCad batteries, and UXO. It is not known when Pati Point Dump was in use.	soil data, however data were not available for ATSDR's review.		Due to access restrictions no completed exposure pathway to site contaminants exists. The site will continue to be used for industrial purposes in the future.
Site No. 13 Landfill No. 18 (LF-18) **(OU: Main Base)**	From 1967 to 1968, asphaltic waste and waste liquids were discarded in LF-18.	**Groundwater:** Pesticides were detected. **Soil**: Soil sampling is underway; therefore, the results are not yet available.	**Current Status:** In RI/FS process.	**Groundwater**: No public health hazard is associated with this site. No production wells exist downgradient from the site and detected contaminants occurred outside the GPZ. **Soil**: No public health hazard is associated with this site. Due to access restrictions no completed exposure pathway to site contaminants exists. The site will continue to be used for industrial purposes in the future.
Site No. 14 Landfill No. 19 (LF-19) **(OU: Main Base)**	In 1955, approximately 50 to 70 drums of asphalt were disposed in LF-19.	**Groundwater:** No groundwater contamination has been associated with LF-19. **Soil**: Soil sampling is underway; therefore, the results are not yet available.	**Current Status:** In RI/FS process.	**Groundwater**: No public health hazard is associated with this site. **Soil**: No public health hazard is associated with this site. Due to access restrictions no completed exposure pathway to site contaminants exists. The site will continue to be used for industrial purposes in the

				future.
Site No. 15 Landfill No. 20 (LF-20) **(OU: Main Base)**	LF-20 contains sanitary trash from 1968.	**Groundwater:** No groundwater contamination has been associated with LF-20. **Soil**: ATSDR requested soil data, however data were not available for ATSDR's review.	**Current Status:** In RI/FS process.	**Groundwater**: No public health hazard is associated with this site. No contaminants were detected above background concentrations. **Soil**: No public health hazard is associated with this site. Due to access restrictions no completed exposure pathway to site contaminants exists. The site will continue to be used for industrial purposes in the future.
Site No. 16 Landfill No. 21 (LF-21) **(OU: Northwest Field)**	From the mid-1950s to 1963, LF-21 operated as a sanitary trash disposal site.	**Groundwater:** No groundwater contamination has been associated with LF-21. **Soil**: VOCs and SVOCs were detected below ATSDR CVs for soil. Soil metals included cadmium (up to 240 ppm), chromium (up to 6,500 ppm), and lead (up to 16,000 ppm).	**Current Status:** Cleanup is in progress at LF-21. Further remediation includes the removal of additional hotspots of PAH- and metal- contaminated soil, testing of excavated area, and disposal either at the base landfill or an off island location.	**Groundwater**: No public health hazard is associated with this site. **Soil**: No public health hazard is associated with this site. Due to access restrictions no completed exposure pathway to site contaminants exists. The site will continue to be used for industrial purposes in the future.
Site No. 17 Landfill No. 22 (LF-22) **(OU: Northwest**	During the 1950s, sanitary trash and unknown quantities of UXO and black powder were discarded in LF-22.	**Groundwater:** No groundwater contamination has been associated with LF-22. **Soil**: Sixteen surface	**Current Status:** LF-22 is a NFRAP site. Based on the results of a risk assessment that indicated none of the soil	**Groundwater**: No public health hazard is associated with this site. **Soil**: No public health hazard is associated with this

