



2023 Secretary of Defense

# Environmental Awards

Environmental Restoration, Installation  
Montgomery Air National Guard Base

## Introduction

Montgomery Air National Guard Base (ANGB), home to the 187th Fighter Wing (FW), is located approximately six miles southwest of downtown Montgomery, Alabama, on land leased from the Montgomery Regional Airport. The land immediately surrounding the installation is used for commercial and light industrial purposes. Montgomery ANGB boundaries encompass 187 acres of land situated west of the Montgomery Regional airport and the installation supports 1,455 military, civilian, and contract personnel. The mission at Montgomery ANGB is to deliver combat ready Airmen and aircraft for rapid deployment anytime, anywhere.

The Montgomery ANGB Environmental Restoration program also provides restoration

support for its geographically separate unit located in Dothan, Alabama, the 280th Special Operation Communication Squadron (SOCS). The 280th SOCS was originally located at the former Hall Air National Guard Station (ANGS) and encompassed approximately 10 acres. In 1996, 280th SOCS moved to a new location situated on 20 acres of land adjacent to Dothan Regional Airport.

## Background

### Montgomery ANGB

Environmental restoration activities at Montgomery ANGB began in 1987 and were conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). A Preliminary Assessment (PA) was performed to determine whether any hazardous substances had been improperly

---

disposed of or had inadvertently entered the soil or groundwater. Five sites were identified for further investigation and in 1991 a Site Investigation (SI) was conducted, formalizing those locations as installation restoration program (IRP) sites. Each of the IRP sites received a Remedial Investigation (RI) and the Alabama Department of Environmental Management (ADEM) approval for No Further Action (NFA). IRP sites 3 and 5 were closed in 1997, followed by the closure of IRP sites 1, 2, and 4 in 2000.

In 2014, a PA/SI identified four new restoration sites at Montgomery ANGB. RI activities conducted in 2016, 2017, and 2019 identified the need for further soil and groundwater sampling for these sites. Feasibility Studies (FS) for all four sites were conducted in 2020. One of the sites, OW004, is currently undergoing in-situ thermal remediation.

### **280th SOCS**

Environmental restoration activities for the 280th SOCS began when ANG ceased operations at the former Hall ANGS site in 1996. The ANGS was used for office space, motor pool and maintenance operations, and storage/dispensing of Jet Propellant-4 (JP-4) fuel, gasoline, and diesel to support aircraft training exercises and missions. A closure assessment performed when two gasoline underground storage tanks (USTs) and one JP-4 fuel UST were removed in August 1996, indicated fuel leakage into the surrounding soil and groundwater. A PA of the two remediation sites, UST Site 1 and UST Site 2, occurred from 1997-1998, and a secondary investigation in 1999-2001. Subsequent assessments were performed to characterize the subsurface, nature, extent of the releases and corrective action plan, with remediation goals, was completed in 2012. There are no IRP sites located at the current location of the 280th SOCS.

## **Accomplishments**

Significant accomplishment performed by Montgomery ANGB in fiscal years 2021-2022 (FY21-22) were: 1) acquisition of a Non-Time Critical Removal Action (NTCRA) to align with the F-35 aircraft mission conversion; 2) performance of the Data Gap Investigation (DGI) in support of the NTCRA; 3) execution of the Air National Guard State Memorandum of Agreement (ANGSMOA) involving multiple stakeholders; 4) acquiring an NFA designation from ADEM at former Hall ANGS; and 5) updating the Community Involvement Plan (CIP).

### **NTCRA Project**

*The NTCRA project is identified as mission critical because it directly supports military construction (MILCON) projects required for the F-35A beddown.*

Once Montgomery ANGB was identified as the future FY24 home of the F-35A Lighting II fighter aircraft, processing a NTCRA became mission critical since site OW004, the former Fuel Cell building, would be the ideal location for the two F-35 beddown facilities.

