FINAL
PROPOSED PLAN FOR SITE OW011
AT
KEY FIELD ANGB, MS

Contract No. 47QRAD20D1128
Task Order No. W9133L23F6000

Prepared for:

National Guard Bureau
Logistics and Installation Directorate, Operations Division
Restoration Branch
NGB/A4OR

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Introduction

Under the management of the Department of Defense (DoD), the Environmental Restoration Program (ERP) coordinates the evaluation and cleanup of environmental contamination at active DoD installations and properties formerly owned or used by the DoD. The National Guard Bureau (NGB) conducts the portion of ERP environmental cleanup projects applicable to Air National Guard (ANG) units and facilities.

This document is the Proposed Plan (PP) for Site OW011 at the Mississippi ANG (MS ANG) 186th Air Refueling Wing (ARW) at the Key Field ANG facility, Meridian, Mississippi (Figure 1). In accordance with ANG ERP protocol, Site OW011 is managed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This PP fulfills the CERCLA requirements to provide public notification of the proposed environmental cleanup plan for Site OW011. Before this cleanup can be implemented, the NGB is required to publish this notice and solicit public comments. The environmental cleanup has been approved by the Mississippi Department of Environmental Quality (MDEQ).

The focus of environmental investigations at Site OW011 was to evaluate the impacts of an oil/water separator (OWS) in the vicinity of Building 200 (Engine Shop) located below a parking lot and grassy area off the northwest corner of the building. The original OWS was removed and replaced in 2007. During the CERCLA investigation phase for Site OW011, a closure report for removal of the old OWS was not available for review, and it is unknown if releases occurred during its use.

According to a Preliminary Assessment (PA) conducted in 2013 and a Remedial Investigation (RI) in 2016, volatile organic compounds (VOCs) are present in groundwater at low levels.

The NGB has issued this PP to notify the public of the proposed environmental cleanup action at Site OW011 and to facilitate community input regarding the cleanup.

This PP presents the NGB's plan to remove tetrachloroethene (PCE) from the site groundwater according to MDEQ requirements. The purpose of the PP is to:

- Summarize soil and groundwater conditions at Site OW011 and the findings from the 2014 Preliminary Assessment (PA)/Site Inspection (SI) and 2016/2017 RI for Site OW011.
- Describe the proposed cleanup plan (remedial action).
- Solicit public comment on the proposed cleanup plan to be included in the Administrative Record as the final Record of Decision (ROD) prior to implementing the cleanup.

This PP provides a summary of the Site OW011 history, including site assessment activities, site assessment results, the selection logic for the groundwater cleanup technology, and the groundwater cleanup approach. Detailed discussion of the site assessment and overall plan is provided in the site documents listed on page 2. Upon request, these documents will be made available for public review in the Administrative Record maintained at the following location:

Meridian-Lauderdale County Public Library
2517 7th Street
Meridian, MS 39301
601-693-6771
Hours: Monday–Saturday (9 A.M. – 6 P.M.)

This PP contains key information discussed in the site documents, but it is not a substitute for the site documents or other information contained in the Administrative Record. The NGB encourages the public to review the site documents to obtain more information about the site.

The public comment period on this Proposed Plan begins on May 2, 2024 and ends June 3, 2024. During the public comment period, written comments should be submitted to:
Robert Lewis
3501 Fetchet Avenue
Joint Base Andrews MD, 20762-5157
(240) 612-8473 or
robert.lewis.100.ctr@us.af.mil

If community members indicate a preference for presenting their comments verbally during the 30-day public comment period, the ANG will provide an opportunity during a public meeting at the Key Field Environmental Management Office, Meridian, Mississippi. However, the public meeting will only be held if one or more specific requests are made by the public. The public meeting, if requested, will be held to present and explain the Proposed Plan and the remedial action being proposed for Site OW011. Confirmation of the public meeting, if one is to be held, will be published following the comment period.

Site Background

Installation Description

The 186th ARW of the MS ANG is stationed at the Key Field Municipal Airport. The airport is located in Lauderdale County, approximately 4 miles southwest of the center of Meridian, Mississippi (Figure 1), at the intersection of Interstates 59 and 20. The Key Field ANG facility occupies 117 acres in the northeast portion of the airport complex. The facility, which provides air refueling support, employs over 1,250 military personnel and 300 civilian technicians. The Key Field ANG facility has been active since 1939.