Field)		soil samples were analyzed for SVOCs, PAHs, metals, and cyanide. Draft results indicate that aluminum, cadmium, and manganese exceeded CVs for a child, but were below CVs for adults.	contaminant level posed unacceptable risks to human health, no further actions were proposed for this site.	site. Due to access restrictions no completed exposure pathway to site contaminants exists. The site will continue to be used for industrial purposes in the future.
Site No. 18 Landfill No. 23 (LF-23) **(OU: Harmon)**	LF-23 holds sanitary trash from operations in the late 1950s. No storage, release, or disposal of hazardous substances or petroleum products is known to have occurred at this site.	**Groundwater:** No groundwater contamination has been associated with LF-23. **Soil**: SVOCs and metals were detected below ATSDR CVs for soil.	**Current Status:** LF-23 is a NFRAP site. Based on the lack of evidence to support the presence of a "landfill" or hazardous waste, no further actions were recommended for this site.	**Groundwater**: No public health hazard is associated with this site. **Soil**: No public health hazards are associated with soil at this site. The site is generally inaccessible to the public and only low levels of contaminants were detected in soil.
Site No. 19 Landfill No. 24 (LF-24) **(OU: Harmon)**	LF-24 holds sanitary trash and possibly other types of debris from the 1950s.	**Groundwater:** No groundwater contamination has been associated with LF-24. **Soil**: SVOCs (up to 230 ppm), metals, and trace amounts of dioxins were detected. Only SVOC concentrations exceeded ATSDR CVs for soil.	**Current Status:** Cleanup is complete at LF-24.	**Groundwater**: No public health hazard is associated with this site. **Soil**: Access to this site was restricted; therefore, past exposures to the general public were not expected.
Site No. 20 Waste Pile No. 7 (WP-7) (formerly	WP-7 was in use from 1945 to 1962. It contains sanitary trash, waste POL, solvents, scrap	**Groundwater:** TCE, PCE, 1,1,1-trichloroethane (TCA), carbon tetrachloride	**Current Status**: As recommended in the ROD, the area was covered with clean fill to	**Groundwater**: No public health hazard is associated with WP-7 because no on-site production wells

known as Landfill No. 25) **(OU: MARBO Annex)**	vehicles, and equipment, construction debris, and waste dry cleaning fluids.	(CCl_4), toluene, xylene, lead, pesticides, and other organics were detected. TCE was detected slightly above the ATSDR drinking water CV. **Soil**: TPH and metals were detected in surface soil at levels below ATSDR CVs.	reduce the risk of exposure to contaminated soil.	exist. WP-7 appears to be the source of TCE-contaminated groundwater in YU-2. **Soil**: No public health hazard is associated with soil at this site. The area is generally inaccessible to the public, only low levels of contaminants were detected, and the area has been covered with soil and vegetation.
Site No. 21 Landfill No. 26 (LF-26) **(OU: Northwest Field)**	LF-26 is filled with sanitary trash and construction debris from 1966.	**Groundwater:** Groundwater monitored at wells located 0.5 miles away indicate that no site contaminants exceeded CVs or MCLs. **Soil**: SVOCs (up to 42 ppm), metals, and dioxins were detected.	**Current Status:** LF-26 is a NFRAP site. Based on the results of a human health risk assessment indicating that exposure to surface soil would not increase the likelihood of cancer for residents, no further response actions were recommended.	**Groundwater**: No public health hazard is associated with this site because no on-site production wells exist. **Soil**: Access to LF-26 is restricted; therefore, past, current, and future exposures to the general public are not expected. No completed exposure pathway to site contaminants exists and no public health hazard is associated with this site.
Site No. 22 Waste Pile No. 6 (WP-6) (formerly known as Landfill No. 27)	WP-6 contains construction debris. Dates of operation are unknown.	**Groundwater:** PCE, toluene, lead, pesticides, and other organics were detected. Only PCE was detected above its respective ATSDR drinking water CV. **Soil**: TPH, VOCs, and	**Current Status:** Cleanup at WP-6 is in progress. The ROD selected soil removal as the preferred remedial alternative. Soil removal includes removal of asphalt drums, roofing	**Groundwater**: No public health hazard is associated with this site because no on-site production wells exist. WP-6 contributes to the PCE-contamination detected in YU-1 groundwater.

