

## 2.13 Statutory Determinations

Under CERCLA Section 121 (as required by NCP Section 300.430(f)(5)(ii)), the lead agency must select remedies that are protective of human health and the environment, comply with ARARs, are cost-effective, and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, periodic Five-year Reviews are required if after the remedy, hazardous substances will remain in place above levels allowing for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure. CERCLA also includes (1) a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element; and (2) a bias against offsite disposal of untreated wastes.

The following subsections discuss how the selected remedies meet these statutory requirements.

### 2.13.1 Protection of Human Health and the Environment

This section discusses how the selected remedies will adequately protect human health and the environment through treatment and/or LUCs:

- **Alternative 1 – No Further Action:** The selected remedy at Site SS041 will protect human health and the environment because no COCs are currently found in the groundwater at concentrations equal to or greater than cleanup levels.
- **Alternative 2 – MNA:** The selected remedy at Sites FT004 and LF006, Subareas LF007B and LF007D, and Sites LF008, ST027B, SD031, SD033, and SD043 will protect human health and the environment by using the physical, chemical, and biological processes of natural attenuation. LUCs will be implemented until groundwater COC concentrations are at such levels to allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure. LUCs will also be implemented to restrict residential and industrial land uses until concentrations of volatile COCs in groundwater posing a potential indoor air risk are at such levels that VOCs emanating from groundwater to indoor air do not pose unacceptable risk to human health.
- **Alternative 3 – GET:** The selected remedy at Site FT005, Subarea LF007C, and Sites SS029 and SS030 will protect human health and the environment by physically removing groundwater contaminants using extraction wells and on-base treatment of contaminated groundwater using carbon adsorption. The alternative will operate and LUCs will be implemented until groundwater COC concentrations are at such levels to allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure. LUCs will also be implemented to restrict residential and industrial land uses until concentrations of volatile COCs in groundwater posing a potential indoor air risk are at such levels that VOCs emanating from groundwater to indoor air do not pose unacceptable risk to human health. LUCs that restrict access to groundwater include the groundwater

underlying off-base easements at Site FT005, Subarea LF007C, and Site SS030 purchased by the AF from private landowners. These easements contain legal restrictions preventing the landowners from engaging in water development or soil disturbing activities that could interfere with cleanup activities.

- **Alternative 4 – Bioreactor and GET:** The selected remedy at Site SS016 will protect human health and the environment by using in situ ERD treatment of the principal threat wastes within the portions of the plume with the highest contaminant concentrations (via a bioreactor) in combination with GET in the distal portions of the plume. The alternative will operate and LUCs will be implemented until groundwater COC concentrations are at such levels to allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure. LUCs will also be implemented to restrict residential and industrial land uses until concentrations of volatile COCs in groundwater posing a potential indoor air risk are at such levels that VOCs emanating from groundwater to indoor air do not pose unacceptable risk to human health.
- **Alternative 5 – EVO and EA:** The selected remedy at Sites SS015, SD036, and SD037 will protect human health and the environment by using in situ ERD treatment of the principal threat wastes within the portions of the plumes with the highest concentrations of contaminants (via EVO injection) in combination with the processes of natural attenuation in the distal portions of the plumes. The alternative will operate and LUCs will be implemented until groundwater COC concentrations are at such levels to allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure. LUCs will also be implemented to restrict residential and industrial land uses until concentrations of volatile COCs in groundwater posing a potential indoor air risk are at such levels that VOCs emanating from groundwater to indoor air do not pose unacceptable risk to human health.
- **Alternative 6 – Bioreactor, Phytoremediation, EVO PRB, and EA:** The selected remedy at Site DP039 will protect human health and the environment by using in situ ERD treatment (via bioreactor and EVO PRB) and in situ biological treatment (phytoremediation) of the principal threat wastes within the portions of the plumes with the highest concentrations of contaminants in combination with the processes of natural attenuation in the distal portions of the plume. The alternative will operate and LUCs will be implemented until groundwater COC concentrations are at such levels to allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure. LUCs will also be implemented to restrict residential and industrial land uses until concentrations of volatile COCs in groundwater posing a potential indoor air risk are at such levels that VOCs emanating from groundwater to indoor air do not pose unacceptable risk to human health.
- **Alternative 7 – Passive Skimming and EA:** The selected remedy at Site SD034 will protect human health and the environment by combining the physical removal of Stoddard solvent free product, containing dissolved COCs, to address the principal threat waste and the processes of natural attenuation to address the lower

concentrations of COCs in the distal portions of the plume. The alternative will operate and LUCs will be implemented until groundwater COC concentrations are at such levels to allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure. Stoddard solvent will be removed to a thickness of 0.01 foot, or to the maximum extent practicable, in a manner that minimizes the migration of COCs into previously uncontaminated groundwater.