Operations at the base that may have generated hazardous materials and wastes include aircraft maintenance; ground vehicle maintenance; aerospace ground equipment maintenance; fire department training; and petroleum, oil, and lubricant management and distribution. These operations support such activities as corrosion control, nondestructive inspection, fuel cell maintenance, and engine maintenance. Varying quantities of waste oils, recovered fuels, spent cleaners, strippers, and solvents were disposed of during these activities.

Site Description

Site OW011 is located in the east portion of the Key Field ANG facility bordering the Installation property boundary, northwest of Building 200 (Figure 2). The area is open, flat, and mostly covered with concrete and some grassy areas between parking areas and buildings. The focus of previous investigations at Site OW011 was to evaluate the residual VOC impacts to groundwater in the vicinity of the Building 200 (Engine Shop).

Summary of Previous Investigations

Previous investigations conducted at Site OW011 of the Key Field ANG facility include:

- PA (Automated Sciences Group, Inc., 1988)
- PA/SI (Leidos, 2015)
- RI (TEC-Weston JV, 2017)
- Feasibility Study (FS) (TEC-Weston JV, 2018)

The main findings of the Site OW011 investigations were as follows:

- No contaminants were detected in soil at concentrations that exceeded regulatory criteria.
- PCE was detected in groundwater at concentrations exceeding the maximum contaminant level (MCL).

Based on the results of the FS, the recommended remediation alternative to address PCE contamination in groundwater at OW011 is long-term monitoring (LTM). According to MDEQ requirements, the MCL of 5 micrograms per liter (µg/L) for PCE is the remediation goal to reach a No Further Action (NFA) status at Site OW011 without restrictions (Site Closure). Periodic groundwater sampling will accurately assess PCE concentrations as they naturally attenuate. Successful LTM will be demonstrated by documenting degradation of PCE to below the MCL. Common monitored natural attenuation (MNA) parameters, including nitrate+nitrite, sulfate, chloride, methane, ethane, and ethene, sampled during the RI indicated limited degradation is occurring in groundwater and, given the trace concentrations of PCE, even limited biological degradation activities may be sufficient to decrease concentrations below MCLs.

Site Characteristics

Soil

According to the RI, a uniform clay to silty clay layer is encountered at ground surface to between 2.5 and 4 feet below ground surface (ft bgs) at Site OW011. The clay to silty clay is underlain by a uniform sand layer which extends to depths of 10 ft bgs. Typically, a medium-grained, poorly graded sand with interbedded silty sand layers extends below this to 40 ft bgs, and a silty clay layer at this depth serves to confine the surficial aquifer from the underlying Wilcox aquifer.

Based on the results of investigations completed at Site OW011, no soils require cleanup.

Groundwater

Consistent with regional hydrogeology, groundwater in the shallow unconfined aquifer at OW011 is approximately 2 to 13 ft bgs. The approximate direction of groundwater flow is toward the southeast, which is consistent with the regional flow direction identified in the Wilcox Group.

PCE in groundwater is limited to localized shallow wells. During the latest Site OW011 sampling event (June 2017), PCE concentrations ranged from non-detect (less than 0.2 micrograms per liter [µg/L]) to 8.64 µg/L (Figure 3).

Summary of Site Risks

A baseline risk assessment was not conducted for soil at Site OW011 because VOCs were not detected above project action limits. Data did not indicate a consistent source zone but did indicate low-level concentrations of PCE were consistently detected in groundwater samples.

A baseline risk assessment was also not conducted for groundwater at OW011 because PCE concentrations exceed the MCL; PCE was therefore considered a chemical of concern (COC) and was automatically addressed during the FS.

Remedial Action Objectives

As stated in the 2018 FS, the remedial action objectives (RAOs) for Site OW011 are as follows:

1. Achieve levels of contamination consistent with requirements of the MDEQ and Applicable or Relevant and Appropriate Requirements (ARARs) for unlimited use/unrestricted exposure (UU/UE). The federal MCL for PCE in drinking water, followed by MDEQ, is 5 micrograms/l, which is an ARAR.
2. Prevent human health exposure to contaminated groundwater that could be damaging to human health.
3. Comply with all NGB policy to perform response actions in accordance with CERCLA and complete remediation while occupying the property to avoid post-lease remedial activity.