(OU: MARBO Annex)		metals (lead levels up to 6,500 ppm) were detected at levels above CVs. .	material, and metal debris.	**Soil**: Access to this site is restricted; therefore, past, current, and future exposures to the general public are not expected. Furthermore, no exposure to contaminated soil should occur in the future following the proposed soil removal measures, as recommended in the ROD.
Site No. 23 Waste Pile No. 5 (WP-5) (formerly known as Landfill No. 28) **(OU: MARBO Annex)**	WP-5 holds construction debris and auto bodies from unknown dates of operation.	**Groundwater:** PCE, toluene, lead, pesticides, and other organics were detected at levels below ATSDR's drinking water CVs. **Soil**: TPH and metals were detected below ATSDR CVs for soil.	**Current Status:** No health risks were found at WP-5; therefore no further action was recommended in the 1998 ROD for the MARBO Annex.	**Groundwater**: No public health hazard is associated with WP-5. All detected contaminants are below ATSDR's drinking water CVs. **Soil**: No public health hazard is associated with soil at WP-5. The site is inaccessible to the public and contaminants were detected in soil at levels below CVs.
Site No. 24 Landfill No. 29 (LF-29) **(OU: MARBO Annex)**	LF-29 is littered with household debris and garbage. Dates of operation are unknown.	**Groundwater:** Lead, pesticides, and other organics were detected in trace amounts. **Soil**: Trace amounts of VOCs were detected. Metal concentrations at LF-29 included antimony, chromium at 860 ppm and lead at 1,100 ppm at levels above CVs.	**Current Status:** LF-29 was covered with a uniform 2-foot layer of recemented limestone and several inches of soil and the surface of the landfill was vegetated. An estimated 13,000 cubic yards of lead- and antimony- contaminated soil is being excavated, treated to reduce	**Groundwater**: No public health hazard is associated with LF-29. All detected contaminants are below ATSDR's drinking water CVs. **Soil**: Access to LF-29 is restricted; therefore, past, current, and future exposures to the general public are not expected. No completed exposure pathway to site contaminants exists, and no

			leachability of the metals, and then transported to Andersen AFB Landfill for disposal..	public health hazard is associated with this site.
Site No. 25 Fire Training Area No. 1 (FTA-1) **(OU: Main Base)**	From 1945 to 1958, waste solvents and contaminated fuels were used at FTA-1.	**Groundwater:** No groundwater contamination has been associated with FTA-1. **Soil**: Seven surface soil samples were analyzed for SVOCs, PAHs, pesticides, PCBs, and metals. Aluminum exceeded the CV for a child, but all other concentrations were below ATSDR's CVs for a child and adult.	**Current Status:** A NFRAP is recommend by the Air Force for this site based on the results of historical records search, document review, field investigations, and a risk assessment.	**Groundwater**: No public health hazard is associated with this site. **Soil**: No public health hazards are associated with soil at this site. The site is generally inaccessible to the public and only low levels of contaminants were detected in soil.
Site No. 26 Fire Training Area No. 2 (FTA-2) **(OU: Main Base)**	Between 1958 and 1988, contaminated JP-4, Mogas, diesel, waste POL, and solvents were spilled at FTA-2.	**Groundwater:** TCE and PCE were detected. BTEX (benzene, toluene, ethylbenzene, and xylene) were present at concentrations up to 7,200 ppb at levels above CVs. **Soil**: Dioxins (up to 19,000 ppm), VOCs (up to 109 ppm), SVOCs (up to 6.8 ppm), TPH, pesticides, and metals were detected at levels above CVs. .	**Corrective Activities**: The Air Force has not used FTA-2 since December 1988 due to closure by GEPA. **Current Status:** Bioventing will be used to remediate a subsurface plume of VOCs and BTEX compounds.	**Groundwater**: No public health hazard is associated with FTA-2 because no on-site production wells exist. FTA-2 is no longer in use, so toluene levels can be expected to decrease in the future. **Soil**: Access to FTA-2 is highly restricted; therefore, past, current, and future exposures to the general public are not expected.

