

With the help of Congress and our communities, we are driving the Air Force environmental cleanup program to completion. Stable funding from Congress continues to provide us the ability to manage our cleanup program within budget. Dialogue with our stakeholders, informed by sound science, allows us to reach community-based solutions that are beneficial to the environment, and to our neighbors. Our cleanup program showcases the three principles of Air Force environmental programs — Sustaining Readiness, Being a Good Neighbor, and Leveraging Resources.

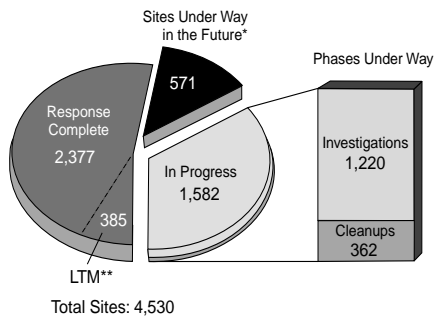


Thomas W.L. (Tad) McCall,
Deputy Assistant Secretary of
the Air Force (ESOH)

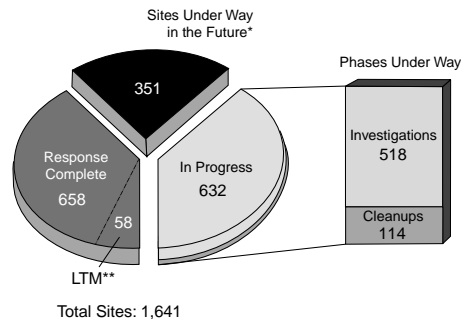
Restoration Status and Progress

In FY99, the Air Force continued to make substantial progress toward completion of its restoration program and reducing risk to human health and the environment. Strong stakeholder involvement, stable funding, and the application of relative risk “plus” factors continue to be used successfully to sequence site and installation environmental restoration activities.

**Active Site Status
as of September 30, 1999**




**BRAC Site Status
as of September 30, 1999**




*Includes sites with future Preliminary Assessment starts planned and cleanup sites that are between phases.

**LTM is a subset of Response Complete.

In FY99...

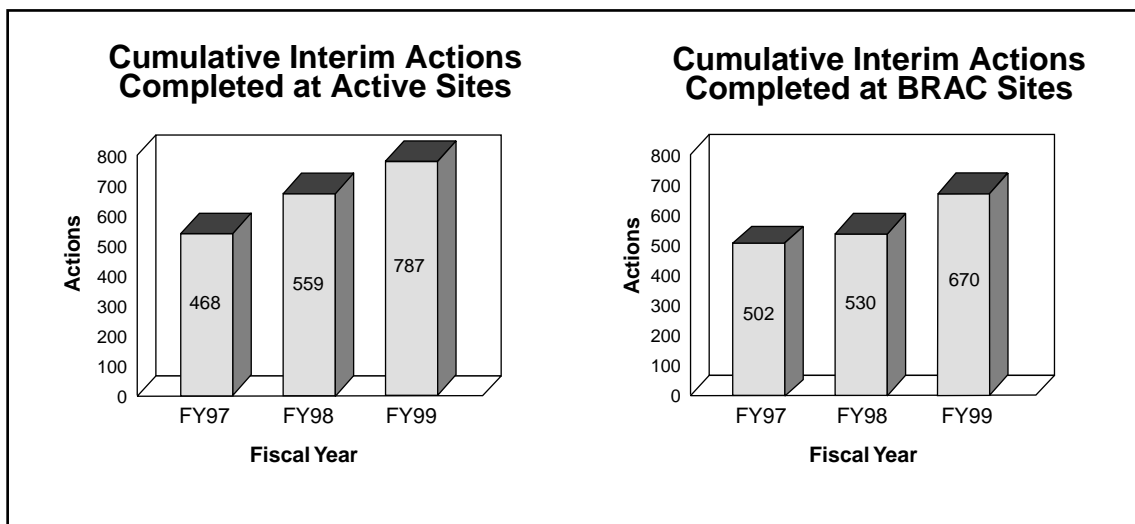
- In FY99, the active Air Force added 36 new sites to its restoration inventory, bringing the Air Force active-installation site total to 4,530.
 - Air Force Base Realignment and Closure (BRAC) added 97 new sites to its restoration inventory, bringing the BRAC site total to 1,641 at 30 installations.
 - 200 BRAC sites achieved Response Complete (RC) status.
 - 140 interim actions were completed at BRAC sites.
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Through FY99...