Summary of Remedial Alternatives

An FS was completed for Site OW011 (TEC-Weston JV, 2018) to identify the remedial technology most appropriate to address PCE contamination in groundwater. The FS entailed developing RAOs and identifying areas at Site OW011 that exceeded the ARARs for the site. Four alternatives were selected for detailed analysis for Site OW011:

- Alternative 1: No Action (required per CERCLA)
- Alternative 2: Institutional Controls (ICs)
- Alternative 3: LTM
- Alternative 4: In-situ Chemical Oxidation (ISCO) with Monitoring

The alternatives were developed based on the following criteria:

- Effectiveness
- Implementability
- Cost

These criteria are defined as follows:

- Effectiveness: *Effectiveness* is the degree to which an alternative complies with remedial goal objectives and ARARs, safeguards human health by reducing potential exposure to contaminated media, and protects the environment by preventing further transport of the contaminants. Alternatives that meet the criteria are considered effective; alternatives that are less effective or not effective are eliminated from further consideration.

- Implementability: *Implementability* refers to the technical and administrative feasibility of implementing the alternative.

  Technical feasibility refers to the ability of process options to be constructed and reliably operated, and to meet technology-specific regulations until a remedial action is complete. The term also includes operation and maintenance (O&M), replacement, and monitoring (if needed) of technical components after the remedial action is complete.

  Administrative feasibility refers to the ability to obtain any necessary approvals; availability of treatment, storage, and disposal services and capacity; and requirements for, and availability of, specific equipment and technical specialists. Options that are technically or administratively difficult may be eliminated from further consideration.

- Cost: *Cost* refers to relative construction and long-term O&M costs. At this stage of the analysis, cost is discussed qualitatively, such as low, medium, and high. Under this criterion, the cost of each alternative was estimated using standard methods. For details on estimated costs, refer to the FS report (TEC-Weston JV, 2018).

A brief description of each alternative is presented below.

Alternative 1: No Action

The No Action alternative was included as a baseline. This alternative has the lowest cost but was not selected because it would not satisfy the RAOs.

Alternative 2: Institutional Controls

No remedial activities would be implemented with the IC alternative. Human health risks would be abated with the use of controls which prohibit the installation of groundwater wells at OW011. Although in the absence of a continuing source, contaminant levels will likely decrease, satisfying RAOs. However, without monitoring data site closure cannot be achieved. The total cost to implement Alternative 2 was estimated to be $16,000.

Alternative 3: Long-Term Monitoring

Under this alternative, the groundwater would be monitored to document natural attenuation to meet ARARs. In addition to collection of groundwater samples for analysis of PCE and its breakdown products, LTM may include analysis of select groundwater samples for monitored natural attenuation (MNA) parameters (e.g., nitrate+nitrite, ferrous iron, sulfate, and alkalinity) to document degradation processes. Successful implementation of the remedy may be demonstrated by four consecutive quarters of "clean" samples (i.e., PCE concentrations below ARARs) or statistical demonstration of degradation to below ARARs. LTM is not inherently protective of human health and the environment; however, groundwater at OW011 is not currently used as a potable water resource and an IC prohibiting the installation of new groundwater wells near OW011 will eliminate unhealthy exposure to groundwater during LTM. The total cost of Alternative 3 was estimated at $120,000.

Alternative 4: In-situ Chemical Oxidation with Monitoring

Under this alternative, PCE in groundwater will be treated via ISCO during two injection events. ISCO of chlorinated organics is achieved by introduction of an oxidizer such as permanganate (MnO_4) to the subsurface. The MnO_4^- is introduced into the subsurface through temporary wells or by direct injection. MnO_4^- is injected into the subsurface as potassium permanganate ($KMnO_4$) or sodium permanganate ($NaMnO_4$) and is considered a strong oxidizer of PCE. The total cost of Alternative 4 was estimated at $220,000.

Preferred Cleanup Alternative

The cleanup alternatives referenced above were evaluated individually and compared against the nine CERCLA criteria to help select a preferred alternative. These nine criteria include:

1. Overall protection of human health and the environment with respect to achieving and maintaining reductions in the risk of potential exposure. Reduction can be accomplished through treatment, engineering, and/or ICs.

