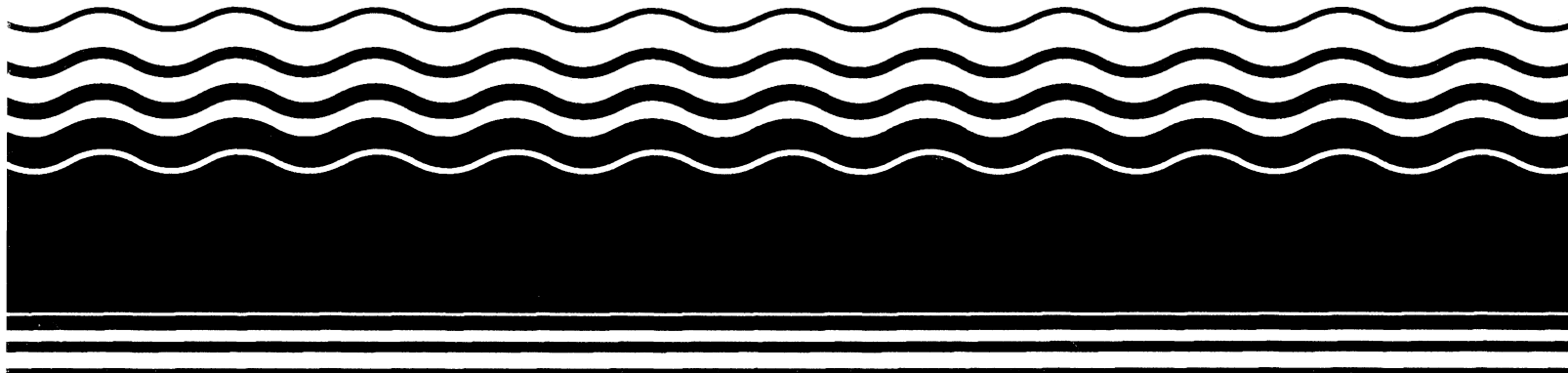


**PB96-964416
EPA/ROD/R08-96/125
January 1997**

EPA Superfund Record of Decision:

**F.E. Warren Air Force Base,
Operable Unit 3; Landfill 6, Cheyenne, WY
1/22/1996**



DECLARATION FOR THE RECORD OF DECISION

INTERIM ACTION

OPERABLE UNIT 3; LANDFILL 6

1.0 SITE NAME AND LOCATION

F. E. Warren Air Force Base
Cheyenne, Wyoming

2.0 STATEMENT OF BASIS AND PURPOSE

The selected interim action (remedy) for Operable Unit 3 (OU3), Landfill 6 (LF6), at F.E. Warren Air Force Base (Base), in Cheyenne, Wyoming includes CAPPING and an active gas venting system. The selected action, the third at the Base, was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The selected remedy addresses only source control at LF6, a portion of OU3. This decision is based on the Administrative Record for the site. The United States Environmental Protection Agency (EPA) and State of Wyoming Department of Environmental Quality (WDEQ), as oversight agencies, concur with the selected remedy. The United States Air Force is the lead agency for the site.

3.0 ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the remedy selected in this Record of Decision (ROD), may present a current or potential threat to public health, welfare, or the environment.

4.0 DESCRIPTION OF THE SELECTED REMEDY

The selected remedy for LF6 is a source control action that includes capping and an active gas venting system. OU3 is the third of ten operable units to be investigated under terms of the Federal Facility Agreement (FFA). The others are: OU1 - Spill Sites 1 through 7; OU2 - Facility Ground Water (except at OUs 3, 6, 7 and 8); OU4 - Acid Dry Wells; OU 5 - Fire Protection Training Area 2; OU 6 - Open Burning/Open Detonation Area; OU7 - Firing Ranges; OU 8- Landfill 5; OU9- Landfills 2 and 4; and OU10- Landfill 7 and Fire Protection Training Area 1. The ground water contamination associated with OUs 3, 6, 7, and 8 will be investigated and remediated as part of those OUs, separate from OU2. All of the investigations are being conducted in accordance with the FFA. It is anticipated that the ROD for OU2 will be issued after the remedial investigation (RI) has been completed for the other OUs.

The function of the interim action is to control the LF6 site as a source of ground-water contamination by reducing infiltration and the downward movement of contaminants to the ground water, and to reduce the risks associated with exposure to contaminated materials. While the remedy addresses one of the principal threats at the site, the final remedial alternative will address remediation of the downgradient contaminant plume.

The major components of the selected remedy include:

- Capping Landfill 6 in accordance with relevant and appropriate Resource Conservation and Recovery Act Subtitle C landfill closure requirements;
- Installing an active venting system to control methane production;
- Installing erosion and surface water controls;
- Conducting environmental monitoring to ensure the effectiveness of the interim action; and
- Preparing final LF6 remedial investigation and feasibility studies to identify the extent of ground-water contamination downgradient of the landfill and to develop and evaluate appropriate remedial alternatives for ground water treatment.

5.0 STATUTORY DETERMINATIONS

The United States Air Force (USAF) has determined, with the concurrence of the Environmental Protection Agency, and the State of Wyoming, that this interim action is protective of human health and the environment, complies with Federal and State applicable or relevant and appropriate requirements directly associated with this action, satisfies the requirements for a waiver of any standards that won't be met, and is cost-effective. This action utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site. However, because treatment of the principal threats of the site was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. The size of the landfill and the fact that there are no apparent on-site hot spots that represent the major sources of contamination preclude a remedy in which contaminants could be excavated and treated effectively. Because this action does not constitute the final remedy for LF6, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be addressed at the time of the final response action. Subsequent actions are planned to address fully the principal threats posed by LF6.

CERCLA Section 121(c), 42 U.S.C. Section 9621(c), requires five-year reviews in the event that hazardous substances, pollutants or contaminants remain on site. The USAF will conduct reviews every five years after issuance of this ROD.

6.0 SIGNATURE OF AGENCY ACCEPTANCE OF REMEDY (EPA)

The undersigned representative concurs with this Record of Decision for Interim Action, Operable Unit 3: Landfill 6, at F. E. Warren AFB, Wyoming.

Wm Yellowtail
WILLIAM P. YELLOWTAIL
ADMINISTRATOR
EPA REGION VIII

22 JAN. 1996
Date

6.0 SIGNATURE OF AGENCY ACCEPTANCE OF REMEDY (USAF)

The undersigned representative concurs with this Record of Decision for Interim Action, Operable Unit 3: Landfill 6, at F. E. Warren AFB, Wyoming.



PATRICK P. CARUANA, LIEUTENANT GENERAL

VICE COMMANDER

AIR FORCE SPACE COMMAND



Date

6.0 SIGNATURE OF AGENCY ACCEPTANCE OF REMEDY (WDEQ)

The undersigned representative concurs with this Record of Decision for Interim Action, Operable Unit 3: Landfill 6, at F. E. Warren AFB, Wyoming.



DENNIS HEMMER

DIRECTOR
WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

2-14-96
Date

DECISION SUMMARY FOR THE RECORD OF DECISION

INTERIM ACTION

OPERABLE UNIT 3:LANDFILL 6

1.0 SITE NAME, LOCATION, AND DESCRIPTION

F. E. Warren Air Force Base (Base), occupies approximately 5,866 acres immediately adjacent to the west side of the City of Cheyenne, Wyoming (Figure 1).

The Base was placed on the National Priorities List on February 21, 1990. Historically, the Base has served a number of military functions, including; cavalry outpost, quartermaster depot and intercontinental ballistic missile operations base. Operations began at the U. S. Army outpost named Fort D. A. Russell in 1867. The name was changed to Fort F. E. Warren in 1930. The Base was a major training facility during and after World War II. Fort F. E. Warren was transferred to the newly formed U. S. Air Force in 1947 and was subsequently named F. E. Warren Air Force Base. The Base underwent extensive renovation after World War II. The majority of the Army training facilities were torn down and not replaced. Construction since that time has centered on facilities for Air Force operations. Beginning in 1958, F. E. Warren Air Force Base became a Strategic Air Command (SAC) base. Since then, F. E. Warren Air Force Base has served as an operations center for, first, the Atlas Intercontinental Ballistic Missile (ICBM), followed by the Minuteman I and III and finally, the Peacekeeper (MX) ICBMs. The Base was part of Air Combat Command (ACC) from 1992 to 1993, and in July 1993, became part of Space Command.

F. E. Warren Air Force Base is bordered by agricultural land and rural or suburban residential areas. The Base contains 831 residential housing units and several unaccompanied personnel housing units (barracks), along with the services required by residents. The nearest residences to Landfill 6 (LF6), are off- Base, approximately 600 feet to the west.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

LF6 is an area of about 44 acres located north of Diamond Creek, west of Missile Drive, and along the western boundary of the Base as shown in figure 2. The estimated volume of fill at the landfill is 201,600,000 cubic feet. This volume could be considerably less if the disposal trenches were 15- to 20-feet deep as described in a report subsequent to the original records search which reported a 60-foot depth. The landfill has a soil and sparse-grass cover. Depth to the water table in the area of LF6 ranges from about 5 to 41 feet below ground surface. The 1985 records search stated that LF6 was managed from 1971 until 1984; however a later 1993 report suggests that operations may have started earlier. This site was operated as a trench-and-fill operation, with all refuse from the Base shops