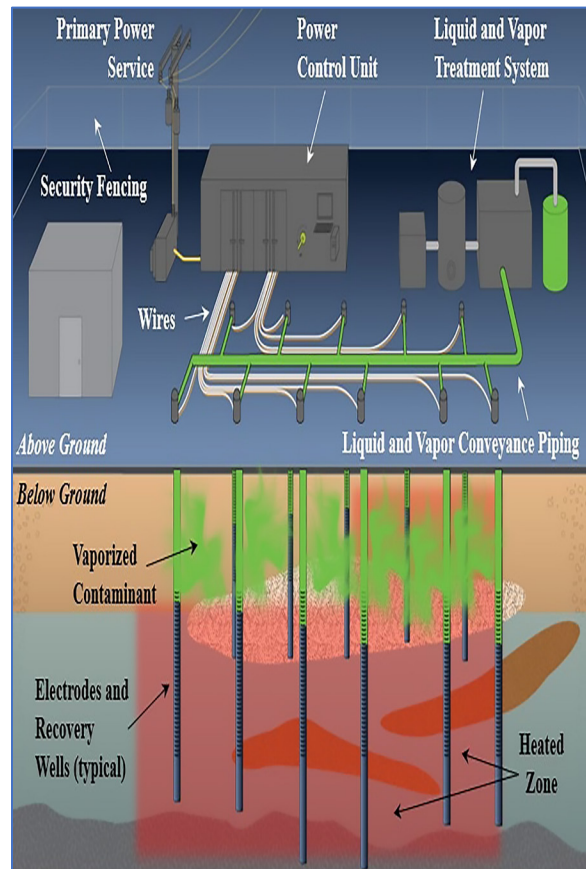
Site OW004 was identified as the best location for the F-35A Aircraft Maintenance Unit and Weapons Landing Training facility MILCON projects, valued at over \$30M. However, trichloroethylene (TCE) presented health risks to construction workers as the RI identified a maximum concentration in the soil up to 890,000 parts per billion (ppb); the regional screening level for TCE in soil is 940 ppb. This level of soil contamination presented acute and long-term health risks to construction workers, significant vapor intrusion risks to future building inhabitants, and risk to future maintenance worker performing intrusive utility work around the new facilities.

Many options were explored to expedite soil remediation but were ruled out due to cost and potential for permanent site alteration. Soil excavation and backfill was the most straight

forward method to achieve remediation goals, but it was the most expensive alternative at an estimated \$20M. Soil blending was considered as a viable, less expensive option, but the geotechnical properties of the soil would be significantly altered so far to prevent further site construction. Soil solidification was also considered, but the final condition of the soil could not be guaranteed and there was potential for a large concrete mass to remain in the subsurface permanently. Of the remedial technologies evaluated, in-situ thermal treatment using electrical resistant heating (ISTT/ERH) technology was determined to be the most appropriate and cost-effective alternative to meet remediation cleanup and human health protection requirements, as well as MILCON project schedules. Priced at \$9.2M, ISTT/ERH was not the lowest cost alternative, but it was effective at treating clay soils and provided greater certainty that remediation objectives would be achieved within a shorter timeframe for completion by July 2023 (planned start date of F-35 beddown facility construction).

Construction of the ISTT system began before the start of summer 2022. Contractors worked closely with the Base Environmental Manager and Base Civil Engineering to secure the site and used two roto-sonic drill rigs to complete more than 200 borings to install the ISTT sub-grade infrastructure. By mid-summer, 208 electrodes and 26 temperature monitoring points, comprising nearly 7,000 feet of drilling, were installed. Installation of the aboveground components including the vapor cap, over 26,000 feet of electrical cables, 3,600 feet of high temperature conveyance piping for recovered vapors, and two power control units began in the summer of 2022, concurrent with the final drilling shifts.

Contractors, Base Environmental personnel, and Civil Engineering Managers worked with Alabama Power and the base electrical contractor over a period of several months to install infrastructure to deliver an estimated



#### **In-Situ Thermal Treatment Diagram**

ERH is a technology used to volatilize site contaminants by generating steam in-situ to strip contamination from the soil and groundwater. Steam, vapors, and contaminants are recovered from the soil using a continuously operating vacuum recovery system. After recovery, contaminants are collected in activated carbon containers which allow for regulated off-site destruction.