- 2,377 active-installation sites require no further action except Long-term Monitoring (LTM); 2,153 active-installation sites are either in progress or have future restoration actions planned.
 - Of the sites in progress, 1,220 have investigations under way and 839 have cleanup actions in progress.
 - 198 active-installation sites require long-term operations.
 - 658 of the 1,641 BRAC sites have achieved RC status. These sites require no further action other than LTM at many of the sites.
 - 518 BRAC sites are in investigation or awaiting the development or signing of appropriate decision documents; cleanup activities are under way at 465 BRAC sites.
 - Overall, Air Force BRAC has completed 670 interim actions at 542 sites; more than 400 interim actions are under way at BRAC sites.
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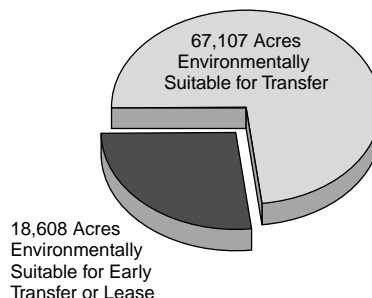
Program Execution

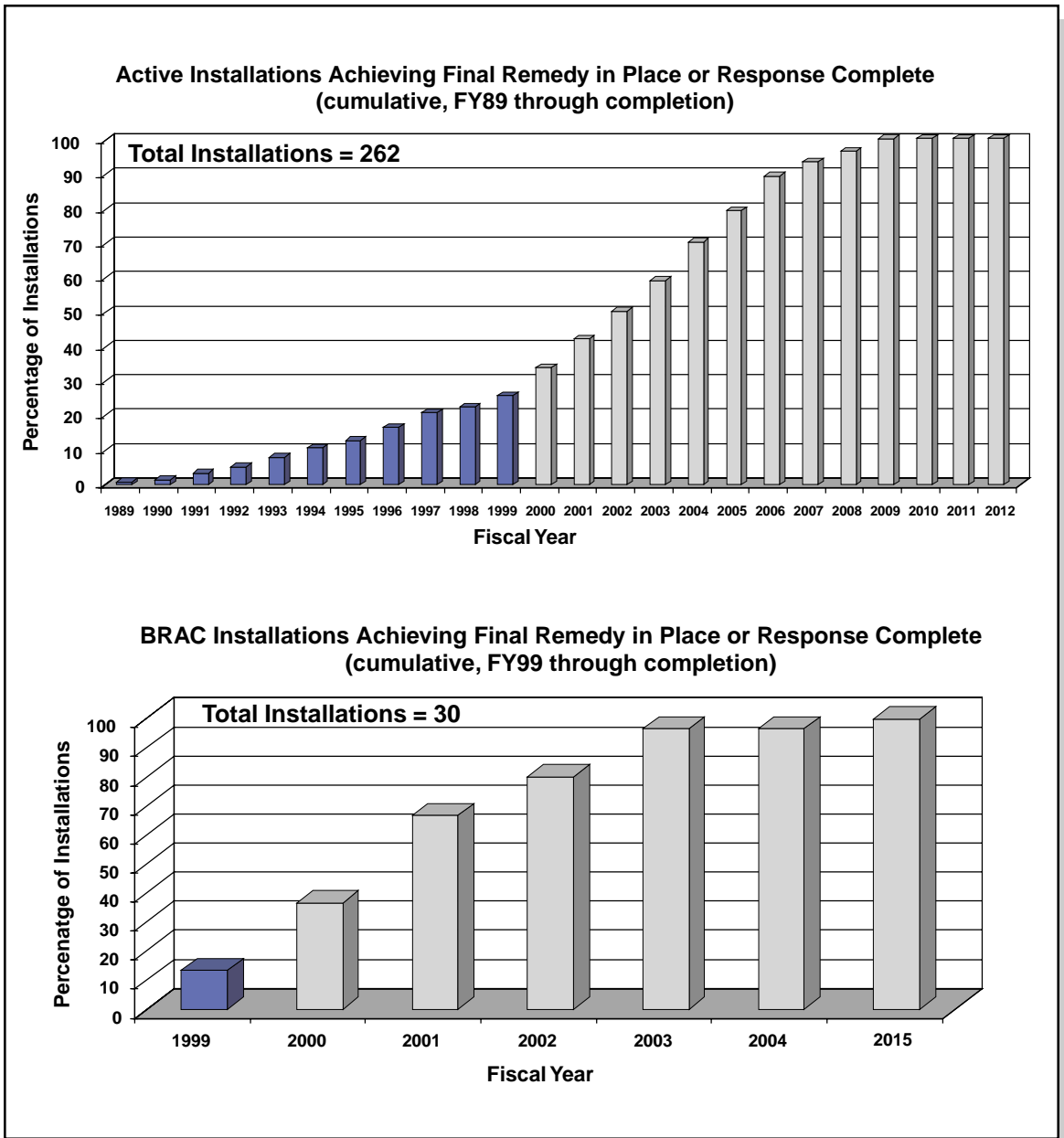
The Air Force now has 4,530 active-installation sites and 1,641 BRAC sites. Of these, 2,377 active sites and 658 BRAC sites require no further action except, in some cases, LTM. In FY99, four BRAC installations — Bergstrom, Eaker, Reese, and Roslyn — achieved last-remedial-action-in-place status. At the end of FY99, 85,714 acres at Air Force BRAC installations was identified for transfer out of DoD control. Approximately 80 percent of this property was suitable for transfer at the end of the fiscal year. Most of the property that is not suitable for transfer contains groundwater contamination. For most of these sites, the required remedial systems have been put in place or are planned. Operating Properly and Successfully determinations for these systems will be required before the property will be suitable for transfer.