- Alternatives 3 and 4 protect human health and the environment through documented permanent reduction of the site contaminants below ARARs and satisfactorily reduce human health risk. While Alternatives 1 and 2 may eventually reduce site contaminants, they provide no method of confirming natural degradation or protection from potential migration of COC-impacted groundwater off site; however, Alternative 2 would eliminate the exposure pathway and reduce human health risk.

2. *Compliance with ARARs* evaluated against state and federal requirements.

- Alternatives 3 and 4 would achieve ARARs through documentation of permanent destruction of site contaminants. Although Alternatives 1 and 2 could achieve ARARs through natural attenuation, there is no method of confirming the success of natural degradation or protection from potential migration of contaminants offsite.

3. Long-term effectiveness and permanence of the alternative to meet the RAOs, including the adequacy and reliability of the controls used to manage remaining contamination over the long term.

- Alternatives 1, 2, 3, and 4 have potential for long-term effectiveness through permanent destruction of the site contaminants. The attenuation is permanent and irreversible. Because there is no way of gauging success with Alternatives 1 and 2, they do not achieve the RAOs.

4. Reduction of toxicity, mobility, or volume through treatment of contaminants by the proposed alternative.

- Alternatives 1, 2, and 3 would not employ treatment or removal processes to address contamination in groundwater. The only reduction in mobility, toxicity, or volume of PCE and its breakdown products would be through natural attenuation. Alternative 4 employs active treatment of contaminants in groundwater to reduce toxicity, mobility, and volume. However, trace concentrations of contaminants in groundwater at OW011 may limit the impact or effectiveness of ISCO and Alternative 4 has the potential to mobilize PCE and its breakdown products during the ISCO process.

5. Short-term effectiveness of the alternative to protect human health and the environment during the construction and implementation of the alternative until the cleanup goals are met.

- Alternative 4 has potential to achieve ARARs on a short-term basis by introducing oxidants into the subsurface. Any short-term risks associated with Alternative 4 (e.g., exposure during the installation of injection wells) will be mitigated with an IC, effective during all ISCO activities. Alternatives 2 and 3 could require a significant amount of time to establish a microbial community sufficient to degrade site contaminants. Alternative 4 provides the most short-term effectiveness.

6. Implementability of the alternative with respect to the technical and administrative aspects of construction, operation of the alternative, and availability of goods and services to construct the alternative.

- Alternatives 1, 2, and 3 would not require remedial construction or invasive activities that would pose a risk to the community, Installation personnel, contractors, or the environment as a result of implementations. However, Alternative 4, which requires installation of temporary wells for ISCO injections, would be the most disruptive option.

7. Cost in terms of total present worth, including capital costs, indirect costs, and O&M costs.

- The estimated costs for each alternative are as follows:
  - Alternative 1: $0
  - Alternative 2: $16,000
  - Alternative 3: $120,000
  - Alternative 4: $220,000

  Based on these costs, Alternatives 1, 2, or 3 are most reasonable.

8. State/support agency acceptance and concurrence with the preferred cleanup activity.

MDEQ does not concur with Alternative 1. Agency acceptance of Alternatives 2, 3, and 4 is likely, based on prior feedback from MDEQ.

9. Community acceptance of the preferred cleanup activity.

- Community acceptance will be determined pending the review of comments received during the public comment period.

Table 1 indicates whether the remediation alternative satisfies each evaluation criterion and how the alternatives compare.

Table 1. Analysis of Remedial Alternatives for Site OW011

Criteria	Alternative 1 (No Action)	Alternative 2 (IC)	Alternative 3 (LTM)	Alternative 4 (ISCO)
Overall Protectiveness of Human Health and the Environment	DNS	S	S	S
Compliance with ARARs	DNS	S	S	S
Long-Term Effectiveness and Permanence	DNS	DNS	S	S
Reduction of Toxicity, Mobility, or Volume Through Treatment	DNS	DNS	S	S
Short-Term Effectiveness	DNS	S	S	S
Implementability	S	S	S	S
Cost	S	S	S	S
State/Support Agency Acceptance	DNS	S	S	S
Community Acceptance	TBD	TBD	TBD	TBD

DNS = Does Not Satisfy Criterion
S = Satisfies Criterion
TBD = To Be Determined

RI sampling results indicated that residual contamination in groundwater at Site OW011 is a good candidate for LTM because the identified source zones at Site OW011 have all been removed or neutralized and residual VOCs remain in groundwater at low levels. Additionally, these COC are relatively immobile and not likely to migrate offsite. In the short-term, LTM is not inherently protective of human health and the environment; however, groundwater at Site OW011 is not currently used as a potable water resource and an interim IC

would ensure protectiveness until ARARs are achieved. In the long-term, this alternative will provide overall protection of human health and the environment as the contaminant levels attenuate.