Site No. 27 Hazardous Waste Storage Area No. 1 (HW-1) **(OU: Main Base)**	Beginning in 1950 and continuing through the 1970s, POL and solvents were stored at HW-1. From the late 1970s to 1983, HW-1 was used to store hazardous wastes.	**Groundwater:** Groundwater data from downgradient wells have reported only trace amounts of VOCs (TCE). **Soil**: Trace amounts of VOCs and SVOCs were detected. Metals concentrations in surface soil were below background concentrations. Metal concentrations at HW-1 in the shallow subsurface soil included arsenic (up to 201 ppm), chromium (up to 1,300 ppm), and lead (up to 8,600 ppm) at levels above CVs.	**Current Status:** HW-1 is a NFRAP site. Site investigations indicate that no contaminants above residential soil standards exist in surface soil, ; therefore, no further response actions were recommended.	**Groundwater**: No public health hazard is associated with this site. **Soil**: Access to HW-1 is restricted and contamination was limited to the inaccessible subsurface soil; therefore, past, current, and future exposures to the general public are not expected.
Site No. 28 Chemical Storage Area No. 1 (CS-1) **(OU: Main Base)**	In the early 1970s, the site may have been used for the disposal of waste petroleum, oils, lubricants, and chlorinated solvents. About 70% of the site is filled material covered with vegetative cover.	**Groundwater:** No groundwater contamination has been associated with CS-1. **Soil**: SVOCs and PAHs were detected in low concentrations. Metals, including arsenic (up to 15 ppm) and lead (up to 770 ppm), exceeded CVs.	**Current Status:** CS-1is a NFRAP site.Based on the results of a human health risk assessment indicating that exposure to surface soil would not increase the likelihood of non-cancer effects or cancer for residents, no further response actions were recommended.	**Groundwater**: No public health hazard is associated with this site. **Soil**: No public health hazard is associated with soil at CS-1. Although metals were detected in soil at levels above health-based guidelines, no exposure is occurring or is likely to occur. The site is generally inaccessible to the public due to heavy vegetative growth, which prevent contact with soil contamination.

Site No. 29 Waste Pile No. 2 (WP-2) (formerly known as Chemical Storage Area 2) **(OU: Main Base)**	Deteriorating drums of asphaltic tar are located at WP-2. Dates of operation are unknown.	**Groundwater:** TCE, PCE, toluene, lead, and other organics were detected in trace amounts. **Soil**: SVOCs were detected at levels up to 0.26 ppm. With the exception of chromium (up to 950 ppm) metal concentrations were below CVs.	**Current Status:** Cleanup is complete at WP-2.	**Groundwater**: No public health hazard is associated with this site. Contaminants were detected below ATSDR's drinking water CVs. **Soil**: Access to this site was restricted; therefore, past exposures to the general public were not expected. No current or future exposures are likely because contaminated media has been cleaned up at WP-2.
Site No. 30 Waste Pile No. 4 (WP-4) (formerly known as Chemical Storage Area 3) **(OU: Northwest Field)**	From 1950 to 1970, UXO was disposed in WP-4. In addition, the site was reportedly used for the disposal of waste oils and solvents.	**Groundwater:** Groundwater collected from downgradient monitoring wells contained VOCs and metals. Chromium and nickel possibly related to corrosion of the steel pump and screens in wells exceeded EPA's MCLs. **Soil**: PAHs were detected at levels up to CVs. Chromium concentrations in soil reached 2,200 ppm, levels above CVs.	**Current Status:** WP-4 is a NFRAP sites. A risk assessment indicated that exposure to surface soil posed non-cancer and cancer risk for trespassers and potential future residents. However, soil contaminant concentrations were consistent with regional background concentrations; therefore, no further response actions were recommended.	**Groundwater**: No public health hazard is associated with this site. Contaminants were detected below ATSDR's drinking water CVs. **Soil**: Access is restricted to assigned military personnel or authorized visitors and currently no people work or live on or near the site. Furthermore, the soil at the site is covered with mixed vegetation. Therefore, past, current, and future exposures to the general public are not expected.
Site No. 31 Chemical Storage Area No. 4 (CS-4)	From 1952 to 1956, waste oils and solvents were stored at CS-4.	**Groundwater:** No groundwater contamination has been associated with CS-4.	**Current Status:** Cleanup is in progress at CS-4. Approximately 420 cubic yards of	**Groundwater**: No public health hazard is associated with this site. **Soil**: Access to this site is