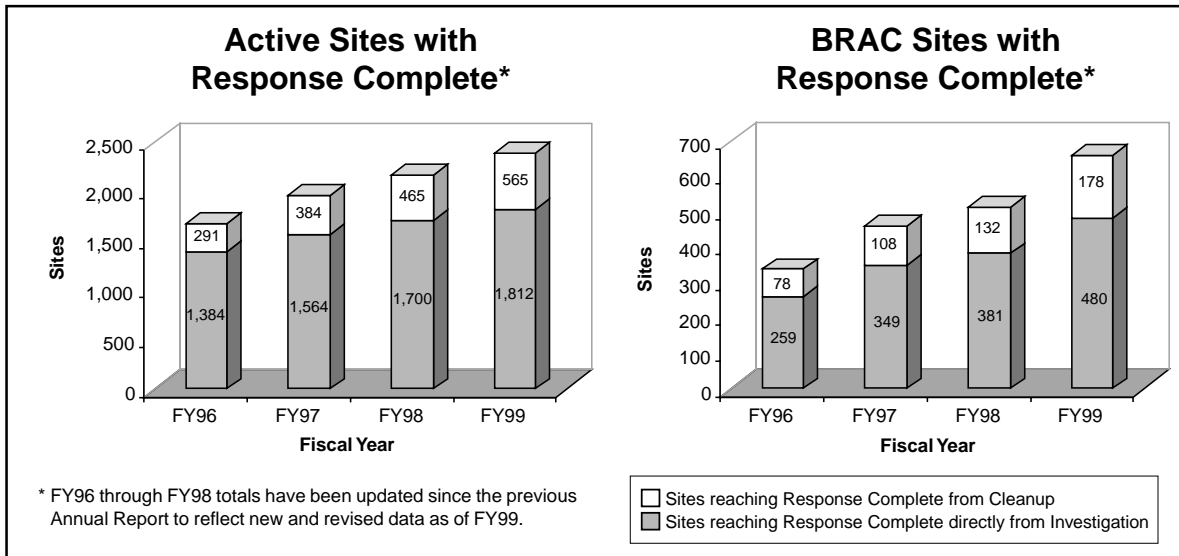


In FY99, Air Force added 36 new active-installation sites and 97 new BRAC sites. The BRAC sites include 20 sites at Gentile Air Force Station (also know as Dayton Defense Electronic Supply Center). Air Force BRAC assumed responsibility for this installation beginning in FY99. Two of the Air Force's 32 BRAC installations do not have any BRAC restoration sites.