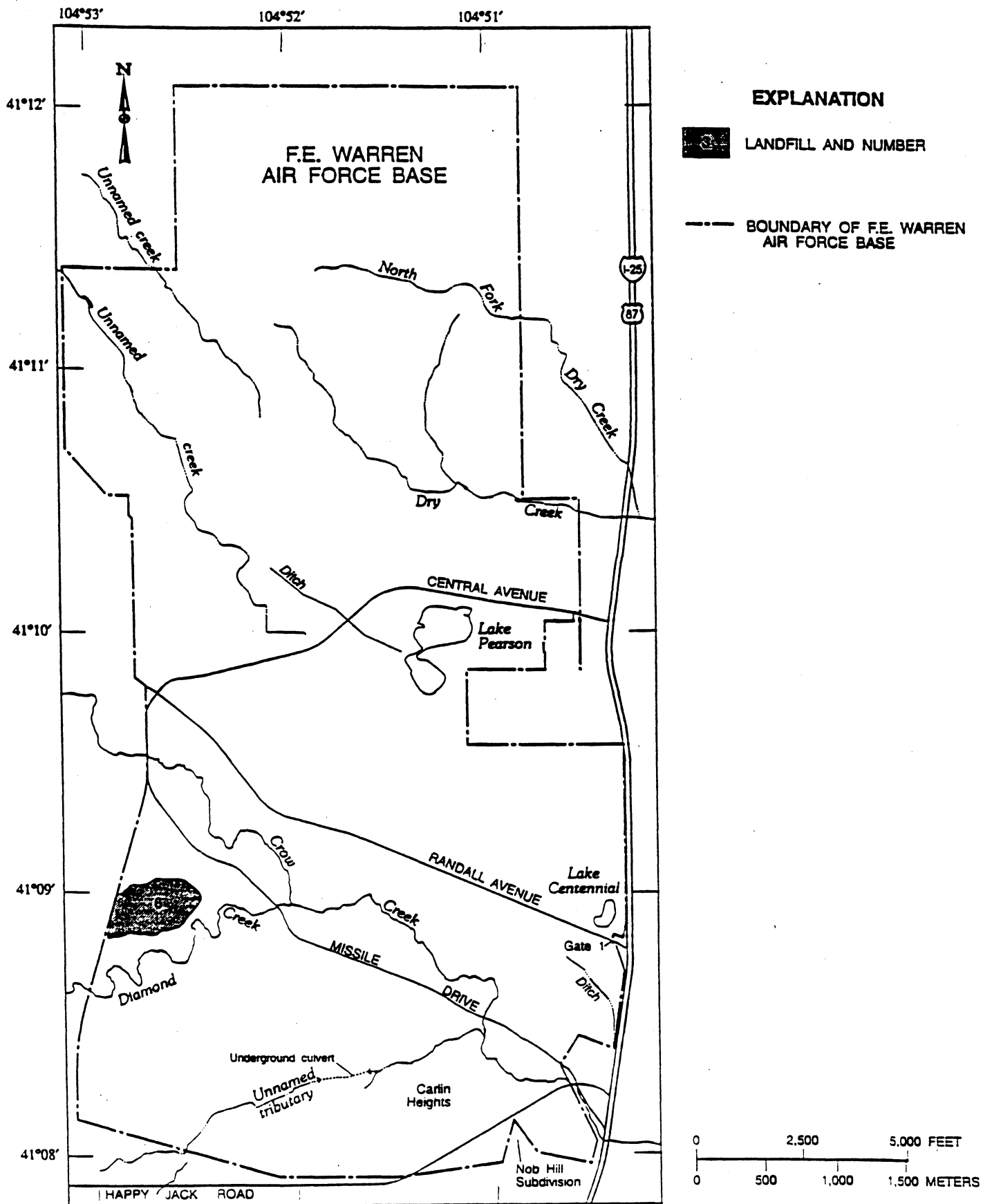
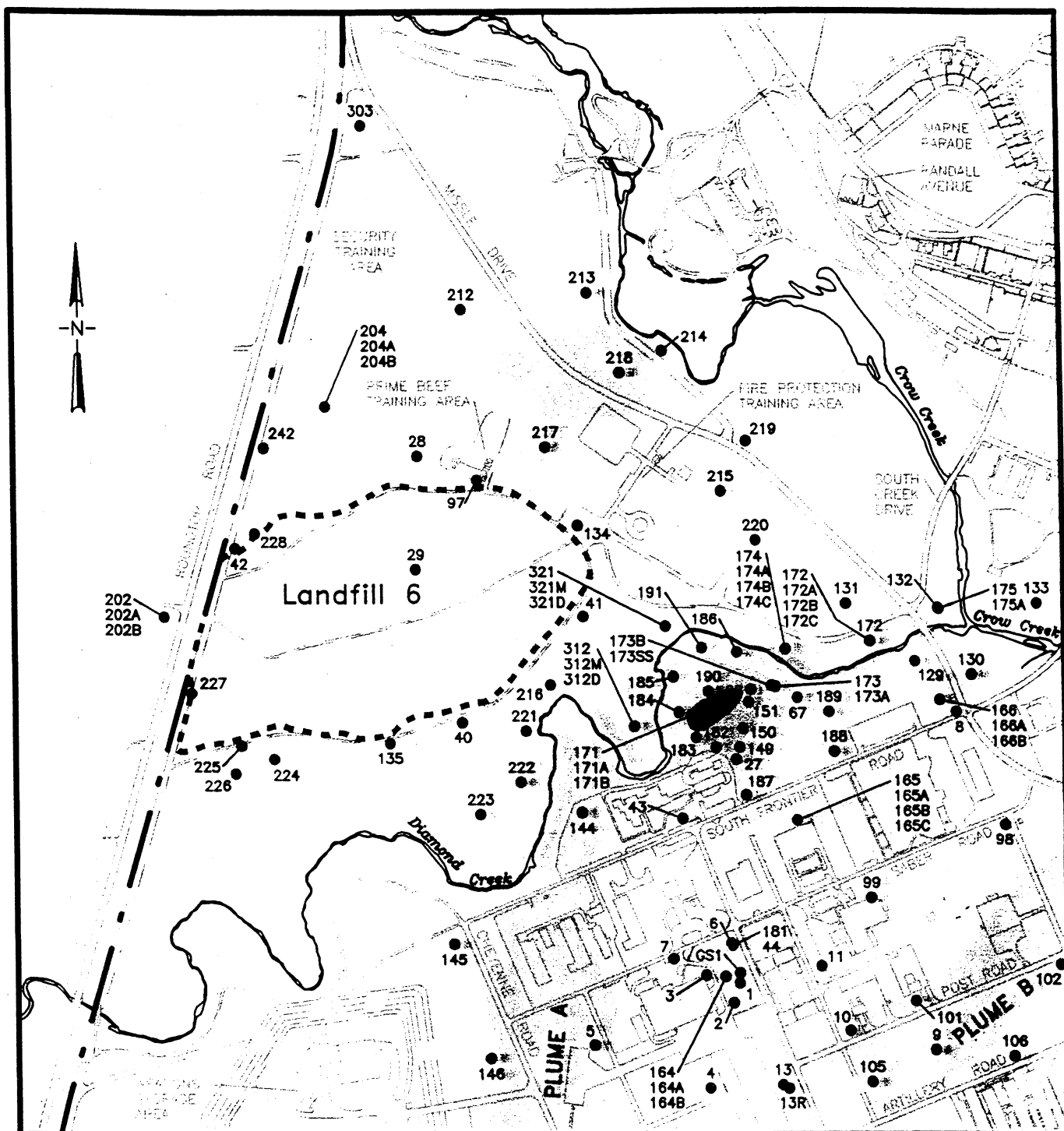
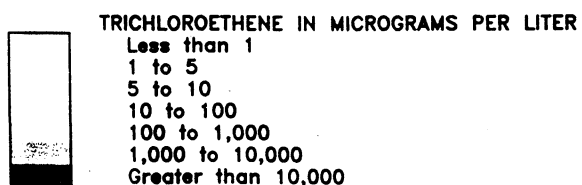


Figure 1. – Location of Landfill 6, F. E. Warren Air Force Base, Wyoming



0 800 1,600 FEET
0 200 400 METERS



--- APPROXIMATE BOUNDARY OF LANDFILL
● MONITOR WELL AND NUMBER

Figure 2. Landfill 6

and housing area being transported to the landfill and covered with soil on a daily basis. The landfill was closed for refuse disposal in September 1984. Coal ash from the Base coal-fired, high-temperature-hot-water plant continued to be deposited in the landfill until December 1989. The Base-shop wastes disposed of at the site included waste oils, solvents, ethylene glycol, silicone oil, hydraulic fluid, mineral spirits, and waste JP-4 jet fuel. Batteries and battery acid were disposed of until 1982; out-of-date pesticides, oil-based paints, and asbestos insulation were landfilled until closure in 1984. No burning of landfill materials is believed to have occurred at LF6.

On September 26, 1991, a Federal Facility Agreement (FFA) was signed between the USAF, EPA, and WDEQ. The FFA is required by Section 120 of CERCLA. The FFA provides the framework for EPA and WDEQ oversight of continuing remedial investigations at the Base and further identifies USAF investigation activities and schedules. The Base provides documents to EPA and WDEQ for review and concurrence, in accordance with the FFA.

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

The USAF has prepared and implemented a community relations plan (CRP) in accordance with CERCLA requirements, and the FFA. The CRP describes community involvement activities the USAF will undertake during remedial activities at F. E. Warren Air Force Base. The USAF has followed the requirements of the CRP, including issuance of periodic fact sheets, holding public meetings, and providing the opportunity for public comment throughout the LF6 investigation.

The Administrative Record has been established at an on-Base location and at the Laramie County Public Library. The USAF has prepared and distributed fact sheets to all persons or groups identified on the CRP mailing list (approximately 1400).

The announcement of the commencement of the public comment period was made on April 8, 1995, through advertisements in the Wyoming Tribune-Eagle and in the Casper Star-Tribune. These advertisements announced and outlined the public comment period and public meeting. The public comment period was scheduled from April 17 to May 16, 1995. A public meeting was held at Cheyenne, Wyoming on April 25, 1995. An official transcript of the meeting has been prepared and placed in the Administrative Record.

In addition to the newspaper announcements, the USAF also issued a press release and an article appeared in the Base Sentinel newspaper on April 21, 1995. The public meeting was also announced during the "Military Minute" on Cheyenne radio station KRAE. An article describing the public meeting was published in the Wyoming Tribune-Eagle on April 26, 1995.

Responses to all comments on the Proposed Plan are presented in the Responsiveness Summary of this ROD.

4.0 SCOPE AND ROLE OF OPERABLE UNIT

The selected interim action LF6 is a source control action that includes capping and active gas venting system. Operable Unit (OU) 3 is the third of ten OUs to be investigated under terms of the Federal Facility Agreement (FFA). The others are: OU1 - Spill Sites 1 through 7; OU2 - Facility Ground water (except at OUs 3, 6, 7 and 8); OU4 - Acid Dry Wells; OU 5 - Fire Protection Training Area 2; OU 6 - Open Burning/Open Detonation Area; OU7 - Firing Range(s); OU 8- Landfill 5; OU9- Landfills 2 and 4; and OU10- Landfill 7 and Fire Protection Training Area 1. The ground water contamination associated with OUs 3, 6, 7, and 8 will be investigated and remediated as part of these OUs, separate from OU2. All of the investigations are being conducted in accordance with the FFA. It is anticipated that the ROD for OU2 will be issued after the RI has been completed for the other operable units.

5.0 SITE CHARACTERISTICS

LF6 is the source of several chemicals found downgradient of the landfill at concentrations in excess of Federal drinking water standards. The chemical most frequently detected is trichloroethylene (TCE), considered to be a suspected carcinogen.

No specific characterization has been performed for the landfill contents. Based on the EPA guidance on presumptive remedies for landfills, the source of contamination is considered to be the entire landfill area.

Cores from 30 shallow-soil boreholes were sampled and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), organo-chlorine pesticides, polychlorinated biphenyls (PCBs), metals, anions, and moisture content. One VOC, acetone, was detected once, at a concentration of 0.10 mg/kg. No target analyte SVOCs were detected; however a number of SVOC tentatively identified compounds (TICs) were found in the soils. Although pesticides were initially detected in five of the 30 samples, only 4,4'-DDT and beta-BHC in one sample each were verified. Surface samples from seven selected boreholes, and from two sites where ash was observed on the landfill surface, were analyzed for polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). One such compound was detected in one of the nine samples.