Although Alternative 4 would also achieve ARARs and likely on a shorter timeline than Alternative 3, the significantly higher cost of Alternative 4 does not appear to be justified when Alternative 3 will achieve ARARs non-invasively and for less expense. Alternative 2 is less expensive than both Alternative 3 and 4, but because there is no way of gauging success, it does not achieve the RAOs. Based on the FS, Alternative 3, LTM, was recommended to be implemented at Site OW011. Alternative 3 is protective of human health and the environment, and by utilizing the existing monitoring well network, is cost effective. By directly measuring the concentration of PCE and its breakdown products in groundwater, Alternative 3 provides qualitative data to support the eventual site closeout and UU/UE designation.

Periodic groundwater sampling would be required to accurately assess the LTM process. Groundwater samples would be analyzed for COC. Additional samples may be analyzed for MNA parameters (e.g., nitrate+nitrite, ferrous iron, sulfate, and alkalinity) on an optional basis. Geochemical indicators, such as dissolved oxygen, pH, and oxidation-reduction potential, will be measured in the field. During LTM activities, an interim IC restricting groundwater use to monitoring activities until ARARs are achieved is also recommended to prevent unhealthy human exposure to COC.

Groundwater samples will be collected at five monitoring wells on a quarterly basis to evaluate the progress towards attaining RAOs. Successful LTM may be demonstrated to the MDEQ in one of two ways, the specifics of which will be agreed upon in a site-specific LTM Work Plan:

1. Quarterly groundwater sampling demonstrating four consecutive quarters of concentrations below ARARs; or
2. Statistical methods demonstrate the degradation of PCE (below ARARs).

Once attainment of RAOs has been demonstrated, the ANG will issue a Closure Report to the MDEQ requesting concurrence with NFA and well abandonment at Site OW011.

Scope and Role of the Action

This PP summarizes the remedial approach selection logic for addressing PCE in groundwater at Site OW011. Information used to prepare the PP is part of the Administrative Record and available for public review at the local Public Information Repository (see the *Introduction* section, page 1).

Community Participation

The ANG will make public information regarding the cleanup of Site OW011 available by maintaining a copy of the Administrative Record at the Public Information Repository (located at the Meridian-Lauderdale County Public Library; see page 1) and by publishing announcements in the local newspaper (*Meridian Star*).

The ANG encourages interested members of the community to use these resources to gain a comprehensive understanding of Site OW011, CERCLA, and the choice of the cleanup alternative/technology at the site.

The 30-day public comment period for this PP is May 2, 2024 through June 3, 2024. Should the public indicate a preference to present comments on the PP verbally, a public meeting will be scheduled at the end of the public comment period at the Key Field Environmental Management Office, Meridian, Mississippi. If a meeting is required, the time and date will be announced in the local newspaper (*Meridian Star*).

Meeting minutes from any public meeting will be included in the Administrative Record file kept in the Public Information Repository. All comments from the public will be summarized and responses will be provided in the Responsiveness Summary section of the ROD, which is the document that will present the selected remedy. The ROD also will be included in the Administrative Record file.

Submit written comments by mail or email to:

Robert Lewis
3501 Fetchet Avenue
Joint Base Andrews MD, 20762-5157
(240) 612-8473 or
robert.lewis.100.ctr@us.af.mil

References

Leidos. 2015. *Preliminary Assessment / Site Investigation for Compliance Restoration Program Mississippi Air National Guard (186th Air Refueling Wing) Meridian, Mississippi*.

TEC-Weston JV. 2016. *Final RI WP, Sites OW011 and TU013, Key Field Air National Guard Base, 186th Air Refueling Wing, Meridian, Mississippi.* August.

TEC-Weston JV. 2017. *Final RI Report, Sites OW011 and TU013, Key Field Air National Guard Base, 186th Air Refueling Wing, Meridian, Mississippi.* November.