Environmental Condition of BRAC Property







Program Accomplishments

During FY99, the Air Force focused on enhancing stakeholder knowledge and involvement and improving program consistency to overcome some of the impediments it faced in achieving its restoration goals. To begin this process, the Air Force conducted regulator partnering meetings with all 10 U.S. EPA Regions and 50 states. The primary goal of these meetings was to optimize Air Force and regulator environmental performance through enhanced upper-level management communication and coordination. The meetings were successful, and the Air Force believes this continued focus on regulatory involvement in planning and scheduling environmental restoration activities will lead to greater program efficiency and continue to improve the consistency and accuracy of our projected schedule.

In FY99, Air Force BRAC developed and began implementing an institutional control and land use control (IC/LUC) management strategy. This strategy addresses how the Air Force will implement, monitor, and enforce LUCs and ICs related to environmental restoration activities at its closing or realigning installations. In this strategy, land use control is an overarching term that encompasses —

- Institutional controls
- Land use restrictions
- Site controls.

Air Force

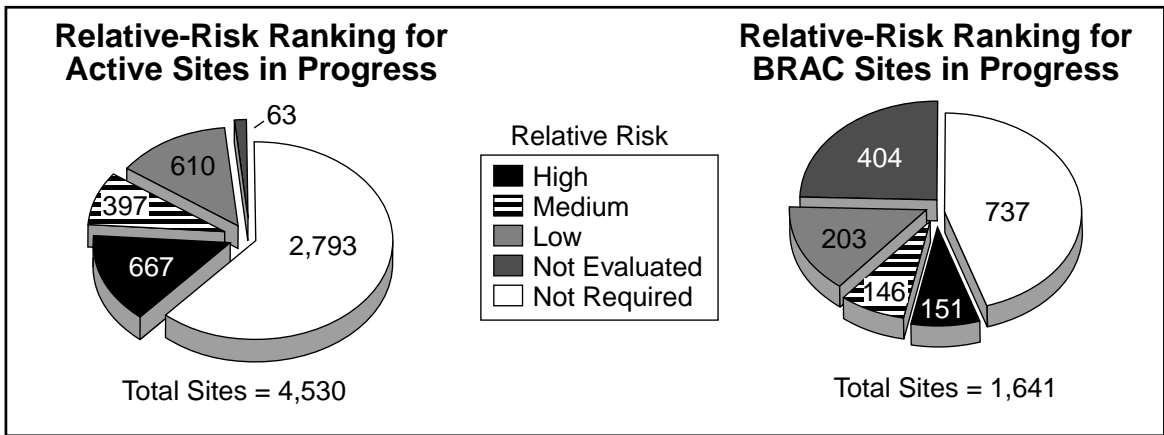
LUC essentially means any type of physical, legal, or administrative mechanism that restricts the use of, and limits access to, real property to prevent exposure to hazardous substances above permissible levels. These controls are intended both to protect the integrity of the engineering remedy (if present) and to limit individuals' exposure to hazards by restricting land use. Air Force BRAC is now preparing an IC/LUC layering strategy at affected installations.

Leading the Way: Air Force Receives U.S. EPA Award

Air Force BRAC received the U.S. Environmental Protection Agency Bronze Medal for leading the effort to develop *The Environmental Site Closeout Process Guide*. This guide consolidates the existing statutory and regulatory requirements affecting the closeout of sites under the Defense Environmental Restoration Program. DoD expects to release the guide in FY00. Air Force BRAC led a DoD-U.S. EPA-state working group in developing the document. The guide breaks new ground by defining the work to be done at sites after a remedial action decision is made — the point at which most cleanup guidance has traditionally ended.

Individual installations also achieved notable progress during FY99. For example:

- Air Force environmental restoration staff in Alaska collected thousands of drums and properly disposed of waste they encountered at Galena Air Force Base. Community-based contracting resulted in use of local resources and effective and consistent stakeholder (state, municipal government, tribe, and native council) buy-in and involvement.



Breaking New Ground at Davis-Monthan Air Force Base

Through innovation and teamwork, the restoration staff at Davis-Monthan completed a major project in record time without interrupting the base's flying mission.