Soil-gas samples were analyzed from 30 sites corresponding to the 30 soil boreholes. Very high concentrations of methane, in excess of 2000 parts per million, were observed in

three localized areas. The largest of these areas measured about 250 feet by 100 feet. Samples from seven of the other 27 sites showed detectable contaminants - primarily vinyl chloride.

A series of 87 test wells were installed and sampled. Evaluation of data from these wells was used to locate 31 monitor wells. Ground-water samples from the monitor wells were analyzed for VOCs, SVOCs, organo-chlorine pesticides and PCBs, ethylene glycol, metals, and anions. TCE was detected in samples from 8 of the 31 wells, with five wells having concentrations in excess of the Maximum Contaminant Level (MCL) of 5 µg/L. The solvent 1,1,1-trichloroethane was detected in water samples from three of the wells, one of which also showed 1,1-dichloroethane. Gasoline components were detected in the sample from one well located within the fire protection area adjacent to the east side of the landfill. No organo-chlorine pesticides, PCBs, or ethylene glycol were verified. Nitrate was detected in samples from six of the wells at concentrations above the MCL of 10 mg/L. Samples from four monitor wells were analyzed for PCDDs and PCDFs, with no detects. Total dissolved solids (TDS) above the Secondary Maximum Contaminant Level (SMCL) of 500 mg/L was detected in samples from two of 12 wells tested.

Surface-water samples from three locations on Diamond Creek and three locations and one spring on Crow Creek were analyzed for VOCs, SVOCs, organo-chlorine pesticides, PCBs, ethylene glycol, PCDDs, PCDFs, metals, chromium (VI), and anions. These samples represented conditions for the low-flow period of the year, during which the two watercourses are gaining streams in the areas sampled. TCE (at 3.4 µ/L) and cis-1, 2-dichloroethene (1.6 µ/L) were detected in one sample from Diamond Creek site D3. No SVOCs, ethylene glycol, or pesticides were verified. One dioxin compound (OCDD) was detected in one sample from Diamond Creek (D2 at 140 pg/L) and the sample from the spring on Crow Creek (SP4 at 150 pg/L). Lead was the only metal detected at or near the MCL, at a concentration of 0.0065 mg/L in one of eight samples.

Bed material was sampled and analyzed from two locations on Diamond Creek and three on Crow Creek. Like the surface-water samples these samples represent low-flow conditions. Analyses included VOCs, SVOCs, organo-chlorine pesticides, PCBs, PCDDs, PCDFs, metals, anions, and moisture content. No VOCs, SVOCs, organo-chlorine pesticides, PCBs, PCDDs, or PCDFs were detected. The metals concentration in the bed-material samples from the upstream parts of Diamond Creek and Crow Creek on the Base generally were higher than those reported further downstream on Crow Creek on the Base. Lead was detected at 1,620 mg/kg where Diamond Creek enters the Base. Chloride and sulfate concentrations in the bed-material samples generally were higher than in surface-soil samples.

Based on the potential pathways that exist at landfill 6, as well as the current state of the landfill, there are two primary pathways by which contaminants can migrate to potential receptors.

Leaching of contaminants from landfill 6 to ground water is the main release mechanism for contaminant movement. This mechanism occurs as the result of the rain water infiltration and reaction with landfill contents, or from the movement of liquid waste from the landfill to ground water. During transport by ground water, contaminants may undergo degradation and transformation reactions that produce additional contaminants over time. Movement of ground water away from the landfill towards Crow Creek transports contaminants towards potential receptors. Primary receptors include the riparian environment at Crow Creek; secondary receptors include people using the creek for recreational activities. The documented existence of a TCE plume extending from landfill 6 to Crow Creek establishes that the ground-water pathway is currently impacting this water course.

Contaminant transport by overland flow of surface water is considered a potential migration pathway, although it is probably minor due to the semiarid climate and the relatively flat topography of the site. However, contaminant transport may occur during periods of heavy rainfall or rapid snowmelt.

Air-born dispersion of volatilized organic compounds and fugitive dust emissions are aspects of the second pathway. Organic contaminants in soil at LF6 consist of SVOCs that are readily sorbed to particulates and susceptible to transport. Inorganic contaminants consist of metals that also exist primarily in the solid phase and thus are readily transported by wind. Although the landfill has a soil and grass cover, without knowledge of the design, depth, and condition of the cover, future direct contact with the landfill contents cannot be precluded, if the selected remedy is not implemented.

Due to the proximity of Diamond Creek to the landfill, a third pathway of surface transport of contaminants by erosion is possible, but limited due to the flat topography.

6.0 SUMMARY OF SITE RISKS

A streamlined risk assessment (SRA) was conducted for LF6 to determine the potential human exposures and risks from chemicals under-baseline conditions. Surface soil contaminants of concern are: beta-BHC, 4,4'-DDT, octachlorodibenzo-p-dioxin, aluminum, arsenic, barium, beryllium, chromium, cobalt, lead, manganese, nickel, and vanadium. The ground-water contaminants of concern are: Trichloroethylene, dichlorofluoromethane, trichlorofluoromethane, butylbenzene, p-isopropyltoluene, cis-dichloroethene, n-propylbenzene, cis-1,2-dichloroethene, 1,1,1-trichloroethane, 1,2,4-trimethylbenzene, total xylenes, aluminum, arsenic, barium, manganese, nitrate, and sulfate.

Landfill 6 is the source of several chemicals found at concentrations in excess of Federal drinking water standards. The most prevalent is trichloroethylene (TCE), considered to be a suspected carcinogen. The carcinogenic risk from exposure to TCE in ground water is within the target risk range of 10^{-4} to 10^{-6} (1 in 10,000 to 1 in 1,000,000).

Potential carcinogenic health effects were identified on the basis of the reasonable maximum exposure (RME) calculations for both the residential and occupational scenarios. The risk-based equations used to compute the preliminary remediation goals (PRGs) were derived to reflect the potential risk from exposure to a single chemical, given a specific pathway, medium, and land-use combination.

The use of the PRGs serves a two-fold purpose for risk characterization. First, the comparison of the site and COC-specific RME concentration with the corresponding PRG gives an immediate indication that a potential risk may exist when the PRG concentration is exceeded. Second, the risk corresponding to the site and COC-specific RME can be calculated. Both of these functions are useful when performing a risk screening. Also, as part of the risk characterization phase of this SRA, the highest potential cumulative risks associated with ground water were determined on the basis of a one acre residential plot exposure unit area. The following is a summary of the SRA findings:

Residential Carcinogenic Ground Water Risk: The residential carcinogenic ground water risk was estimated to range from 7.7×10^{-7} to 2.6×10^{-4} .

Arsenic accounted for the highest potential risk estimate at 2.6×10^{-4} . TCE accounted for the next highest risk estimate at 1.2×10^{-5} .

Occupational Carcinogenic Ground Water Risk: The occupational carcinogenic ground water risk was estimated to range from 4.1×10^{-7} to 1.5×10^{-4} .

Cumulative Residential Soil Carcinogenic Risk: 7.0×10^{-6} .

Cumulative Occupational Soil Carcinogenic Risk: 2.0×10^{-7} .

Potential noncarcinogenic health effects were identified on the basis of the RME calculations for both residential and occupational exposure scenarios. Manganese accounted for the highest RME residential Hazard Quotient at 2.4 and a Hazard Index of 2.6.

Although an ecological investigation was conducted, an ecological risk assessment was determined to not be necessary since the remedy (capping the landfill) will mitigate any ecological risks.

The selected interim action will:

- Decrease the potential for contamination of ground water by reducing the movement of contaminants from the landfill.
- Provide protection against direct contact with the landfill contents.
- Control surface water (both run on and run off) and erosion.
- Provide protection to human health by eliminating exposure to contaminant vapors and contaminated dust particulate.
- Eliminate direct contact with the landfill contents by constructing a RCRA cap over the landfill, meeting RCRA landfill closure requirements, and implementing deed restrictions to prohibit residential development of the site.
- Reduce the potential for landfill gas migration by installing an active landfill gas venting system. The number of gas vents shall be determined during the remedial design. The landfill gas venting system shall meet ARARs.

The function of this interim action is to control LF6 as a source of ground-water contamination by reducing infiltration and the downward movement of contaminants to the ground water and to reduce the risks associated with exposure to contaminated materials.

Actual or threatened releases of hazardous substances from the landfills, if not addressed, may present a current or potential threat to public health and the environment.

7.0 DESCRIPTION OF ALTERNATIVES

Three alternatives for the interim remedial action were evaluated as part of the detailed analysis in the focused feasibility study. All three alternatives are summarized in this section. None of the alternatives are expected to be the final remedy for LF6. Institutional controls are included for all alternatives. The purpose of these institutional controls is to limit direct exposure to landfill contents and contaminated soils and to protect the integrity of the remedy. Deed restrictions will not allow subsurface development (excavation) or vehicular traffic at LF6. Implementing institutional controls will include:

- A continuing order of the Base Commander requiring implementation of the landfill restrictions as long as the property is owned by F. E. Warren AFB.

■ Upon completion of construction at LF6, the Air Force will file notice of these restrictions in the real- property records of the county in which the landfill is located. Before transfer of the property, the Air Force will provide a deed covenant notifying the transferee of the locations and the restrictions on the use of the areas.

■ Fencing the landfill area and placing warning signs for the duration of the remedial action. Additional deed restrictions may be required for effective implementation of other technologies.

Alternative 1 is no action. Evaluation of the "no action" alternative is required by the National Contingency Plan to be used as a baseline comparison for other alternatives. Under this alternative the Air Force would take no action at the landfill to prevent exposures to contamination.

Alternative 2 is a compacted soil cap with a gas venting system. This alternative consists of the construction of a single-barrier compacted-soil cap to cover the entire surface of the landfill. This cap will be designed such that it meets the minimum permeability requirements of the Resource Conservation and Recovery Act (RCRA), subtitle D, so as to reduce infiltration of water from the ground surface to the landfill contents. The single-barrier compacted-soil cap consists of a compacted clay layer overlain by a gravel drainage layer. A final soil layer and vegetative soil layer would be placed as a top cover to protect the cap from erosion and other weather effects. Surface water diversion and erosion and ponding prevention would be included as an integral part of the topsoil grading design. Methane gas would be controlled with an active venting system, where pumped gas vent wells are used to provide positive reduction of gas pressures. Uncontaminated cap and topsoil materials would be hauled to the landfill from a borrow source. Long-term periodic monitoring of ground water would be performed. This alternative will comply with Resource Conservation and Recovery Act (RCRA) subtitle D cap requirements.