(OU: Northwest Field)		**Soil**: Dioxins (up to 130 ppm), VOCs (up to 1 ppm), TPH, and lead (up to 3,100 ppm) were detected at levels above CVs.	lead-contaminated soils will be excavated and disposed of.	restricted; therefore, past, current, and future exposures to the general public are not expected.
Site No. 32 Drum Storage Area No. 1 (DS-1) **(OU: Main Base)**	DS-1 is an vehicle wash area, landfill, and drum storage area for POL products and solvents. The area consists of a 1-acre square asphalt foundation equipped with a vehicle wash rack and drainage system, leach field, and dump pit bounded by chain link fencing.	**Groundwater:** No groundwater contamination has been associated with DS-1. **Soil**: SVOCs and pesticides were detected.	**Current Status:** DS-1 is still active and was transferred to the Environmental Compliance Program Upon transfer, the IRP made recommendations for further soil sampling.	**Groundwater**: No public health hazard is associated with this site. **Soil**: Access to DS-1 is highly restricted; therefore, past, current, and future exposures to the general public are not expected.
Site No. 33 Drum Storage Area No. 2 (DS-2) **(OU: Main Base)**	DS-2 is an active drum storage area for asphalt, paint, oil, tar, and contaminated soil from underground storage tank (UST) removals. It is about 4,000 feet from the nearest housing and is fenced. No evidence exists that the area was used for storage of hazardous substances before 1984.	**Groundwater:** TCE, PCE, lead, and other organics were detected. PCE concentrations slightly exceeded the ATSDR drinking water CV. **Soil**: Pesticides were detected.	**Current Status:** DS-2 is still active and was transferred to the Environmental Compliance Program because of the lack of evidence suggesting that hazardous material was present at the site prior to 1984. Upon transfer, the IRP made recommendations for further assessment of the site.	**Groundwater**: No public health hazard is associated with this site because no production wells are located in this area and no one is exposed to contaminated groundwater. **Soil**: Access to DS-2 is highly restricted; therefore, past, current, and future exposures to the general public are not expected.

Site No. 34 PCB Storage Area **(OU: Main Base)**	The PCB Storage Area is no longer in use, but its dates of operation are unknown. This area was used for storage purposes and for the removal of oil from electrical equipment.	**Groundwater:** No groundwater contamination has been associated with the PCB Storage Area. **Soil**: SVOCs (up to 2 ppm) and PCB (up to 19 ppm) were detected at levels above CVs.	**Current Status:** Cleanup is in progress at the PCB Storage Area.	**Groundwater**: No public health hazard is associated with this site. No contaminants were detected above background concentrations. **Soil**: Access to the site is highly restricted; therefore, past, current, and future exposures to the general public are not expected. No completed exposure pathway exists.
Site No. 35 Waste Pile No. 1 (WP-1) **(OU: Main Base)**	Several thousand deteriorated drums of asphaltic tar from unknown dates are located at WP-1.	**Groundwater:** TCE, PCE, toluene, lead, pesticides, and other organics were all detected below ATSDR drinking water CVs. **Soil**: Dioxins (up to 87 ppm), SVOCs (up to 0.27 ppm), TPH, and metals (chromium levels up to 1,550 ppm) were detected at levels above CVs.	**Current Status**: Asphalt removal and excavation began in 1997. Drums containing asphalt material were emptied into trenches. Asphalt in about 3,000 drums has been processed and recovered at an on-site asphalt recovery system. About 3,000 cubic yards of asphalt debris and about 8,000 drums remain stockpiled at the site. A pilot study was planned to evaluate the disposal of the remaining debris.	**Groundwater**: No public health hazard is associated with this site. Contaminants were detected below ATSDR's drinking water CVs. **Soil**: No public health hazard is associated with soil at this site. Confirmatory soil sampling conducted after asphalt debris removal activities found no elevated levels of organic compounds. **Physical Hazards:** Due to site access restrictions, no hazards exists to the general public. Only trained personnel conducting work in accordance with OSHA requirements for health and safety are allowed access.