This project involved the base's control tower, which had been constructed over an abandoned landfill. Investigation revealed that methane gas from decaying waste in the landfill was filtering into the control tower. The earthwork around the control tower, which was needed to address this problem, necessitated a complete control tower shutdown for 90 days. However, the base achieved its goal of cleaning up the environment and protecting the health and safety of citizens while continuing to fulfill its operational commitments.

- The Air Force's continued relationship with the Oglala Sioux Tribe near Ellsworth Air Force Base provided a highlight of our FY99 program. The base helped establish the first Native American restoration advisory board (RAB) at Ellsworth. This board helped in investigating and cleaning up the Air Force portion of the former Badlands Bombing Range and in maintaining environmental and public partnership efforts until the remaining land can be returned to the tribe. In recognition of the base's efforts, the tribe presented Ellsworth with a quilt (which is comparable to a presidential or congressional citation).
- In FY99, Reese Air Force Base completed investigations and remedial action construction at all of its restoration sites — less than 2 years after the base's closure in FY97. Restoration sites at the base included a large solvent plume that extended more than 2 miles off the base; a smaller solvent plume whose source was a landfill; and other sites, such as fire training areas, firing ranges, and landfills. The Reese BRAC Cleanup Team (BCT), which includes representatives from the Texas Natural Resource Conservation Commission and U.S. EPA Region 6, established a good working relationship, built on trust and cooperation. This relationship allowed the team to effectively accelerate the environmental restoration program. The BCT also used a password-protected Web site to exchange information, reducing review times by up to 65 percent.

Management Initiatives

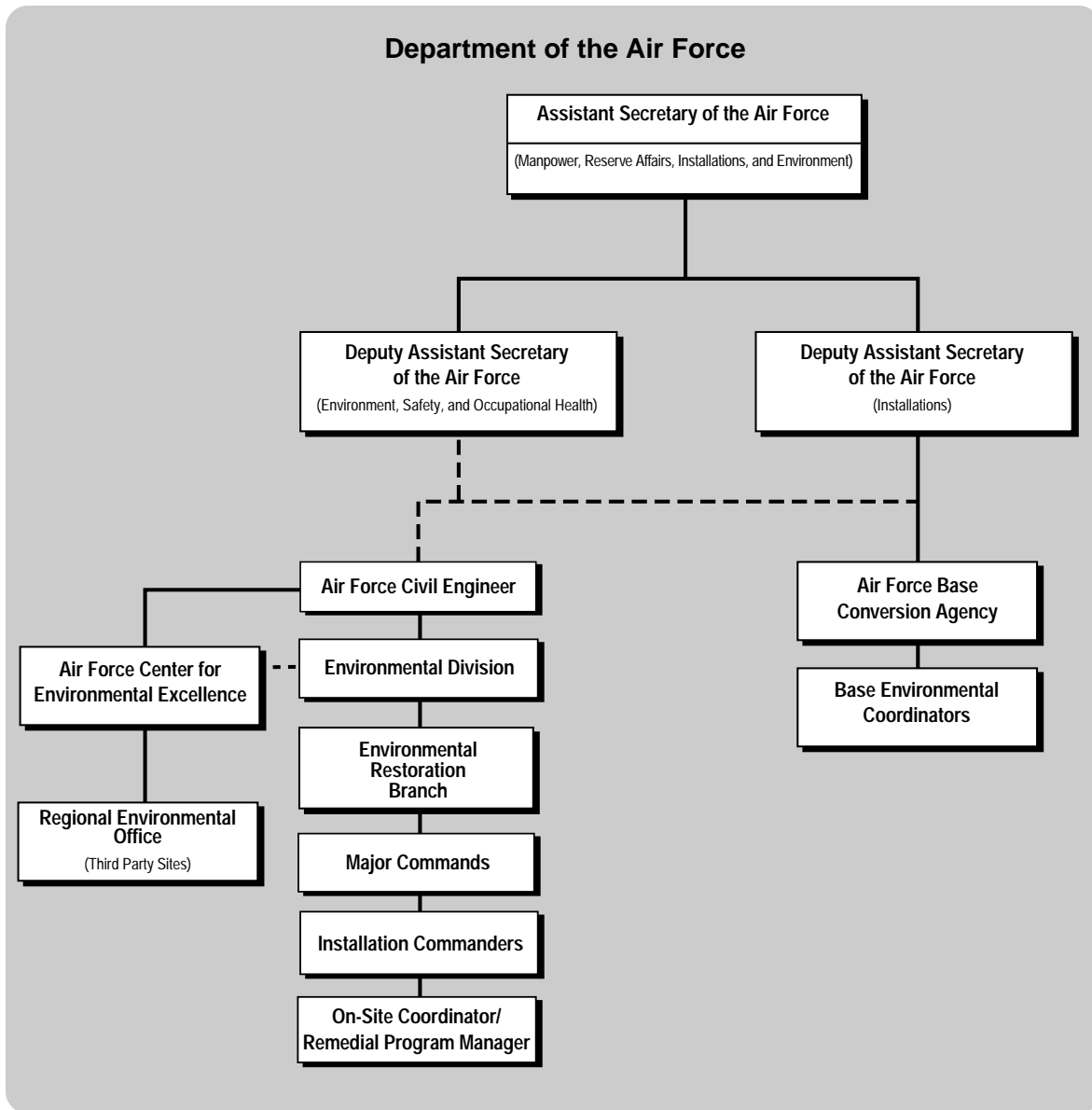
Another Air Force achievement in FY99 was the launching of a development effort for a comprehensive environmental restoration cost-to-complete (CTC) standard for Air Force-wide application. This effort will identify and recommend an approach for accomplishing DoD and Air Force CTC objectives and specific tools to meet data collection needs. The tools identified in this effort will focus on such aspects as —