Alternative 3 is a composite cap with a gas venting system. This alternative consists of the construction of a multiple-barrier cap to cover the surface of the landfill. A composite barrier consists of a compacted clay layer covered by a synthetic liner. This, in turn, is overlain by a drainage layer. A final soil layer and vegetative soil layer placed as a top cover serves to protect the cap from erosion and other weather effects. Surface water diversion and erosion and ponding prevention would be included as an integral part of the topsoil grading design. Any liquid that percolates through the top soil cover is collected by the drainage layer. This landfill cap will be designed to meet the permeability requirements of RCRA subtitle C, so as to reduce infiltration of water from the ground surface to the landfill contents. Methane gas would be controlled with an active venting system to provide positive reduction of gas pressures.

Uncontaminated cap and topsoil materials would be hauled to the landfill from a borrow source. Long-term periodic monitoring of ground water would be performed.

8.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

Alternatives 2 and 3 are protective of human health and the environment because the cap will reduce the rate at which contaminants move to the water table and prevent direct exposure to surface contaminants. A reduction in the rate at which contaminants reach the water table will decrease the concentrations of those contaminants in the shallow aquifer. Compliance with Federal and State applicable or relevant and appropriate requirements (ARARs) relevant to the landfill cap will be assured.

The preferred alternative is number 3. Alternative number 3 would achieve risk reduction by limiting exposure and reducing the transport of contamination to ground-water by reducing infiltration. The composite cap is potentially more reliable than the compacted-soil cap because of the synthetic membrane liner. Based on the information available at this time, the Air Force believes the preferred alternative will be protective of human health and the environment and will comply with the ARARs. As an interim action, the preferred alternative is expected to be consistent with the final remedy for Operable Unit 3.

Each of the alternatives has been evaluated against nine criteria established to provide a uniform basis for comparison.

1. Overall Protection: The "no action" alternative will not treat, remove, or provide any barrier other than the minimal existing cover to landfill contents. With no impediment to infiltration of precipitation, leaching and downward movement of contaminants will continue through the soil toward the water table if no action is taken. Air-born dispersion of volatilized organic compounds and fugitive dust emissions would remain a problem. The "no action" alternative does not guarantee overall protection of human health and the environment. This alternative is not considered further in this analysis as an option for the landfills. Both capping alternatives will prevent direct contact with landfill contents and contaminated dust. Both capping options will also prevent the transport of volatile organic compounds to the atmosphere and will reduce the rate at which chemicals move to the water table.

2. Compliance with ARARs: Alternative 2 would comply with RCRA subtitle D cap requirements but not subtitle C cap requirements. Alternative 3 would comply with relevant and appropriate RCRA subtitle C landfill closure requirements. Both capping alternatives would comply with other applicable or relevant and appropriate State and Federal environmental laws and regulations, except for groundwater chemical-specific ARARs which are temporarily waived using the interim measures waiver.

The Wyoming Water Quality Rules and Regulations, Chapter XVII, Appendix A, risk assessment and fate and transport procedures were considered during the Feasibility Study and in the selection of a remedy for this interim action. The parties to this ROD agree that the selected remedy of a RCRA subtitle C landfill cap meets the intent of this regulation. The parties to this ROD further agree that non-inclusion of Chapter XVII of the Wyoming Water Quality Rules and Regulations as an ARAR in the ROD for this interim action was disputed and will not be raised as a basis for an inconsistent application objection under 42 U.S.C. Section 9621(d)(4)(E) to identification of Chapter XVII as an ARAR for other actions.

A complete listing of the ARARs may be found at Appendix A. Waived groundwater ARARs may be found at Appendix B.

3. Long-Term Effectiveness and Permanence: The capping alternatives leave the landfill contents in place. Both alternatives will require the same institutional controls and regular maintenance to ensure that the caps will continue to provide an appropriate level of protection against direct contact, air transport, and erosion, as well as maintaining a barrier to infiltration. Transport of contaminants to the ground water is diminished by either cap since the reduction of infiltration lessens the amount of leachate produced. The composite cap is potentially more reliable than the compacted-soil cap because of the addition of the synthetic membrane liner.

4. Reduction of Toxicity, Mobility, and Volume through Treatment: Because no treatment technology is proposed under any of the alternatives, the considerations pertaining to treatment technologies are not relevant.

5. Short-Term Effectiveness: The initial preparation for placement of either cap on the landfills would cause disturbance of the existing ground surface. During this operation dust could be generated and volatiles may be released to the air which would pose a minor, but temporary, risk to both workers and the surrounding community. These risks will be minimized by following health and safety procedures. Air monitoring will be used to assess the requirement for temporary control measures during construction.

6. Implementability: The two capping options have no serious implementability problems, and from a technical standpoint, implementation of either alternative should be fairly straightforward. Other than adhering to site safety requirements, no special techniques, materials, or labor would be required to prepare the site and place the compacted soil (single-barrier) cap. All materials and equipment can be obtained locally. The geosynthetics involved in the composite (multiple-barrier) cap require special handling techniques and labor for proper placement of the layers to ensure integrity. Contractors with the appropriate specialized experience are available.

7. **Cost:** The capital cost differences between the two capping alternatives is due entirely to the larger number of materials and special handling required for the composite cap. Yearly operation and maintenance costs are estimated to be the same for both alternatives. The comparison of the estimated project design and implementation costs is as follows:

Alternative 2, Compacted Soil Cap w/ gas venting system, Landfill 6	<u>\$ 11,600,000</u>
ALTERNATIVE 2, 30 YEAR PRESENT WORTH TOTAL	\$ 15,700,000

Alternative 3, Composite Cap w/ gas venting system, Landfill 6	<u>\$ 15,600,000</u>
ALTERNATIVE 3, 30 YEAR PRESENT WORTH TOTAL	\$ 19,700,000

8. **State Acceptance:** The State of Wyoming supports the preferred alternative as a partial remedy, but has expressed concerns regarding the potential for landfill contents to be in contact with ground water and for liquid wastes to be present in the landfill. These issues are more fully discussed in Section D., STATE CONCERNS, of the Responsiveness Summary for the Record of Decision.

9. **Community Acceptance:** The general community, consisting of the residents of the City of Cheyenne, Laramie County, and F. E Warren AFB, have not expressed any comments or concerns and apparently support the preferred alternative.

The Air Force's selected remedy for Operable Unit 3, Landfill 6 is alternative number 3.

9.0 STATUTORY DETERMINATIONS

The Air Force's selected remedy for Operable Unit 3, Landfill 6 is alternative number 3. The selected remedy meets the statutory requirements of Section 121 of CERCLA as amended by SARA. These statutory requirements include protectiveness of human health and the environment, compliance with ARARs, cost effectiveness, utilization of permanent solutions and alternative treatment technologies to the maximum extent practicable and preference for treatment as a principal element. However, because treatment of the principal threats of the site was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. The size of the landfill and the fact that there

are no apparent on-site hot spots that represent the major sources of contamination preclude a remedy in which contaminants could be excavated and treated effectively. The selected remedy does comply with Section 300.403(a)(iii)(B) of the National Contingency Plan (NCP) which states that engineering controls, such as containment, should be used for wastes that pose a relatively low long-term threat or where treatment is impracticable. The preamble to the NCP identifies CERCLA municipal landfills as a type of site where treatment of the waste may be impracticable because of the size and heterogeneity of the contents. Subsequent actions are planned to address the downgradient contamination associated with Landfill 6.

Since ground water chemical-specific ARARs will not be met by this action, these requirements are temporarily waived using the interim measures waiver, granted through the signing of this Record of Decision. The interim measures waiver will not cause additional movement of contaminants, complicate the site response, present an immediate threat to public health or the environment, or interfere with or delay the final remedy. The ground water chemical-specific ARARs will be met in the final cleanup action for Operable Unit 3-Landfill 6.

10.0 EXPLANATION OF SIGNIFICANT CHANGES

The Proposed Plan was released for public comment in April, 1995. The preferred alternative was for a source control action that includes capping and an active gas venting system, and that this action is protective of human health and the environment. The USAF, EPA, and WDEQ reviewed all written and verbal comments submitted during the public comment period. It was determined that no significant changes were necessary to the preferred alternative.

RESPONSIVENESS SUMMARY FOR THE RECORD OF DECISION INTERIM ACTION, OPERABLE UNIT 3: LANDFILL 6

INTRODUCTION

The responsiveness summary is organized into sections as follows:

- A. Overview
- B. Background on Community Involvement
- C. Summary of Comments Received
- D. State Concerns

Attachment: Community Relations Activities at F. E. Warren Air Force Base

A. OVERVIEW

At the time of the public comment period, the preferred alternative for the interim action at Operable Unit 3, Landfill 6, at F. E. Warren Air Force Base, had been selected by the Air Force, with EPA and Wyoming DEQ concurrence and was presented in the Proposed Plan. The preferred alternative is a source control action that includes capping and an active gas venting system.

Based on the public's response and comments received during the public comment period, there are no significant objections to the preferred alternative.

B. BACKGROUND ON COMMUNITY INVOLVEMENT

Community interest in CERCLA/IRP (Installation Restoration Program) activities at F. E. Warren Air Force Base has waxed and waned over the years since the records search and interviews conducted for the Air Force in September 1985. No specific individuals or organizations have been consistently involved over this period, although numerous groups and persons have been involved from time to time. There were no concerns expressed during the OU3, Landfill 6. Remedial Investigation, prior to the public comment period.

C. SUMMARY OF COMMENTS RECEIVED

The public comment period on the Proposed Plan for the Operable Unit 3: Landfill 6 interim action at F. E. Warren Air Force Base was held from April 17, 1995 to May 16, 1995. Comments received during this time are summarized below. Similar comments have been combined where possible to prevent duplication of responses. There were no specific legal or technical questions.

D. STATE CONCERNS

The State of Wyoming is concerned that waste materials contained in Landfill 6 may be residing in ground water at times when the water table is elevated. As has been described in the Record of Decision (ROD), the installation of a cap will significantly reduce the potential for precipitation to infiltrate the landfill contents and contribute to ground water leachate. However, the cap will not prevent the ongoing contamination of ground water if the landfill materials are in contact with ground water. Additionally, the potential for liquid wastes to be present in the landfill exists which would also constitute a source of ground water contamination not addressed by the installation of the cap. For these reasons, the State of Wyoming supports the construction of the cap as a partial solution. The outstanding issues of direct contact between the landfill materials and ground water, and possible liquid wastes within the landfill are to be investigated and addressed during the remaining investigations and comprehensive ROD at the completion of investigation and feasibility studies for the site.

ATTACHMENT A
COMMUNITY RELATIONS ACTIVITIES
At
F.E. WARREN AIR FORCE BASE

OVERVIEW

The unique community involvement needs of F. E. Warren Air Force Base IRP/CERCLA activities are addressed in the Community Relations Plan (CRP). In late 1990, during plan development, interviews were held with 56 people representing F. E. Warren Air Force Base, other Federal agencies, State, city and county agencies, community groups, well owners, and other individuals. The most significant issues identified in the interviews were concerns about potential drinking water contamination and about the community involvement process. A brief description of each of the activities which have been developed to address the unique F. E. Warren Air Force Base situation is contained in this attachment.