TEC-Weston JV. 2018. *Final FS Report, Building 200 Oil/Water Separator Site (OW011), Key Field Air National Guard Base, 186th Air Refueling Wing, Meridian, Mississippi*. September.

Glossary

Air National Guard (ANG): A civilian reserve component of the United States Air Force that provides prompt mobilization during war and assistance during national emergencies. The ANG is responsible for operations at the Key Field facility and for cleanup of Site OW011.

Comprehensive, Environmental Response, Compensation, and Liability Act (CERCLA): The federal law that addresses problems resulting from releases of hazardous substances to the environment, primarily at inactive sites.

Contaminants: Chemicals present in the environment that do not occur there naturally.

Groundwater: Water that occurs underground in soil pores or openings in rock. Groundwater is often pumped from municipal or domestic wells to be used for drinking water. (The groundwater beneath Site OW011 is not used for drinking water.)

In-Situ Chemical Oxidation (ISCO): A soil and groundwater cleanup technology that chemically destroys organic contaminants, such as VOCs, by introducing an oxidizing agent into the area where the contamination occurs.

Maximum Contaminant Level (MCL): Enforceable water quality standards for drinking water contaminants established by the U.S. Environmental Protection Agency (EPA) to protect the public against consumption of drinking water contaminants that present a risk to human health. An MCL is the maximum allowable amount of a contaminant in drinking water which is delivered to the consumer.

Microgram per Liter (µg/L): Unit of measurement equivalent to parts per billion (ppb). An ink concentration of 1 ppb is roughly equivalent to adding one drop of ink to one of the largest tanker trucks used to haul gasoline.

Mississippi Department of Environmental Quality (MDEQ): The regulatory agency responsible for overseeing the cleanup of contaminated sites in Mississippi. The MDEQ is the lead regulatory agency overseeing environmental actions at Key Field.

Monitoring Well: A well used to obtain groundwater samples or to measure groundwater levels.

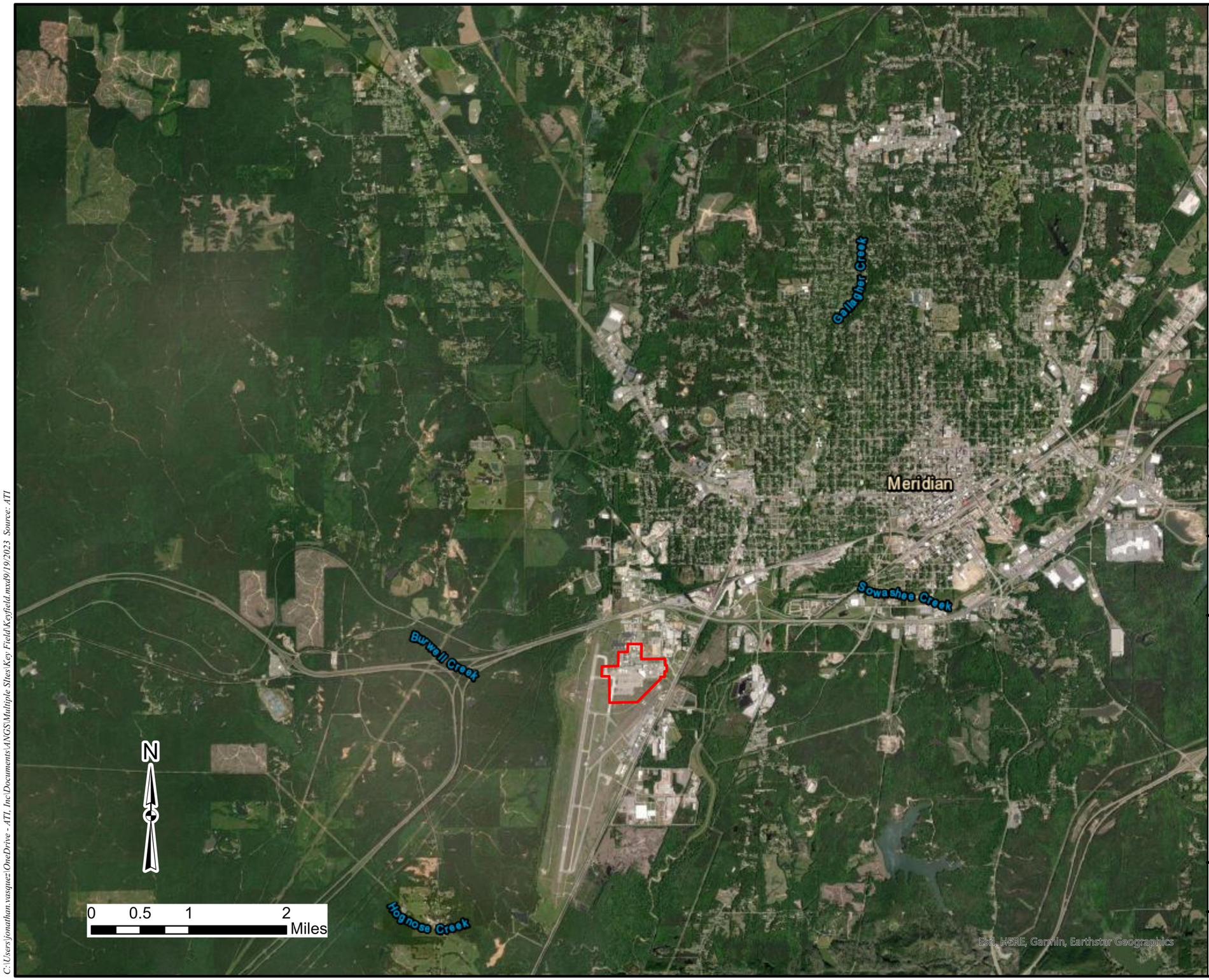
Permanganate: A strong oxidizing agent commonly used in soil and groundwater remediation and drinking water treatment. Permanganate is typically supplied as either potassium or sodium permanganate.