- Data collection for recording and archiving cost estimates and justifications
- Justifications for changes in cost estimates
- Integration of the CTC deliverables into the information management system.

Also in FY99, the Air Force implemented new initiatives for its information management systems. These systems are designed to enhance the visibility of Air Force restoration program information at all levels, while reducing the data collection burden. In the past year, automated metrics were added to graphically display active-installation site and installation completion information in the database. Air Force BRAC has further defined its reporting system and implemented site closeout guidance.

Showcasing Remedial System Performance

The Air Force Base Conversion Agency co-sponsored, with the U.S. EPA's Technology Innovation Office and the Federal Remediation Technologies Roundtable, a conference on improving LTM and remedial system performance. This conference, held in St. Louis, Missouri, in June 1999, was designed to provide up-to-date information on LTM and system optimization through a combination of presentations and topical workshops. The conference stemmed from a need to evaluate and assess the processes and practices for monitoring and optimizing subsurface remedy performance and associated contaminant changes. The objectives of the conference were to highlight successes and issues related to improving the performance of subsurface remediation technologies, to showcase practical approaches to cost-effective monitoring of remedial performance, and to identify research gaps and needs based on current practice. A conference summary is available at <http://www.frtr.gov/optimization/optimize.html>.



Air Force is developing a protocol to streamline low-cost, risk-based closure of petroleum-contaminated sites. This initiative is under way at nine small Air Force petroleum-contaminated sites in the southern and southeastern United States. The project is demonstrating that a streamlined approach can be used to achieve site closure for less than \$50,000.

Innovative Technologies and Technology Transfer

A cornerstone of the Air Force environmental restoration strategy is the development and use of innovative technologies and system decision tools. Successful execution of this strategy has accelerated progress toward program goals. Recent successes include:

- A planned \$3 million soil vapor extraction system at Davis-Monthan Air Force Base was halted in the design phase when Air Force remedial project managers recognized the opportunity to apply an innovative technology. As a result, the system was modified through use of an internal combustion engine off-gas treatment system. This innovation decreased project costs to \$222,000, and site closure is now imminent.
- Technology transfer program managers have recently achieved risk-based site closures in which natural attenuation processes were combined with mechanical remediation systems to mitigate risk at greatly reduced costs. In FY99, such closures occurred at Eielson, Ellsworth, Elmendorf, Malmstrom, Wurtsmith, England, Kelly, Keesler, Eglin, Tyndall, and Randolph Air Force Bases.

Another decision tool, the Remedial Process Optimization (RPO) initiative, has recently proved its effectiveness at several test bases. The RPO process, an innovative refinement of the peer review and the 5-year review process, provides Air Force expert technical assistance to base remedial project managers. It is designed to identify opportunities for innovative and risk-based technology insertion, to decrease LTM costs, and to accelerate site closure. The site review portion of this program is complemented by concurrent innovative technology demonstrations of remote monitoring systems and sensor development for chlorinated solvents.