HISTORY OF COMMUNITY INVOLVEMENT

News releases and articles in the Cheyenne and F. E. Warren Air Force Base newspapers have been part of the IRP process since 1985. Briefings were provided to congressional staffs, the Governor, and mayor in addition to Federal agencies, Wyoming State departments, and local government officials directly responsible for resources potentially affected by the IRP process. Presentations were made to various community groups such as Optimist Club, Military Affairs Committee, Civilian Advisory Council, Society of American Military Engineers, and Wyoming Against MX. Information was disseminated at F. E. Warren Air Force Base through the Commanders Call which reaches all enlisted personnel through the command structure.

The Technical Review Committee was established as part of the IRP/Superfund process and had its first meeting in May of 1988. The three initial public members were nominated by the Governor of Wyoming, Mayor of Cheyenne, and Laramie County Commission. This committee's membership and a general knowledge of the community, served as the initial basis for the selection of people to be interviewed. One of the peripheral goals of the interview process was to provide a list of potential candidates for the public representatives on the TRC.

An environmental display was presented in July 1990 in the Base Exchange Mall. Pictures of all IRP sites were displayed. Site specific fact sheets, environmental brochures, and EPA literature were made available.

The process designed to tailor the CRP to local concerns, needs, and conditions began in February 1990 with interviews of a former base commander and a concerned citizen who are

both involved in a variety of groups within the community. Interviews were also held at the regular March meeting of Wyoming Against MX, attended by 4 Air Force, 2 EPA, and 1 State official working on the IRP/Superfund process, in addition to 10 members of the group itself. These initial public contacts focused on identifying critical public concerns.

The purpose of the community interviews was to identify groups and issues which may relate to the F. E. Warren Air Force Base IRP/Superfund process. Thirty-four interviews were conducted with 56 people, either representing themselves or 20 groups within the area. The Wyoming Department of Environmental Quality and City/County Health were particularly helpful in accompanying interviewers.

Among the people interviewed were congressional staffers, an official Air Force representative, F. E. Warren Air Force Base housing residents, non-DOD Federal agencies and state and local government agencies. Among community groups a wide range of interests were sampled. There were three individuals identified as involved with a variety of groups, but viewed as reputational leaders beyond their group membership.

Special emphasis was placed on interviewing those who rely on private wells adjacent to F. E. Warren Air Force Base for drinking water. An introductory letter, Fact Sheet, and discussion guide were prepared for the interviews. The Fact Sheet was actually a status report on the IRP/Superfund process with a brief description of each of the sites. The purpose of the status report was to provide information and a basis of discussion for those who might not have heard of the program and included an installation map with the sites and key features of F. E. Warren Air Force Base and immediate surrounding area. These fact sheets and the introductory letter were made available for distribution to all interested parties.

Interviews took place in October and November 1990, with a few follow-up interviews and phone conversations continuing into December.

During the interview process it was recognized that the neighborhood located on the south boundary of F. E. Warren Air Force Base depends on domestic wells for drinking water. An agreement was made with the City/County Health Department and Wyoming Department of Environmental Quality to process a small number of water samples, if residents requested it. Sample collection was done December 4th and 5th, 1990, by a conjunctive effort of DEQ, City/County Health, and EPA personnel.

ISSUES AND CONCERNS

Based on the community interviews, IRP/Superfund activities are not a source of significant concern to the greater Cheyenne community. This may be due to the public's belief

that the contamination is contained within the boundaries of F. E. Warren Air Force Base. The potential for drinking water contamination is the most significant issue associated with the IRP/Superfund process. Awareness of this issue beyond those who were involved with the process was practically nonexistent.

None of the drinking water well users contacted in the interviews were aware of the IRP/Superfund process or the potential contamination. The initial reaction of well owners was extreme concern. However, after being provided information about the IRP/Superfund activities and an opportunity to have wells tested by City/County Health and the Wyoming Department of Environmental Quality, their concern decreased. They continue to have a high level of interest and awareness, and want to be kept informed on a regular basis.

The need to keep the community informed and involved was mentioned frequently in the interviews. In the business community, there was confidence in the Air Force's ability to solve the problem. Other groups, such as Wyoming Against the MX, and the potentially affected neighborhoods, indicated a need for greater community information and involvement than had been provided prior to the interviews and adoption of the Community Relations Plan.

The community relations program for the IRP/Superfund activities is designed to inform the public about, and provide opportunities for participation in, the process. To be effective, the community relations program will be responsive to the level of interest expressed by the community. At this time, the primary need voiced by the public is to be kept well informed of the status of activities and to be involved in the decision making process.

The potential for TCE contamination in the ground water surrounding F. E. Warren Air Force Base is the most sensitive issue identified in the community interviews associated with the entire IRP/Superfund process.

SPECIAL CONSIDERATIONS

Interviews with residents in the Nob Hill and Fairacres neighborhoods revealed that direct contact with members of the neighborhood is the most effective method of providing necessary information. This approach was confirmed during 1994 with 5 neighborhood meetings conducted for the two areas as a result of concerns about off base contamination.

ADMINISTRATIVE RECORD REPOSITORY

An Administrative Record Repository containing documentation of the IRP/CERCLA process was established in October 1989 and is maintained at the following locations to insure accessibility.

Laramie County Library 90 CES/CEVR

Reference Section
2800 Central Avenue
Cheyenne WY 82001
Phone (307) 634-3561

Environmental Restoration Section
300 Vesle Drive
F. E. Warren AFB WY 82005-2788
Phone (307) 775-3468

This record is maintained according to EPA guidelines, by the Environmental Restoration Flight, and is updated at least quarterly. The Administrative Record Repository also functions as the required information repository. A copy of the Administrative Record is housed in the Laramie County Library reference section to insure public access.

TECHNICAL REVIEW COMMITTEE

Procedures to establish the TRC began in November 1987. Actual meetings began in May of 1988. They are held quarterly, generally on the fourth Wednesday in January, April, July, and October. TRC public members were nominated by the Governor of Wyoming, Laramie County and the city of Cheyenne, Wyoming. The purposes of the committee are as follows:

1. The purpose of the TRC is to review and comment on Department of Defense actions and proposed actions with respect to releases or threatened releases of hazardous substances into the environment at F. E. Warren Air Force Base, as well as to ensure open communication and exchange of ideas relating to the F. E. Warren Air Force Base IRP and Comprehensive Environmental Response, Compensation, and Liability Act - CERCLA, 1980, Superfund Amendments and Reauthorization Act, 1986.

2. All TRC members understand and agree that the primary purpose and function of the TRC is informational, specifically to foster community and inter-agency awareness and understanding of F. E. Warren Air Force Base actions with respect to the IRP remedial actions related to the releases or threatened releases of hazardous substances at F. E. Warren Air Force Base, Wyoming, and to inform F. E. Warren Air Force Base of community attitudes. The TRC also serves as the entity to deal with public concerns regarding hazardous substance releases and the IRP.

RESTORATION ADVISORY BOARD

In an effort to improve public participation in environmental cleanup activities at F. E. Warren Air Force Base, a Restoration Advisory Board (RAB) has been formed to replace the TRC. The RAB consists of community volunteers and representatives from the Base, EPA and WDEQ. It is chaired by a community member and a senior base official.

The board offers community members the opportunity to provide input to the decision making process used by the base to clean up contaminated sites.

MAILING LIST

A major part of the public relations activities is the mailing list. In an attempt to proactively contact the 2,300 well owners identified in the EPA Superfund ranking, F. E. Warren sent a general mailing to well owners within a 3-mile radius. The Wyoming State Engineer's Office provided the mailing list of well owners. The mailing included a brief status report and a coupon to be mailed back if the well owner wanted to be added to the mailing list for distribution of later status reports. This activity resulted in the current list that has about 1450 names on it. The mailing list is maintained in the F. E. Warren Air Force Base Public Affairs Office. Status Reports or Fact Sheets are mailed on a quarterly basis. Anyone who desires to be included on the list should contact either of the following offices.

90 MW/PA

5305 Randall Ave

F. E. Warren AFB WY 82005-2271

Phone (307) 775-3381

90 CES/CEVR

300 Vesle Drive

F. E. Warren AFB WY 82005-2788

Phone (307) 775-3468

INFORMATION CONTACT

An information contact person has been designated within the F. E. Warren Air Force Base Environmental Restoration Section to maintain regular contact with the community. This person is responsible for responding to requests for information and planning and scheduling activities included in the plan. The preparation of materials for public distribution will be coordinated with the Public Affairs Office. General public information requests should be directed to (307) 775-4353. The media contact for F. E. Warren Air Force Base is the Public Affairs office at (307) 775-3381.

DRINKING WATER WELL SAMPLING

City/County Health Department has been sampling wells south of F. E. Warren Air Force Base since 1988. At the outset of the interview process, it became evident that owners of private drinking water wells south of F. E. Warren Air Force Base were not aware of the IRP/Superfund process or any potential contamination. Air Force concern prompted an agreement for water sampling made with City/County Health and Wyoming State Department of Environmental Quality, Water Quality Section (WDEQ) to provide for the testing of wells for

concerned citizens. The agreement was to cover less than 10 wells. During the interview process, some concerns bordering on alarm were encountered. Such concerns were lowered with the testing procedure. The testing was not part of the technical scientific sampling done for the IRP/Superfund process because the criteria for sampling was solely based on individual citizen concerns. The testing took place on December 4 and December 5, 1990. In addition to the City/County Health and DEQ personnel, two EPA staff from the Denver Office assisted. Sampling was also conducted during June 1991 through July 1992.

In some cases, nitrate concentrations were found to exceed the Federal Drinking Water Standard of 10 milligrams per Liter. The test results were presented by individual meetings with all well owners whose wells were tested. These meetings were held by WDEQ with an EPA toxicologist present. Courtesy copies of the test results were provided by WDEQ to all involved agencies including the Air Force. USAF, WDEQ, and EPA scheduled an availability session to provide an opportunity for Nob Hill and Fairacres residents to discuss the WDEQ testing.

As a result of the remedial investigation work at the landfill sites, residential wells in both neighborhoods were sampled again in 1994. To date, a series of five neighborhood meetings have been held to discuss the sampling results and the options for actions the Air Force is planning to take.

OU3 RELATED ACTIVITIES

Operable Unit 3:Landfill 6 has been addressed in Fact Sheets, Status Reports, newspaper advertisements and articles since Fact Sheet 1 was prepared, by the Air Force, in October 1990 for the initial interviews. Fact Sheet 1 was mailed in May 1991. After the Federal Facility Agreement became effective, a Status Report update was distributed on December 12, 1991, with information on all of the operable units. Since then, the quarterly status update reports have informed the public about OU 3 and Landfill 6 activities on a regular basis.