Site No. 36 Ritidian Waste Pile **(OU: Northwest Field)**	The dates of operation and contents of the Ritidian Waste Pile are unknown.	**Groundwater:** No groundwater contamination has been associated with the Ritidian Waste Pile. **Soil**: Soil sampling is underway; therefore, the results are not yet available.	**Current Status:** An EE/CA is underway.	**Groundwater**: No public health hazard is associated with this site. **Soil**: Access to LF-36 is restricted; therefore, past, current, and future exposures to the general public are not expected. However, ATSDR will review soil data when available to further assess potential public health hazards.
Site No. 37 War Dog Borrow Pit (WDBP) **(OU: MARBO Annex)**	WDBP is an abandoned quarry. Its dates of operation and contents are unknown.	**Groundwater:** TCE was detected above the ATSDR drinking water CV. PCE, TCA, chloroform, toluene, xylene, lead, and other organics were detected in trace amounts. **Soil**: TPH (dioxin levels up to 94 ppm) and metals were detected were detected at levels above CVs. .	**Current Status:** NFRAP.	**Groundwater**: No apparent public health hazard is associated with this site. TCE concentrations are diluted by the military's water distribution system. No public or private production wells are or have been contaminated by TCE from WDBP, and all other detected contaminants are below ATSDR's drinking water CVs. **Soil**: Access to WDBP is highly restricted; therefore, past, current, and future exposures to the general public are not expected.
Site No. 38 MARBO Laundry Facility (MLF)	The MARBO Laundry Facility is a former laundry facility.	**Groundwater:** PCE was detected above the ATSDR drinking water CV. TCE, CCl_4, chloroform, toluene,	**Current Status:** Cleanup is complete at MLF.	**Groundwater**: No public health hazards are associated with PCE-contaminated groundwater underlying the MARBO Laundry Facility

(OU: MARBO Annex)		xylene, lead, pesticides, and other organics were detected in trace amounts. **Soil**: TPH (dioxin levels up to 120 ppm) and metals (lead levels up to 15,700 ppm) were detected at levels above CVs.		because no production wells are located in this area and no one is exposed to contaminated groundwater. The MARBO Laundry Facility appears to be the main source of the YU-1 plume that may potentially contaminate downgradient production wells with PCE. Other chemicals concentrations at this site remain below ATSDR's drinking water CVs and are not associated with any public health hazards. **Soil**: Access to this site was restricted; therefore, past exposures to the general public were not expected. No current or future exposures are likely because contaminated soil has been cleaned up at MLF.
Site No. 39 Harmon Substation **(OU: Harmon)**	The dates of operation and waste contents at the Harmon Substation site are unknown.	**Groundwater:** No groundwater contamination has been associated with the Harmon Substation. **Soil**: Dioxins (up to 0.78 ppm), VOCs (up to 9.8 ppm), SVOCs (up to 1.8 ppm), pesticides (up to 12 ppm), and metals (chromium levels up to	**Current Status:** Cleanup is complete at HSS.	**Groundwater**: No public health hazard is associated with this site. **Soil**:Access to this site was restricted; therefore, past exposures to the general public were not expected. No current or future exposures are likely because contaminated media has been cleaned up at HSS.

		830 ppm) were detected,some at levels above at CVs.		

Sources: SAIC 1991; USAF 1992a, 1996, 1997, 2000. Andersen AFB 1998b, 1998c, 1998d; Andersen AFB 1999c, 1999d, 1999e, 1999f, 1999g; Andersen AFB 2000b, 2000c.
*Groundwater results are for monitoring and production wells located immediately downgradient of each site.

APPENDIX B: GLOSSARY

Background Level:
A typical or average level of a chemical in the environment. *Background* often refers to naturally occurring or uncontaminated levels.

Biota:
Plants or animals. Refers to those organisms collected and hunted for food.

Carcinogen:
Any substance that may produce cancer.

Comparison Values:
Estimated contaminant concentrations in specific media that are not likely to cause adverse health effects, given a standard daily ingestion rate and standard body weight. The *comparison values* are calculated from the scientific literature available on a contaminant's exposure and health effects.

Concentration:

The amount of one substance dissolved or contained in a given amount of another. Forexample, sea water contains a higher concentration of salt than fresh water.

Contaminant:

Any substance or material that enters a system where it is not normally found or found in greater concentrations than background levels.