9+ million kilowatt-hours of electricity to the ISTT system. In addition to the short timeframe, the infrastructure had to avoid interfering with the base electrical system and required independent metering. During the same period, base personnel and stakeholders were working with the Montgomery Water Works and Sanitary Sewer Board (MWWSSB) to secure a discharge Memorandum of Agreement (MOA) for the treated condensate from the ISTT system operation. This included negotiating the elimination of an indemnification clause, permit limitations, and Montgomery ANGB agreeing to store, and sample treated water



before a continuous discharge to the sanitary sewer could be implemented. The Base Environmental Management personnel's ability to negotiate discharge of waste effluent to the sanitary sewer streamlined the management of treatment system effluent and saved approximately \$200K over the life of the project.

With construction of the ISTT system complete, the system began heating in the early fall of 2022, two weeks ahead of schedule. Soil temperatures are monitored through temperature probes spaced approximately 60 feet apart at 3-foot depth increments, each in the middle of select electrode groupings. Soil heat-up generally occurs at a rate of 1 to 2 degrees Celsius (°C) per day. The ISTT system increased subsurface temperatures throughout the 26,400 cubic yard target treatment zone to more than 99°C within 60 days of start-up and is expected to achieve the NTCRA objective of 940 ppb within six months to meet the F-35 beddown facility construction schedule. The ISTT system performance has exceeded planned mass removal rates. An estimated 9,500 lbs of total volatile organic compounds (VOCs) were removed within the first months of operation.



**Electrical Resistance Heating System**  
Overhead view of the NTCRA site at Montgomery ANGB.

Remediation completion will be determined following the collection and analysis of at least two sets of soil samples. In some portions of the site, this will require a removal

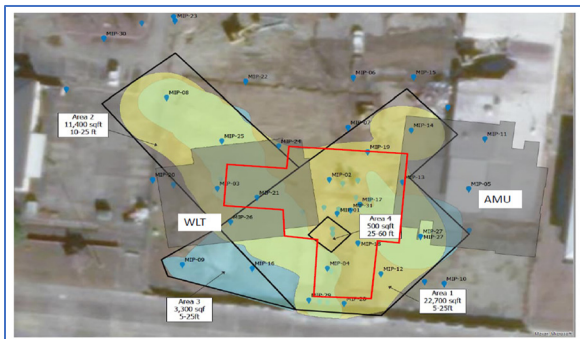
efficiency of more than 99.99%, which the ISTT system is designed to achieve. Once soil samples confirm cleanup levels have been achieved, the ISTT system will be removed, which is anticipated to occur in June 2023, one month ahead of the scheduled start of the F-35 beddown facility construction.

### **Data Gap Investigation**

Due to the expedited need to prepare site OW004 for construction and the high levels of soil contamination, NTCRA provisions of CERCLA were proposed to remove the immediate human health and environmental hazards posed by the TCE and other VOCs. The RI/FS data was sufficient to estimate the soil treatment volume, but to execute the NTCRA project, additional data was required to determine and improve delineation of soil contamination. A data gap investigation (DGI) and the NTCRA project were both planned for execution in FY21, with the DGI occurring first to collect the data needed to support the NTCRA project. Despite the intricacies of the contracting process, both projects were successfully awarded in September 2021.