The Proposed Plan for OU3:LF6 was prepared in April, 1995. A display advertisement concerning the Proposed Plan and the public meeting was placed in the Wyoming Tribune-Eagle on April 8, 1995. Another public announcement was placed in the Casper Star-Tribune on April 8, 1995, and a copy of the Proposed Plan was sent to all persons on the mailing list. A copy of the Proposed Plan was placed in the Administrative Record and the Laramie County Library Records Repository on May 15, 1995. All of the newspaper advertisements and the mailings were coordinated between the Air Force, EPA and Wyoming DEQ before publication or distribution. In addition to the paid advertisements, the Air Force issued press releases which resulted in articles published in the Wyoming Tribune-Eagle on April 26, 1995, and the F. E. Warren Air Force Base Sentinel on April 21, 1995.

Appendix A

**Federal and Wyoming State
Applicable, or Relevant and Appropriate Requirements (ARARs)**

Table A-1 - Federal Chemical-Specific ARARs

(USC, United States Codes; CFR, Code of Federal Regulations; Statute; Exec., Executive; DOT, Department of Transportation; FS, Feasibility Study)

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
<u>Clean Water Act</u>	33 USC 1251-1376			
USEPA Toxic Pollutant Standards	40 CFR 129	Establishes effluent standards or prohibitions for certain toxic pollutants	No/No	Listed toxins not detected in ground-water or surface water at site.
<u>Clean Air Act</u>	42 USC 7401-7642			
National Primary and Secondary Ambient Air Quality Standards	40 CFR 50	Establish standards for ambient air quality to protect public health and welfare (including standards for particulate matter and lead)	Yes/NA	Emissions from interim action remediation process will be subject to NAAQS unless state standards are more stringent.
National Emission Standards for Hazardous Air Pollutants	40 CFR 61, Subpart A	Establish regulatory standards for specific hazardous air pollutants	No/Yes	Current assessments indicate regulation is not relevant and appropriate, but venting of landfill gases reaching regulatory thresholds could possibly make this regulation relevant and appropriate.
Standards of Performance for New Stationary Sources	40 CFR 60, Subpart WWW (Proposed)	Establish performance standards for venting of landfill gases as a type of new stationary source.	No/No	Proposed regulation establishing standards for landfills as specific sources of air pollution, if promulgated, will be considered during remedial design phase.
<u>Resource Conservation and Recovery Act</u>				
Hazardous Waste Management System: General	40 CFR 260	Establish definitions as well as procedures and criteria for modification or revocation of any provision in 40 CFR Parts 260-265	No/No	Involved as needed to implement other 40 CFR 264 substantive requirements.
Identification and Listing of Hazardous Waste	40 CFR 261	Define those solid wastes which are subject to regulations as hazardous wastes under 40 CFR 264	Yes/NA	Applicable in identifying listed or characteristic hazardous waste in landfill subject to 40 CFR 264 substantive requirements.
Land Disposal Restrictions	40 CFR 268	Identify hazardous wastes that are restricted from land disposal and defines those limited circumstances under which a prohibited waste may continue to be land disposed	No/No	Interim action will generate no prohibited wastes beyond boundaries of site.

**Table A-1 - Federal Chemical-Specific ARARs
(Continued)**

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
<u>Hazardous Chemical Reporting Community Right-To-Know</u>	40 CFR 370	Establish reporting requirements which provide the public with important information on the hazardous chemicals in their communities	No/No	Independent administrative requirements, but not substantive standards.
Corrective Action for Solid Waste Management Units	55 FR 30798		No/No	
Standards for the Identification and Listing of Hazardous Wastes	57 FR 21450		No/No	Interim action will generate no wastes beyond boundaries of site.
Land Disposal Restrictions for Newly Listed Wastes and Contaminated Debris	59 FR 958		No/No	Interim action will generate no wastes beyond boundaries of site.

Table A-2 - State Chemical-Specific ARARs

[CFR, Code of Federal Regulations; P.L., Public Law; W.S., Wyoming Statute]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
<u>Wyoming Environmental Quality Act</u>	W.S. 35-11-101 to 35-11-1428			
<u>Wyoming Environmental Quality Act, Art. 2</u>	W.S. 35-11-201	Discharge or emission of air contaminants	Yes/NA	Compliance with state air quality numeric and other substantive requirements identified as ARARs satisfies all requirements of this provision.
<u>Wyoming Air Quality Standards and Regulations</u>				
	Section 2	Definitions	No/No	Involved as needed to implement other WAQS requirements.
	Section 3 (b)	Total Suspended Particulates	Yes/NA	Emissions from interim action will be subject to standards.
	Section 4	Sulfur Oxides	Yes/NA	Emissions from interim action will be subject to standards.
	Section 6	Sulfation	Yes/NA	Emissions from interim action will be subject to standards.
	Section 7	Hydrogen Sulfide	Yes/NA	Emissions from interim action will be subject to standards.
	Section 8	Photochemical Oxidants	No/No	No photochemical oxidants anticipated during interim action.
	Section 9	Hydrocarbons	Yes/NA	Emissions from interim action will be subject to standards.
	Section 10	Nitrogen Oxides	No/No	Emissions from interim action will be subject to federal standards.
	Section 11	Fluorides	No/No	No fluoride emissions anticipated during interim action.
	Section 12	Carbon Monoxide	No/No	Emissions from interim action will be subject to federal standards.

**Table A-2 - State Chemical-Specific ARARs
(Continued)**

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
	Section 26	Ambient Air Quality Standard for Lead	No/No	Emissions from interim action will be subject to federal standards.
<u>Wyoming Environmental Quality Act, Article 3</u>	W.S. 35-11-301	Prohibits certain acts without a permit	Yes/NA	Although there is no federal counterpart which meets or exceeds the requirement that there be no threat to pollute the waters of the state, the selected remedy of a RCRA subtitle C landfill cap will comply with and meet the intent of this requirement for this interim action. The selected remedy will adequately reduce any threat to groundwater or surface water quality from migration of landfill contaminants resulting from infiltration or surface runoff of precipitation. Further, compliance with state water quality substantive requirements (permits are not required) identified as ARARs satisfies all requirements of this provision.
<u>Wyoming Water Quality Rules and Regulations</u>				
	Chapter I	Quality Standards for Wyoming Surface Waters	Yes/NA	Site runoff will be subject to substantive chemical-specific numeric standards for surface waters and discharges to surface waters, if more stringent than federal standards. Comments to W.S. 35-11-301 above apply to Chapter I, section 1, prohibiting the threatening of violating a surface water quality standard.
	Chapter XVII	Underground Storage Tanks	No/No	See Record of Decision, Section 8.0.
<u>Department of Environmental Quality Consolidated Hazardous Waste Rules and Regulations</u>				
	Chapter I	General Provisions	No/No	Involved as needed to implement other CHWR requirements.
	Chapter II	Identification and Listing of Hazardous Wastes	No/No	Interim action will generate no wastes beyond boundaries of site.

Table A-3 - Federal Action-Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; P.L., Public Law; Stat., Statute; Exec., Executive; DOT, Department of Transportation]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
<u>Safe Drinking Water Act</u>	42 USC 300g			
Underground Injection Control Regulations	40 CFR 144 to 147	Establishes regulations for subsurface injections for protection of ground water used for drinking water	No/No	Interim action does not include injection.
<u>Clean Water Act</u>	33 USC 1251-1376			
NPDES Storm Water Regulations	40 CFR 122	Establishes requirements for discharge of storm water.	Yes/NA	Storm water runoff may occur from the site making substantive requirements applicable.
National Pretreatment Standards	40 CFR 403	Establishes standards for controlling pollutants which pass through or interfere with treatment processes in POTW or which may contaminate sewage sludge	No/No	Interim action does not include pretreatment.
Dredge and Fill	40 CFR 230 33 CFR 320 to 330	Establishes requirements for permits to authorize the discharge of dredged or fill material into navigable waters	No/No	Interim action does not include discharge of dredged or fill material
USEPA Toxic Pollutant Standards	40 CFR 129	Establishes effluent standards or prohibitions for certain toxic pollutants	No/No	Listed toxins not detected in groundwater or surface water at site.
<u>Clean Air Act</u>	42 USC 7401-7642			
National Primary and Secondary Ambient Air Quality Standards	40 CFR 50	Establish standards for ambient air quality to protect public health and welfare (including standards for particulate matter and lead)	Yes/NA	Emissions from interim action remediation process will be subject to NAAQS unless state standards are more stringent.
National Emission Standards for Hazardous Air Pollutants	40 CFR 61. Subpart A	Establish regulatory standards for specific air pollutants	No/Yes	Current assessments indicate regulation is not relevant and appropriate, but venting of landfill gases reaching regulatory thresholds could possibly make this regulation relevant and appropriate.

**Table A-3 - Federal Action-Specific ARARs
(Continued)**

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
Standards of Performance for New Stationary Sources	40 CFR 60, Subpart WWW (Proposed)	Establish performance standards for venting of landfill gases as a type of new stationary source.	No/No	Proposed regulation establishing standards for landfills as specific sources of air pollution, if promulgated, will be considered during remedial design phase.
Standards of Performance for Volatile Organic Storage Vessels	40 CFR 60 Subpart Kg	Establishes standards of performance for storage tanks containing volatile organic liquids	No/No	Interim action does not include storage of volatile organic liquids.
Standards of Performance for Incinerators	40 CFR 60 Subpart E	Establishes standards of performance for solid waste incinerators	No/No	Interim action does not include incineration.
<u>Solid Waste Disposal Act</u>	42 USC 6901-6987			
Guidelines for the Land Disposal of Solid Wastes	40 CFR 241	Establish requirements and procedures for land disposal of solid wastes	No/No	Interim action does not include handling residential or commercial sanitary waste.
Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 CFR 257	Establish criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment	No/No	Relevant but not appropriate to selected remedy.
<u>Resource Conservation and Recovery Act</u>				
Hazardous Waste Management System: General	40 CFR 260	Establish definitions as well as procedures and criteria for modification or revocation of any provision in 40 CFR Parts 260-265	No/No	Involved as needed to implement other 40 CFR 264 substantive requirements.
Standards Applicable to Generators of Hazardous Wastes	40 CFR 262	Establish standards for generators of hazardous waste	No/No	If hazardous waste is generated during construction, this regulation would apply.
Standards Applicable to Transporters of Hazardous Wastes	40 CFR 263	Establish standards which apply to persons transporting hazardous waste within the U.S. if the transportation requires a manifest under 40 CFR Part 262	No/No	If hazardous waste is generated during construction, this regulation would apply.