Performance monitoring of the alternatives will be conducted under the Travis AFB GRIP. The results of the monitoring will be provided to the regulatory agencies in monthly status updates and in annual GRISRs. Similarly, the status of LUCs will be provided in annual LUC reports. The next Five-year Review of remedial systems at Travis AFB is scheduled for 2018.

### **2.13.2 Compliance with ARARs**

Remedial actions must comply with both federal and state ARARs. ARARs include substantive provisions of any promulgated federal or more stringent state environmental standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate for a CERCLA site or action.

ARARs fall into three (3) categories: chemical-specific, location-specific, and action-specific. Chemical-specific ARARs are health-based or risk-management-based numbers that provide concentration limits for the occurrence of a chemical in the environment at agreed-upon points of compliance. Location-specific ARARs restrict activities in certain sensitive environments. Action-specific ARARs are activity-based or technology-based, and typically control remedial activities that generate hazardous wastes (such as with those covered under RCRA). Materials “to be considered” (TBC) are non-promulgated advisories, guidance, or proposed standards issued by federal or state government that are not legally binding, but that may provide useful information or recommended procedures. These materials are not potential ARARs, but are evaluated for each Superfund site in developing potential performance standards for the CERCLA remedy as deemed appropriate by the lead agency.

Appendix C summarizes the chemical-specific, location-specific, and action-specific ARARs and TBCs for the selected remedies at Travis AFB and describes how the selected remedies address each one (1) at agreed-upon points of compliance. Once a TBC is selected in a Record of Decision as a requirement, it becomes a binding performance standard with which the chosen remedy must comply.

### **2.13.3 Cost Effectiveness**

The selected remedies represent the most reasonable value for the money, and costs are proportional to the effectiveness of the remedies by achieving long-term effectiveness and permanence within a reasonable time. Minimizing the need for additional infrastructure, equipment, O&M, or studies and maximizing the continued operation of existing IRAs results in value and cost savings.

In the AF's judgment and as described in Section 2.10, more rapid cleanup of groundwater to levels allowing for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure would not be technically feasible or cost effective. Sites LF008, SS015, SS016, SD034, SD036, SD037, and DP039 have longer remediation timeframes associated with each of the alternatives evaluated for these sites. At Site LF008, COCs are not dissolved in groundwater but rather sorbed to the fine soil particles suspended in the groundwater; therefore, estimates of the time to achieve cleanup levels for both alternatives evaluated are from 100 to greater than 100 years.

At Sites SS015, SS016, SD036, SD037, and DP039, high concentrations of COCs (indicative of DNAPL) remain even after more than a decade of interim remediation. Estimates of the time to achieve cleanup levels are greater than approximately 60 years even using treatment included in the selected remedies. Expanding the scope of treatment areas under these alternatives would be required to potentially reduce the time to achieve cleanup levels and is not considered technically feasible based on the presence of a large volume of contaminated groundwater. At Site SS016, it is also not considered technically feasible to expand the treatment areas beneath airfield infrastructure, such as parking ramps, taxiways, and runways. The required expansion of groundwater treatment systems in the vicinity of aircraft hangars, fuel hydrant systems, and other supporting airfield infrastructure would be difficult or impossible, depending on the nature of the industrial activities and the restrictions associated with them (CH2M HILL, 2012h).

#### **2.13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies**

The selected remedies include permanent solutions and represent the maximum extent to which treatment is practicable at each site. The selected remedies have the potential to provide long-term and permanent remedies that will meet cleanup levels and include LUCs to limit direct contact until they are met. The selected remedies are also expected to effectively treat COCs in groundwater. The selected remedies include treatment of groundwater with the highest concentrations of COCs, potentially reducing the toxicity and volume of COCs in groundwater. They also provide monitoring and evaluation to confirm reductions in COC mass and concentrations and confirm whether the plume is mobile, stable, or receding. Because long-term effectiveness and permanence and reduced toxicity and volume are achieved through the selected remedies, they provide the best balance of tradeoffs in terms of the balancing criteria.