The DGI kicked off October 2021 and was completed February 2022, with data being provided to the NTCRA project contractor as it became available. To meet the tight implementation schedule, the conceptual ISTT system design was initiated before the DGI was completed. The DGI comprised the use of high-resolution site characterization to refine the nature and extent of the TCE, vinyl chloride, and 1,2,3-Trichloropropane concentrations which exceeded the ADEM screening levels. The DGI provided thorough delineation of site OW004 soil and identified maximum concentrations of TCE in soil of 3,200,000 ppb, (extremely high). The DGI also indicated the contamination had migrated further than indicated in the RI but was not as deep as originally estimated. The installation Environmental Restoration Program promptly worked to modify the contract to secure additional resources required to fully

remediate the plume. Restoration contractors used a membrane interface probe for soil and groundwater sampling to address the remaining data gaps. The SI, RI, and DGI data were integrated into a three-dimensional model to finalize the target treatment zone, update the ISTT design, and complete the Remedial Action Work Plan.



### Data Gap Investigation Results

The red outline illustrates the contamination identified in the Remedial Investigation. The black border outlines what contamination was discovered during the Data Gap Investigation.

There was excellent coordination between the two contractors to avoid losing precious time. The NTCRA project contractor started the work plan and remedial design in October 2021, a combined document was completed in May 2022 and coordinated for regulatory review. Approval to proceed was provided by ADEM while specific details related to screening standards and other issues in the work plan were coordinated with ADEM. The NTCRA contractor was able to mobilize and start system construction in June 2022, three months ahead of schedule. The traditional timelines to complete a DGI, remedial design, and work plan typically take more than two years. In this case, through excellent coordination and cooperation with our contractors, regulators and all interested parties, this effort will be successfully completed in eight months!

### Air National Guard State Memorandum of Agreement/Stakeholder Involvement

The core of the Montgomery ANGB Environmental Restoration Program success

is rooted in proactive engagement with local stakeholders. Regulatory involvement has been essential to successes on the NTCRA project to date and will continue to be essential through completion of the NTCRA project. ADEM's support of the NTCRA project has been invaluable. As a result, the NTCRA results should achieve closure of soils at site OW004 within the scheduled timeframe.

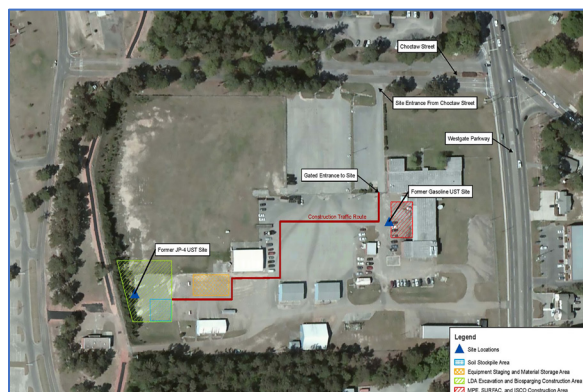
Due to the removal of Defense Environmental Restoration Program authority in 2018, the National Guard Bureau lost the ability to access Defense State Memorandum of Agreement funding for required state-level regulatory oversight. As a result, the National Guard Bureau established an alternative program, the ANGSMOA, which was established to fund accelerated regulatory oversight. A new MOA for the ANGSMOA program and related Joint Execution Plan was negotiated and signed by the State Adjunct General and ADEM. Execution of this MOA, in accordance with the Joint Execution Plan, was essential for the NTCRA project to continue. After explaining the importance and necessity of the ANGSMOA with ADEM and the State Military Department, the Adjutant General granted approval before the end of June 2022. While agreements of this nature generally take six months to complete, Montgomery ANGB leadership and Environmental Management personnel secured this agreement in three months based on persistent interaction and direct support by the Director of Staff Air for the Adjutant General.

Accomplishing a project of this magnitude and importance with such a condensed timeline required extraordinary support and collaboration among many stakeholders and disciplines to plan, contract, and execute the NTCRA. Montgomery ANGB Environmental Management personnel collaborated with multiple organizations and personnel during all phases of the project, including various National Guard Bureau (NGB) offices, with

the NGB Restoration Branch as the lead collaborator. Environmental Management personnel also worked closely with installation Civil Engineers and the Mission Support Group Commander, the MWWSSB, Alabama Power, and numerous contractors to solve all logistical issues during ISTT system setup. Examples of operational difficulties encountered and mitigated include negotiation of an expedited MOA with the MWWSSB, accelerated demolition of former Fuel Cell building, intricate installment of four electrical power poles by Alabama Power while accounting for utility integrity, and navigating multiple sink holes discovered during drilling.