As an ever-increasing percentage of Air Force sites move into the remedial action operation and LTM phases, the Air Force has responded by focusing technology developments in this area. Two initiatives of this type are development of a diffusion sampler (now undergoing testing) and advances in vertical profiling of subsurface airflow patterns. The first of these initiatives, the diffusion sampler

system, should greatly decrease monitoring costs. Expected savings at McClellan Air Force Base alone are greater than \$1 million. The second initiative should result in dramatic increases in the efficiency of soil vapor extraction systems.

Air Force technology development efforts continue to address the problem of chlorinated solvent contamination remediation. Projects are under way to demonstrate and validate optimized phytoremediation, passive treatment walls, and substrate addition and to provide cost and performance data to remedial project managers.

At the Cutting Edge of Technology

Air Force support of innovative environmental technology development has directly benefited national efforts to mitigate risk at hazardous waste sites. Air Force bioventing and natural attenuation initiatives have resulted in the widespread acceptance of biodegradation as a remedial alternative. Air Force–developed protocols and modeling tools supporting biodegradation, such as BIOCHLOR, BIOSCREEN, BIOPLUME II, and BIOPLUME III, are accepted and endorsed by state and national environmental regulatory agencies, and are distributed by the U.S. EPA (<http://www.epa.gov/ada/models.html>). BIOCHLOR and BIOSCREEN are nationally the most utilized groundwater modeling tools for hazardous waste site characterization (http://www.epa.gov/ada/dl_stats.html).

Technology Transfer Programs

Since the 1992 creation of the Air Force's technology transfer program at the Air Force Center for Environmental Excellence (AFCEE), the Air Force has aggressively developed and harnessed innovative remedial technologies to accelerate site closures, mitigate risk, and decrease the cost of remedial actions. Along with various teaming efforts, outreach programs, and information system development projects, AFCEE's Technology Transfer Division has directly implemented the following —

- Natural attenuation at 45 sites, with an estimated cost avoidance of \$500 million
- Bioventing at 149 sites, with an estimated cost avoidance of \$20 million
- Bioslurping at 30 sites, with an estimated cost avoidance of \$11.5 million
- Internal combustion engine off-gas control for soil vapor extraction at 6 sites, with an estimated cost avoidance of \$3.5 million.

Program Direction

The Air Force environmental restoration team has provided excellent leadership in completing cleanup actions for the identified Installation Restoration Program sites and partnering with the regulatory community and the public. The Air Force continues to apply all available resources to accomplish the goals outlined in the *Air Force Environmental Program Management Guidance* —

- Reduce risk to human health and the environment. Take appropriate and timely action to reduce or eliminate potential risks to human health and the environment posed by environmental contamination.
- Comply with federal, state, and local regulatory requirements and orders pertaining to cleanup of the environment and eliminate the need for any enforcement actions.
- Develop partnerships. Enhance and sustain the Air Force environmental commitment through productive partnering and active community-involvement programs.
- Involve stakeholders. Where there is sufficient and sustained community interest, establish RABs including representatives of federal, state, and local regulatory agencies and the local community.
- Evaluate cost and performance. Use new, innovative, or best available technologies that expedite the cleanup process and lower costs while achieving cleanup results that are as good as or better than those achieved through use of standard technologies.
- Enter into cleanup agreements when legally required or when deemed to be in the Air Force's and stakeholders' best interest for facilitating cleanup. Continue to comply with all existing agreements as required. Agreements should reflect realistic schedules that meet the funding criteria of the Air Force Environmental Restoration Program.
- Prevent future contamination by preventing pollution and minimizing waste.
- Consider future land use in developing cleanup strategies.
- Ensure that all actions necessary for protection of human health and the environment are taken before sale or transfer of property from the United States to any other person or entity, in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and DoD policy.

Outreach

The Air Force is committed to involving the public in its cleanup program in a manner that allows timely and meaningful input from the community on cleanup efforts. The Air Force has encouraged the establishment of community forums, or RABs, under the provisions of CERCLA and Executive Order 12580 (*Superfund Implementation*) to “provide community outreach involvement” and to “conduct a proactive program to provide information about environmental cleanup.” These forums are crucial to establishing trust and credibility between the public and the Air Force and maintaining them throughout the cleanup process.