**Table A-3 - Federal Action-Specific ARARs
(Continued)**

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR 264			
General Facility Standards	Subpart B, Section 264.18(b)(1)(ii)	Establishes washout standards for design, construction, maintenance and operation of existing hazardous waste landfills.	No/Yes	Relevant and appropriate if landfill located within a 100-year floodplain as defined in 40 CFR 264.18 (b)(2).
Preparedness and Prevention	Subpart C, Section 264.31	Establishes general requirement for design, construction, maintenance and operation of hazardous waste facilities to minimize the possibility of fire, explosion or unplanned release.	No/Yes	
Contingency Plan and Emergency Procedures	Subpart D	Establishes requirements for a contingency plan and emergency procedure at hazardous waste treatment, storage, and/or disposal facilities	No/No	Involved as needed to implement other 40 CFR 264 substantive requirements.
Manifest System Record Keeping and Reporting	Subpart E	Establishes requirements for the manifest system, record keeping, and reporting at hazardous waste treatment, storage, and/or disposal facilities	No/No	Involved as needed to implement other 40 CFR 264 substantive requirements.
Releases from Solid Waste Management Units	Subpart F, Sections 264.97, 264.98, 264.99	Establishes requirements for detection and monitoring of releases into ground-water from hazardous waste treatment, storage, and/or disposal facilities	No/Yes	Ground-water monitoring requirements applicable. Subpart F concentration limits in Section 264.94 located in Appendix B.
Closure and Post Closure	Subpart G, Sections 264.111, 264.116, 264.117	Establishes general standards for closure and post-closure at hazardous waste treatment, storage, and/or disposal facilities	No/Yes	Interim action qualifies as part of the process of closure. Section 264.116 only applicable to extent of requiring surveyed benchmarks of the landfill.
Financial Requirements	Subpart H	Establishes fiscal requirements for liability insurance and financial assurance for closure and post-closure at hazardous waste treatment, storage, and/or disposal facilities	No/No	Not a substantive requirement
Use and Management of Containers	Subpart I		No/No	Interim action does not include storage of containers of hazardous waste.

**Table A-3 - Federal Action-Specific ARARs
(Continued)**

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
Tanks	Subpart J		No/No	Interim action does not include storage of containers of hazardous waste.
Surface Impoundments	Subpart K	Establishes design and operational requirements for surface impoundments used for treatment, storage, and/or disposal of hazardous wastes	No/Yes	Surface impoundment may be used during construction to control site runoff.
Waste Piles	Subpart L		No/No	Interim action does not include treatment, storage, and/or disposal of hazardous wastes in waste piles.
Land Treatment	Subpart M		No/No	Interim action does not include operation of a hazardous waste land treatment unit.
Landfills	Subpart N	Establishes design and operational requirements for hazardous waste landfills	No/Yes	Interim action does not include operation of a landfill. Standards for closure and post-closure may be used.
Standards for Incinerators	Subpart O		No/No	Interim action does not include operation of an incinerator
Standards for Miscellaneous Units	Subpart X		No/No	Interim action does not include operation of a miscellaneous unit.
Standards for Management of Specific Hazardous Wastes & Specific Types of Hazardous Waste Management Facilities	40 CFR 266	Establish requirements which apply to recyclable materials that are reclaimed to recover economically significant amounts of precious metals including gold and silver	No/No	Interim action does not include recycling of materials
Land Disposal Restrictions	40 CFR 268	Identify hazardous wastes that are restricted from land disposal and defines those limited circumstances under which a prohibited waste may continue to be land disposed	No/No	Interim action does not include land disposal of hazardous waste outside of the site boundary.
Underground Storage Tanks	40 CFR 280	Establish regulations related to underground storage tanks	No/No	Interim action does not involve underground storage tanks.

**Table A-3 - Federal Action-Specific ARARs
(Continued)**

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
Transport of RCRA Wastes to POTW	40 CFR 270.60		No/No	Interim action does not involve transport of waste to POTW.
Criteria for Municipal Solid Waste Landfills	40 CFR 258	Establishes design and operational requirements for municipal waste landfills (RCRA, subtitle D)	No/No	Relevant but not appropriate to selected remedy.
<u>Toxic Substances Control Act</u>	15 USC 2601-2629			
Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions	40 CFR 761	Establish prohibitions of, and requirements for, the manufacture, processing, distribution in commerce, use, disposal, storage, and marking of polychlorinated biphenyls (PCBs) and PCB items	No/No	PCB's have not been detected at the site
Asbestos Abatement Projects	40 CFR 763 Subpart G	Establish requirements which must be followed during asbestos abatement projects	No/No	Asbestos has not been detected at the site.
<u>DOT Hazardous Material Transportation Regulation</u>	49 CFR 170-177	Regulate transportation of hazardous materials	No/No	Interim action does not involve transportation of hazardous waste off site.
<u>Miscellaneous</u>				
Requirements for the Treatment and Disposal of Insecticides, Fungicides and Rodenticides	40 CFR 161	Establishes requirements for the treatment and disposal of concentrated insecticides, fungicides, and rodenticides	No/No	Interim action does not involve the management of concentrated pesticides.
Dioxin-Furan Requirements	40 CFR 766	Establishes requirements for manufacturers, importers and processors to identify substances with regulated dioxins/furans	No/No	Although Dioxin/Furan compounds have been detected in one location at the site, regulation does not address landfills.
Guidelines for Source Separation for Material Recovery	40 CFR 246		No/No	Interim action does not include recycling of materials.
Effluent Guidelines and Standards for the Point Source Category	40 CFR 404-474	Establishes requirements for specific effluent limitations and guidelines and pretreatment standards for specific industrial discharges under NPDES.	No/No	Interim action will involve no industrial operation and none exist at the site.

**Table A-3 - Federal Action-Specific ARARs
(Continued)**

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
Standards for Protection Against Radiation	10 CFR 20		No/No	Although the presence of radioactive contaminants has not been investigated at the site, site history does not include disposal of radioactive wastes
Land Disposal Restrictions for Newly Listed Wastes and Contaminated Debris	59 FR 958		No/No	Interim action will generate no wastes beyond boundaries of site.

Table A-4 - State Action-Specific ARARs

[CFR, Code of Federal Regulations; P.L., Public Law; W.S., Wyoming Statute]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
<u>Wyoming Environmental Quality Act</u> , Art. 2	W.S. 35-11-201	Discharge or emission of air contaminants	Yes NA	Compliance with state air quality numeric and other substantive requirements identified as ARARs satisfies all requirements of this provision.
<u>Wyoming Environmental Quality Act</u> , Article 3	W.S. 35-11-301	Prohibits certain acts without a permit	Yes/NA	Although there is no federal counterpart which meets or exceeds the requirement that there be no threat to pollute the waters of the state, the selected remedy of a RCRA subtitle C landfill cap will comply with and meet the intent of this requirement for this interim action. The selected remedy will adequately reduce any threat to groundwater or surface water quality from migration of landfill contaminants resulting from infiltration or surface runoff of precipitation. Further, compliance with state water quality substantive requirements (permits are not required) identified as ARARs satisfies all requirements of this provision.
<u>Wyoming Environmental Quality Act</u> , Art. 4	W.S. 35-11-401(e)(iii)	Land Quality	No Yes	Relevant and appropriate only if soil is borrowed on-site to be used as capping materials. Quantities required make this unlikely.
<u>Wyoming Environmental Quality Act</u> , Art. 5	W.S. 35-11-509	Land ban on battery disposal	No Yes	
<u>Wyoming Air Quality Standards and Regulations</u>				
	Section 2	Definitions	Yes/NA	Definitions frequently action-based. Involved as needed to implement other WAQSR requirements.
	Section 13	Open Burning	No Yes	Interim action does not involve open burning. However may be applicable for flare treatment of landfill gases.
	Section 14	Control of Particulate Emissions	Yes/NA	Emissions from interim action will be subject to standards.

**Table A-4 - State Action-Specific ARARs
(Continued)**

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
	Section 15	Wood Waste Burners	No/No	Interim action does not involve wood waste burning.
	Section 16 (a), (c)	Odors	Yes/NA	Emissions from interim action will be subject to standards.
	Section 17	Motor Vehicle Pollution Control	Yes/NA	Motor vehicles used during interim action will be subject to standards.
	Section 18	Diluting and Concealing Emissions	Yes/NA	Emissions from interim action will be subject to standards.
	Section 19	Abnormal Conditions and Equipment Malfunctions	Yes/NA	Interim action will be subject to standards.
	Section 20	Air Pollution Emergency Episodes	Yes/NA	Interim action will be subject to standards.
	Section 21(c)(v) and (j)	Permit Requirements for Construction, Modification and Operations	Yes/NA	Although permits are not required, substantive requirements of BACT apply.
	Section 22	New Source Performance Standards	No/No	Proposed federal regulation at 40 CFR Part 60, Subpart WWW, will be considered if promulgated.
	Section 24	Prevention of Significant Deterioration	Yes/NA	Emissions from interim action will be subject to standards.
	Section 28	Visibility	Yes/NA	Emissions from interim action will be subject to standards. Applicable only if area of landfill redesignated as a Class I area.
<u>Wyoming Water Quality Rules and Regulations</u>				
	Chapter 1	Quality Standards for Wyoming Surface Waters	Yes/NA	Site runoff will be subject to substantive chemical-specific numeric standards for surface waters and discharges to surface waters, if more stringent than federal standards. Comments to W.S. 35-11-301 above apply to Chapter 1, section 1, prohibiting the threatening of violating a surface water quality standard.

**Table A-4 - State Action-Specific ARARs
(Continued)**

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
<u>Wyoming Solid Waste Management Rules and Regulations</u>	Chapter II	Discharges Permit Regulations for Wyoming	No/No	Although permits are not required, substantive requirements of other regulations must be met. Discharge standards may be used.
	Chapter III	Regulations for Permit to Construct, Install or Modify Public Water Supplies, Wastewater Facilities, and other Facilities Capable of Causing or Contributing to Pollution	Yes/NA	Although permits are not required, substantive requirements of regulation apply.
	Chapter IV	Regulations for Release of Oil and Hazardous Substances into Waters of the State of Wyoming	Yes/NA	Site runoff will be subject to requirements. Also applicable in the event fuels or other pollutants are released during construction.
	Chapter IX	Wyoming Groundwater Pollution Control Permit	No/No	Not required.
	Chapter XI, Section 31 and Part G	Design and Construction Standards for Sediment Control Facilities and Monitor Wells	Yes/NA	Substantive requirements of these regulations apply (permits are not required) if sediment control structures or monitor wells are constructed, or if existing monitor wells are abandoned.
	Chapter XVII	Underground Storage Tanks	No/No	See Record of Decision, Section 8.0.
	Chapter XVIII	General NPDES Permits	No/No	Although permits are not required, substantive requirements for storm water discharges must be met.
	Chapter I	General Provisions	No/No	Definitions action-based. Clarifies authority and jurisdictional issues. Involved as needed to implement other WSWMRR requirements.
	Chapter II	Sanitary Landfill Regulations	No/No	Landfill 6 does not fall under the definition of a municipal landfill.