### Hall ANGS Site Closeout

Upon completion of the Corrective Action Plan (CAP) for the former Hall ANGS site in 2012, remediation began at the site in 2013 utilizing bio-sparging and installation of passive vapor recovery trenches. After the performance period ended in 2016, Montgomery ANGB instituted a long-term monitoring plan with contractor support on the remaining wells to ensure ADEM UST CAP requirements were met, with the goal of achieving NFA for UST Sites 1 and 2. However, at the conclusion of the long-term monitoring, the contractor recommended bio-sparging activities resume at UST Site 1 and in-situ chemical oxidation be performed at UST Site 2. Remediation activities and monitoring continued until 2019, when results of the analyses for several chemicals of concern (COC), to include benzene, methyl tert-butyl ether, naphthalene, and total petroleum hydrocarbons, from the monitoring wells indicated all were below method detection limits. Montgomery ANGB continued to pursue the cleanup standards as defined by the Alabama Risk Based Corrective Action UST Guidance Manual. In this case, state regulatory standards were more stringent than CERCLA or federal UST requirements (280 Code of Federal Regulations).



**Former Hall ANGS Installation Remediation Sites**  
Overhead view of former Hall ANGS with location of the JP-4 fuel and gasoline UST remediation sites.

After numerous discussions with the City of Dothan and ADEM, an agreement was reached to use cleanup standards determined protective of human health and the environment for commercial use of this property. This agreement eliminated the need for further remediation to reach residential standards. Subsequently, the Montgomery ANGB and the City of Dothan coordinated on one final round of well sampling in 2021 to validate COC concentration levels. Because of the positive working relationship, the City of Dothan agreed to fund the last round of sampling, resulting in an estimated cost savings of \$400K for Montgomery ANGB. Site closeout was completed December 2021 which included removal of the treatment system, abandonment of monitoring and injection wells, and related piping. ADEM issued NFA for the former Hall ANGS in February 2022. The City of Dothan now has use of the property, and Montgomery ANGB has no future environmental liabilities at the former Hall ANGS.

### Community Involvement Plan

Community involvement is a top priority at Montgomery ANGB. The installation revitalized their CIP in 2021 to enable meaningful community engagement throughout the environmental restoration process. The National Contingency Plan requires the lead agency to prepare a CIP prior to commencement of RI field activities,



however, the existing CIP was from 1991, and only established the information repository and maintenance of the administrative record. To achieve the goals of effective and open communication among stakeholders, Montgomery ANGB decided to update the CIP.



#### **Community Involvement with Tribal Leaders**

Herbert Johnson Sr. of the Alabama Couthatta Tribe of Texas exchanges flags with Alabama Governor Kay Ivey. The Alabama Couthatta Tribe of Texas is one of nineteen tribes Montgomery ANGB contacted during the CIP update.

Developing a CIP is traditionally achieved by conducting in-person community interviews to identify community stakeholder interests

and communication preferences. However, Montgomery ANGB was unable to pursue this process due to the COVID-19 pandemic. In lieu of in-person interviews, Montgomery ANGB developed an online questionnaire to identify interests and preferences for this CIP. A link to the online questionnaire was emailed to a diverse group of over 600 residents, elected officials, county and city department heads, community leaders, business owners, and environmental- and community-based organizations in May 2021. Additionally, approximately 230 hard copy letters were mailed or hand delivered to residents in the area surrounding Montgomery ANGB to ensure thorough community outreach was accomplished.

The NTCRA project demonstrated Montgomery ANGB's steadfast commitment to community involvement by preparing and posting the Action Memorandum to a public accessible website and advertising its availability in the local newspaper for a 30-day public comment period. No comments from the public were received demonstrating Montgomery ANGB's success in keeping the community informed and effectively implementing its CIP.