Air Force RABs also provide feedback and update RAB members and the public on important cleanup issues discussed during RAB meetings. The Air Force actively supports these forums. To ensure that every community that wishes to form a RAB can do so, the Air Force periodically surveys communities where historically there has been little or no sustained interest in forming a RAB to determine whether such interest has developed.

For both RAB members and the public, a primary source of cleanup information is the installation information repository. These repositories contain information and data related to groundwater and soil contamination and are accessible to all members of the general public. In addition to the documentation that CERCLA requires, as part of the administrative record, each Air Force repository includes press releases and copies of articles, newsletters, and fact sheets.

As important as the foregoing outreach mechanisms are, the Air Force’s efforts to reach every stakeholder are not limited to the RABs or to efforts strictly required by applicable environmental statutes and regulations. To supplement these, Air Force installations have established proactive programs to release cleanup information to the public. These programs include, but are not limited to —

- Mailing general information to households surrounding Air Force bases
- Sending information letters to residents
- Conducting information fairs at locations in the community
- Providing information at local malls

- Submitting articles to local media outlets, including ethnic-oriented media
- Going door-to-door in neighboring communities with teams of technical experts to explain the cleanup program to residents. To ensure that outreach reaches all area residents, the teams include not only English-speaking experts, but also experts fluent in other languages.

BCTs also provide timely and meaningful input on cleanup issues at closing bases. In FY99, the Air Force Base Conversion Agency hosted a review of its cleanup program for all BCTs. This review provided an opportunity to discuss, explain, and coordinate on important issues affecting the cleanup program. It also provided program guidance to the BCTs on cleanup strategies for achieving RC and site closeout while focusing on the transfer of land.

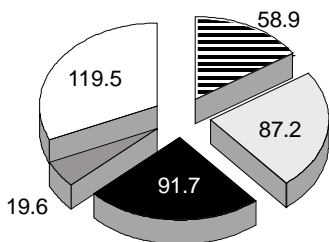
These various efforts reflect the Air Force's commitment to maintaining an open, visible, and accountable cleanup program while achieving its goals of implementing cleanup actions and site completion.

Funding

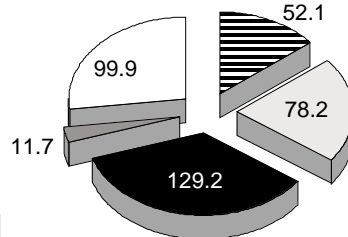
In FY99, Air Force active installations obligated \$371.1 million in environmental restoration funds — approximately 29 percent of the overall ER FY99 DoD program budget. The Air Force's Environmental Restoration funds increased to \$374.8 million in FY00 and are projected to increase to \$376.3 million in FY01. In FY99, Air Force spent approximately 65 percent of its Environmental Restoration funds on design work, interim or final cleanup actions, and long-term operations and monitoring. This percentage is expected to decrease slightly (to 62 percent) in FY00 and to increase substantially (to 72 percent) in FY01. Air Force BRAC obligated \$147.8 million in environmental funds in FY99. The planned BRAC funding levels for FY00 and FY01 are \$125.8 million and \$140.5 million, respectively.

**Air Force Environmental Restoration Funding Profile
(in millions of dollars)**

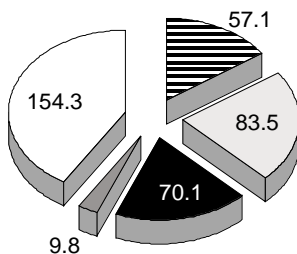
FY98 ER, Air Force Funds Executed
Total = \$376.9 million



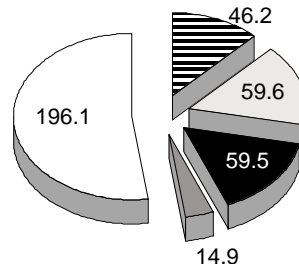
FY99 ER, Air Force Funds Obligated
Total = \$371.1 million



FY00 ER, Air Force Execution Planned
Total = \$374.8 million



FY01 ER, Air Force Planning Estimate
Total = \$376.3 million



Management
 Investigation
Cleanup Categories
 Interim Action
 Design
 Cleanup*
*Includes estimated LTM costs

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