**Table A-4 - State Action-Specific ARARs
(Continued)**

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
<u>Wyoming Hazardous Waste Management Rules and Regulations</u>	Chapter III	Industrial Landfill Regulations	No/No	Interim action qualifies as part of the process of closure, but selected remedy picks up RCRA subtitle C standards
	Chapter IV	Construction and Demolition Landfill Regulations	No/No	Interim action does not involve construction and demolition landfill activities.
	Chapter V	Landfarm Regulations (proposed)	No/No	Interim action does not involve landfarming.
	Chapter VI	Transfer, Treatment, Processing and Storage Facility Requirements	No/No	Interim action does not involve transfer, treatment, processing, or storage.
	Chapter VII	Financial Assurance Requirements	No/No	Not a substantive requirement
	Chapter VIII, Sections 3(b)(i) & (ii) and 4(c)(iii), (iv) & (v)	Special Waste Management Standards	Yes/NA	Substantive requirements within this regulation apply if landfill contains asbestos.
	Chapter XV, Sections 11(d)(1)(m), (p) & (q)	Wyoming Solid Waste Management Rules and Regulations, 1975	Yes/NA	Requirements more stringent than 40 CFR 264 apply.
	Chapter I	General Provisions	No/No	Definitions. Involved as needed to implement other substantive WHWMRR requirements more stringent than federal requirements.
	Chapter II	Rules and Regulations	No/No	Describes type of waste contained in landfill.
	Chapter X, Section 13(o)(vi)	Special Requirements for Liquids	Yes/NA	More stringent than 40 CFR 264.314 for placement of liquids in hazardous waste landfill.
<u>State Engineer's Office Rules and Regulations</u>	Part I	Permitting Requirements for Use of Wyoming Surface Waters	No/No	No use of surface waters is anticipated for interim action.

**Table A-4 - State Action-Specific ARARs
(Continued)**

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
	Part II	Permitting Requirements for Use of Groundwater in the State of Wyoming	Yes/NA	No use of ground water is anticipated for interim action, and no new monitoring wells are anticipated as part of this interim action, but substantive requirements of this regulation would apply although no permits are required.
<u>Wyoming Game and Fish Regulations</u>	W. S. 23-1-101	Wyoming Game and Fish Department Responsible for Wildlife Within the State of Wyoming	Yes/NA	Applicable in the event the interim action results in an impact wildlife, although this is not anticipated.
	Fish and Wildlife Coordination Act P.L. 85-624	Wyoming Game and Fish Department Coordination with Activities on Federal Land	No/No	In the event the interim action results in an unanticipated impact on wildlife, an administrative consultation requirement exists.

Table A-5 - Federal Location-Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; P.L., Public Law; Stat., Statute; Exec., Executive; DOT, Department of Transportation]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
<u>Archaeological and Historic Preservation Act</u>	16 USC 469 40 CFR 6.301(c)	Establish procedures to provide for preservation of historical and archaeological data which might be destroyed through alteration of terrain as a result of a Federal construction project or a Federally licensed activity or program	No/No	No historical or archeological data will be destroyed through interim action
<u>Archaeological Resources Protection Act (1979)</u>	93 Stat. 721 16 USC 470	This act requires a permit for any excavation or removal of archaeological resources from public or Indian land	No/No	No archeological objects will be excavated through interim action
<u>National Historic Preservation Act</u>	16 USC 470 40 CFR 6.301(a)-(c) 36 CFR Part 800 32 CFR 229	Require Federal agencies to take into account the effect of any Federally assisted undertaking or licensing on any district, site, building, structure, or object that is included in or eligible for the Register of Historic places	Yes/NA	F.E. Warren Air Force Base is on the National Register of Historic Places. Section 106 consultation will be performed.
<u>Historic Sites, Buildings, and Antiquities Act</u>	16 USC 461-467 40 CFR 6.301(a)	Require Federal agencies to consider the existence and location of landmarks on the National Registry of Natural Landmarks to avoid undesirable impacts on such landmarks	No/No	There are no items at the site listed in the NRNL
<u>Fish and Wildlife Coordination Act</u>	16 USC 1531-666 40 CFR 6.302(g)	Require consultation when Federal department or agency proposes or authorizes any modification of stream or other water body and adequate provision for protection of fish and wildlife resources	No/No	No modification to streams or water bodies is intended.
<u>Endangered Species Act</u>	16 USC 1531-1543 50 CFR Parts 17, 402 40 CFR 6.302(g) 50 CFR 222	Require that Federal agencies insure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify critical habitat	No/No	Interim action at the site will not impact any endangered species or critical habitat.

**Table A-5 - Federal Location-Specific ARARs
(Continued)**

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
<u>Executive Order on Floodplain Management</u>	Exec. Order No. 11,988 40 CFR 6.302(b) & Appendix A	Require Federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, the adverse impacts associated with direct and indirect development of a floodplain	No/No	Interim action at the site will not impact floodplain.
<u>Executive Order on Protection of Wetlands</u>	Exec. Order No. 11,990 40 CFR 6.302(a) & Appendix A	Require Federal agencies to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands if a practicable alternative exists	No/No	Interim action at the site will not result in destruction or loss of wetlands.
<u>Wild and Scenic Rivers Act</u>	16 USC 1271-1287 40 CFR 6.302(e)	Establish requirements applicable to water resource projects affecting wild, scenic, or recreational rivers within or involved in studies for inclusion in the National Wild and Scenic Rivers System	No/No	No water resource projects are planned as part of interim action.
<u>Miscellaneous</u>				
Impact on Wilderness Area	50 CFR 35.1	Establishes the National Wilderness Preservation System in order to preserve wilderness areas	No/No	There are no wilderness areas associated with the site.
Impact on Wildlife Refuges	50 CFR 27	Establishes restrictions on activities within a National Wildlife Refuge.	No/No	There are no wildlife refuges associated with the site.
Impacts on Coastal Zones	16 USC 1451-1464	Establishes prohibitions on federal agency activities inconsistent with a state's approved coastal zone management program	No/No	There are no coastal zones at the site

Table A-6 - State Location-Specific ARARs

[CFR, Code of Federal Regulations; P.L., Public Law; W.S., Wyoming Statute]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
<u>Environmental Quality Act</u>	Article 5, W.S. 35-11-501 to 35-11-514	Solid Waste Management	No/No	Location-specific requirements for siting landfills are administrative in nature and do not apply to an already sited landfill.
<u>Wyoming Water Quality Rules and Regulations</u>	Chapter I, Appendix A	Quality Standards for Wyoming Surface Waters	Yes/NA	Specifies surface water classifications for Crow Creek and Diamond Creek which determine standards for surface waters.
<u>State Engineer's Office Rules and Regulations</u>	Part I	Permitting Requirements for Use of Wyoming Surface Waters	No/No	No use of surface waters is anticipated for interim action.
	Part II	Permitting Requirements for Use of Groundwater in the State of Wyoming	Yes/NA	No use of ground water is anticipated for interim action. Permitting is not required, but substantive provisions would apply to ground water use.
	36 CFR 800	Procedures for Protection of Cultural Properties, State of Wyoming Archives, Museums and Historical Sites	No/No	Interim action will not cause loss of scientific or archaeological data.

Appendix B

**Temporarily Waived Federal and Wyoming State
Applicable, or Relevant and Appropriate Requirements (ARARs)**

Table B-1 - Federal Chemical-Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; Statute; Exec., Executive; DOT, Department of Transportation; FS, Feasibility Study]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
<u>Safe Drinking Water Act</u>	42 USC 300g			
National Primary Drinking-Water Regulations	40 CFR 141, Subparts B and G	Establish health based standards for the public water systems (maximum contaminant levels)	No/Yes	Groundwater is a potential or actual source of drinking water. This interim action is due to groundwater contamination. The cleanup of ground water will be addressed in subsequent actions.
National Secondary Drinking-Water Regulations	40 CFR 143.3	Establish welfare based standards for the public water systems (secondary maximum contaminant levels)	No/Yes	Groundwater is a potential or actual source of drinking water. This interim action is due to groundwater contamination. The cleanup of ground water will be addressed in subsequent actions.
Maximum Contaminant Level Goals (set at levels above zero)	40 CFR 141, Subpart F	Establish non-enforceable drinking water quality goals set at levels of no known or anticipated adverse health effects, with an adequate margin of safety	No/Yes	Groundwater is a potential or actual source of drinking water. This interim action is due to groundwater contamination. The cleanup of ground water will be addressed in subsequent actions. Relevant and appropriate only for constituents of concern with an MCLG greater than zero.
<u>Clean Water Act</u>	33 USC 1251-1376			
Water Quality Criteria	40 CFR 131	Set criteria for water quality based on toxicity to aquatic organisms and human health	No/Yes	Groundwater is a potential or actual source of drinking water. This interim action is due to groundwater contamination. The cleanup of ground water will be addressed in subsequent actions.
<u>Resource Conservation and Recovery Act</u>				
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities: Releases from Solid Waste Management Units	40 CFR 264 Subpart F, Section 264.94	Establishes concentration limits for hazardous constituents in the ground water	Yes/NA	Groundwater is a potential or actual source of drinking water. This interim action is due to groundwater contamination. The cleanup of ground water will be addressed in subsequent actions.

Table B-2 - State Chemical-Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; Statute; Exec., Executive; DOT, Department of Transportation; FS, Feasibility Study]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
<u>Wyoming Water Quality Rules and Regulations</u>				
	Chapter VIII	Quality Standards for Wyoming Groundwaters	Yes/NA	Groundwater is a potential or actual source of drinking water. This interim action is due to groundwater contamination. The cleanup of ground water will be addressed in subsequent actions. Regarding Section I, compliance with other state water quality substantive requirements (permits are not required) identified as ARARs satisfies all requirements of this provision.
	Chapter XVII, Appendix A, Sections III and IX	Underground Storage Tanks	No/Yes	Groundwater is a potential or actual source of drinking water. This interim action is due to groundwater contamination. The cleanup of ground water will be addressed in subsequent actions. Drinking Water Equivalent Levels (DWELs) established in Section IX are relevant and appropriate only if federal MCLs do not exist. Potential or actual relevance and appropriateness of these DWELs does not invoke any soil cleanup or soil contamination concentration standard requirements of Chapter XVII for soils located within the landfill boundaries which are capped.
<u>Wyoming Hazardous Waste Rules and Regulations</u>	Chapter X, Sections 6(c) - 6(g)	Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities	Yes/NA	Groundwater is a potential or actual source of drinking water. This interim action is due to groundwater contamination. The cleanup of ground water will be addressed in subsequent actions. Substantive groundwater protection standards and concentration limits that are more stringent than federal requirements for some contaminants apply.

Table B-3 - State Action-Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; Statute; Exec., Executive; DOT, Department of Transportation; FS, Feasibility Study]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
<u>Wyoming Water Quality Rules and Regulations</u>	Chapter VIII	Quality Standards for Wyoming Groundwaters	Yes/NA	Groundwater is a potential or actual source of drinking water. This interim action is due to groundwater contamination. The cleanup of ground water will be addressed in subsequent actions. Regarding Section 1, compliance with other state water quality substantive requirements (permits are not required) identified as ARARs satisfies all requirements of this provision.