#### **2.13.5 Preference for Treatment as a Principal Element**

The NCP establishes the expectation that treatment will be used to address the principal threats posed by a site wherever practicable (40 CFR 300.430[a][1][iii][A]). The selected remedies for Site FT005, Subarea LF007C, and Sites SS029 and SS030 (Alternative 3 – GET) use onsite treatment of groundwater extracted from plumes with low-level threat wastes. The selected remedies for Site SS016 (Alternative 4 – EVO and GET); Sites SS015, SD036, and SD037 (Alternative 5 – EVO and EA); and Site DP039 (Alternative 6 – Bioreactor, Phytoremediation, EVO PRB, and EA) are focused on treatment of the principal threat wastes and the highest concentration portions of these site plumes. Treatment of these principal threat wastes and the highest concentrations of contaminated groundwater thereby satisfy the statutory preference for treatment as a principal element of the remedies. More complete

summaries of the use of treatment to satisfy the statutory preference are provided in the following list:

- The selected remedies for Site FT005, Subarea LF007C, and Sites SS029 and SS030 (Alternative 3 – GET) satisfy the statutory preference for treatment as a principal element of the remedy through off-base destructive treatment of contaminant-laden LGAC by an EPA-approved vendor. This treatment will permanently and significantly reduce the volume and toxicity of groundwater contaminants extracted from plumes with low-level threat wastes.
- At Site SS016 (Alternative 4 – Bioreactor and GET), in situ ERD treatment of the highest concentration portion of the plume with a bioreactor satisfies the statutory preference for treatment as a principal element of the remedy at this site. Residual DNAPL likely exists at the site and constitutes the principal threat waste. The remedy will treat contaminants via ERD processes as they dissolve into the groundwater from the DNAPL source material. The ERD treatment processes will permanently and significantly reduce the volume and toxicity of the principal threat wastes and the highest concentrations of contaminants dissolved in groundwater. Offbase destructive treatment of contaminant-laden LGAC by an EPA-approved vendor also satisfies the statutory preference for treatment as a principal element of the remedy at this site.
- At Sites SS015, SD036, and SD037 (Alternative 5 – EVO and EA), in situ ERD treatment of the highest concentration portions of the plume using EVO injection satisfies the statutory preference for treatment as a principal element of the remedies at these sites. Residual DNAPL likely exists at these sites and constitutes the principal threat wastes. The remedy will treat contaminants via ERD processes as they dissolve into the groundwater from the DNAPL source material. The ERD treatment processes will thereby permanently and significantly reduce the volume and toxicity of the principal threat wastes and the highest concentrations of contaminants dissolved in groundwater.
- In situ treatment of the highest concentration portions of the Site DP039 plume using the combination of a bioreactor, phytoremediation, and EVO PRB satisfies the statutory preference for treatment as a principal element of the remedy at this site. Residual DNAPL likely exists at the site and constitutes the principal threat waste. The remedy will treat contaminants via ERD (bioreactor and EVO PRB) and biological (phytoremediation) processes as they dissolve into the groundwater from the DNAPL source material. The ERD and biological treatment processes will thereby permanently and significantly reduce the volume and toxicity of the principal threat wastes and the highest concentrations of contaminants dissolved in groundwater.

At Site SD034, Alternative 7 – Passive Skimming and EA satisfies the statutory preference for treatment as a principal element of the remedy. Residual Stoddard solvent (LNAPL containing dissolved COCs) exists at the site and constitutes the principal threat waste that poses an ongoing source of groundwater contamination. The remedy will entail the physical removal of free-phase Stoddard solvent by passive skimming followed by off-base recycling by an EPA-approved vendor. Although the selected remedies for Site SS041 (Alternative 1 – No Further Action) and Sites FT004 and LF006, Subareas LF007B and LF007D, and Sites LF008, ST027B, SD031, SD033, and SD043 (Alternative 2 – MNA) do not strictly satisfy

the statutory preference for treatment, the immediate need for further active remediation at these sites is not warranted for the following reasons:

- **Site SS041**
  - COCs in groundwater were removed as a part of an interim action (GET system consisting of ex situ treatment of extracted groundwater with UV/Ox and carbon adsorption) performed from 1999 to 2005, and cleanup levels were achieved by the interim action.
- **Sites FT004 and LF006, Subareas LF007B and LF007D, and Sites LF008, ST027B, SD031, SD033, and SD043**
  - MNA was successfully demonstrated by long-term interim MNA assessments (CH2M HILL, 2010b), results of contaminant rebound studies (CH2M HILL, 2012d), and results of an aerobic chlorinated cometabolism enzyme study (CH2M HILL, 2012b) (refer to Section 2.2.5).
  - MNA assessment data demonstrated that concentrations of COCs in groundwater have significantly declined at Sites FT004, LF006, and SD031. Natural attenuation processes at Subarea LF007B have reduced COC concentrations to less than cleanup levels. At Subarea LF007D, the concentrations of COCs remained stable over approximately a decade of MNA assessment, but the plume is small (limited to the vicinity of one [1] well) and is not migrating (CH2M HILL, 2010b).
  - In 2010, the GET systems at Sites FT004, LF008, SD031, SD033, and SD043 were shut down as part of a contaminant rebound study. The concentrations of COCs have not increased in the absence of active GET, providing additional support for selection of the MNA remedy (CH2M HILL, 2012d).
  - There is no evidence from the existing monitoring network that COCs in groundwater are migrating beyond current site boundaries (CH2M HILL, 2010b).
  - The downgradient extent of the Site ST027B groundwater plume is approximately 3,200 feet from the Base boundary. The plume is stable and not migrating.
  - The interim GET systems at Sites FT004, LF008, SD031, and SD043 had become increasingly less cost-effective over approximately a decade of operation. At Sites FT004, SD031, SD033, and SD043, the GET systems reduced COC concentrations and the extent of contamination, but the unit cost of COC removal was high and increasing. At Site LF008, COC concentrations remained stable over approximately a decade of GET system operation.
  - Groundwater at Travis AFB is of low quality and not currently used for any domestic or industrial purposes. No drinking water wells are, or are projected to be, threatened.
  - LUCs will be maintained on these sites to prevent access or use of groundwater, including development of water wells, to restrict soil excavation and other subsurface work, to maintain the integrity of current and future remedial and monitoring systems, and to restrict land use to industrial purposes only until the

concentrations of COCs in the groundwater are at such levels to allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure. LUCs will also be maintained to restrict residential and commercial land uses until concentrations of volatile COCs in groundwater posing a potential indoor air risk are at such levels that VOCs emanating from groundwater to indoor air do not pose unacceptable risk to human health.

### **2.13.6 Five-year Review Requirements**

Because the selected remedies result in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure for more than 5 years from initiation of the remedies, a protectiveness review will be conducted within 5 years after initiation of remedial actions to verify that the remedies are, or will be, protective of human health and the environment.

The ROD signature date signifies the initiation of remedial action and the end of the period of interim remediation being conducted under the final NEWIOU Groundwater IROD (Travis AFB, 1998) and final WABOU Groundwater IROD (Travis AFB, 1999).

Five-year reviews will be conducted until concentrations of hazardous substances, pollutants, or contaminants remaining onsite are reduced to levels that allow for designated beneficial uses of groundwater (domestic, municipal, agricultural, and industrial supply) as well as unlimited use and unrestricted exposure and until concentrations of volatile COCs in groundwater posing a potential indoor air risk are at such levels that VOCs emanating from groundwater to indoor air do not pose unacceptable risk to human health. The next Five-year Review of remedial systems at Travis AFB is scheduled for 2018. The last Five-year Review was finalized in 2013 (Endpoint, 2013).

## 2.14 Documentation of Significant Changes

No significant changes were made to the selected remedies as originally identified in the Proposed Plan. COCs identified in the Proposed Plan, but not included in the ROD, are nickel and bis(2-ethylhexyl)phthalate. The rationale for their exclusion as COCs is provided in the following list:

- In 2002, nickel was demonstrated to be leaching from the stainless steel well casings used in some monitoring well construction and not representative of groundwater contamination.
- Also in 2002, bis(2-ethylhexyl)phthalate was recognized as a field and/or laboratory artifact and also not representative of groundwater contamination.
- Cleanup levels for aldrin, acetone, naphthalene, and chloromethane were described in the FFS and Proposed Plan as MCLs; they are actually EPA RSLs, since none of these compounds have a State of California or federal primary MCL.

Also, RAOs for Environmental Protection are listed in the Proposed Plan, but not in Section 2.8, because no ecological risks for groundwater are identified in this ROD.