Dose:

The amount of substance to which a person is exposed. *Dose* often takes body weight into account.

Environmental contamination:

The presence of hazardous substances in the environment. From the public health perspective, *environmental contamination* is addressed when it potentially affects the health and quality of life of people living and working near the contamination.

EPA's Reference Dose (RfD):

An estimate of the daily exposure to a contaminant unlikely to cause non-carcinogenic adverse health effects over a lifetime of exposure. Like ATSDR's MRL, EPA's RfD is a dose expressed in mg/kg/day.

Exposure:

Contact with a chemical by swallowing, by breathing, or by direct contact (such as through the skin

or eyes). *Exposure* may be short term (acute) or long term (chronic).

Hazard:
A source of risk that does not necessarily imply potential for occurrence. A hazard produces risk only if an exposure pathway exists, and if exposures create the possibility of adverse consequences.

Indeterminate Public Health Hazard:
The designation given to sites for which no conclusions about public health hazards can be made because data are lacking.

Ingestion:
Swallowing (such as eating or drinking). Chemicals can get in or on food, drink, utensils, cigarettes, or hands where they can be ingested. After *ingestion*, chemicals can be absorbed into the blood and distributed throughout the body.

Maximum Contaminant Levels (MCLs):
MCLs are legal drinking water quality standards defined by the Safe Drinking Water Act. MCLs represent contaminant concentrations in drinking water that someone could be exposed to on a daily basis over a life time without adverse health effects.

Media:
Soil, water, air, plants, animals, or any other parts of the environment that can contain contaminants.

Minimal Risk Level (MRL):

An *MRL* is defined as an estimate of daily human exposure to a substance that is likely to be without an appreciable risk of adverse effects (noncancer) over a specified duration of exposure. *MRLs* are derived when reliable and sufficient data exist to identify the target organ(s) of effect or the most sensitive health effect(s) for a specific duration via a given route of exposure. *MRLs* are based on noncancer health effects only. *MRLs* can be derived for acute, intermediate and chronic duration exposures by the inhalation and oral routes.

National Priorities List (NPL):

EPA's listing of sites that have undergone preliminary assessment and site inspection to determine which locations pose an immediate threat to persons living or working near the release. These sites are most in need of cleanup.

No Apparent Public Health Hazard:

The designation given to sites where human exposure to contaminated media is occurring or has occurred in the past, but the exposure is below a level of health hazard.

Plume:

An area of chemicals in a particular medium, such as air or groundwater, moving away from its source in a long band or column. A *plume* can be a column of smoke from a chimney or chemicals moving with groundwater.

Potentially Exposed:

The condition where valid information, usually analytical environmental data, indicates the

presence of contaminant(s) of a public health concern in one or more environmental media contacting humans (e.g., air, drinking water, soil, food chain, surface water), and there is evidence that some of those persons may have an identified route(s) of exposure (e.g., drinking contaminated water, breathing contaminated air, having contact with contaminated soil, or eating contaminated food).

Public Health Assessment:

The evaluation of data and information on the release of hazardous substances into the environment in order to assess any current or future impact on public health, develop health advisories or other recommendations, and identify studies or actions needed to evaluate and mitigate or prevent human health effects; also, the document resulting from that evaluation.

Public Health Hazard:

Sites that pose a public health hazard as the result of long-term exposures to hazardous substances.

Reference Concentration (RfC):

A concentration in air expected to be associated with no deleterious health effects over a lifetime of exposure, assuming default body weights and inhalation rates.

Risk:

The probability that something will cause injury, combined with the potential severity of that injury.

Route of Exposure:

The path in which a person may contact a chemical substance. For example, drinking(ingestion) and

bathing (skin contact) are two different *routes of exposure* to contaminants that may be found in water.

Volatile organic compound (VOC):

Substance containing carbon and different proportions of other elements such as hydrogen, oxygen, fluorine, chlorine, bromine, sulfur, or nitrogen; these substances easily become vapors or gases. A significant number of the VOCs are commonly used as solvents (e.g., paint thinners, lacquer thinner, degreasers, dry cleaning fluids).

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