Proposed Plan (PP): A CERCLA document available for public review and comment regarding the plan to clean up a contaminated site. The PP typically provides a brief synopsis of site history, assessment activities, and an analysis of the cleanup options being considered, as well as the planned cleanup approach.

Remedial Action Objectives (RAOs): Narrative statements defining the extent of site cleanup necessary to meet the objective of protecting human health and the environment.

Record of Decision (ROD): A document of a brief description of the EPA's proposed action and alternatives considered to make the decision on the action.

Volatile Organic Compound (VOC): Substances containing carbon and various portions of other elements such as hydrogen, oxygen, fluorine, chlorine, bromine, sulfur, or nitrogen. These substances have a strong tendency to evaporate (volatilize) at room temperature. Many VOCs are used as solvents and as additives in fuels.



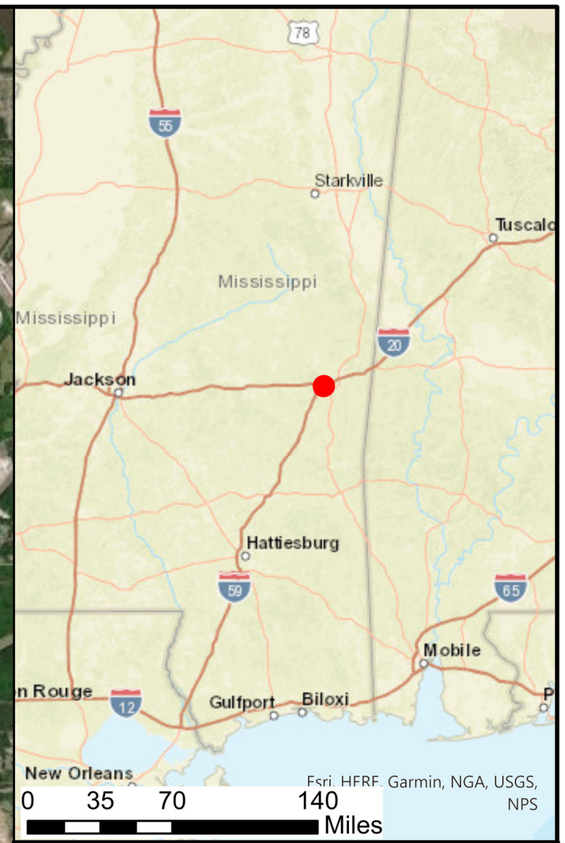


FIGURE 1
Key Field ANGB Installation Location Map

LEGEND

Installation Boundary

Notes:
MSANGB - Mississippi Air National Guard Base

Proposed Plan
Key Field ANGB
Meridian, MS

Date Created: 12/26/2023
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Version: Draft - 1

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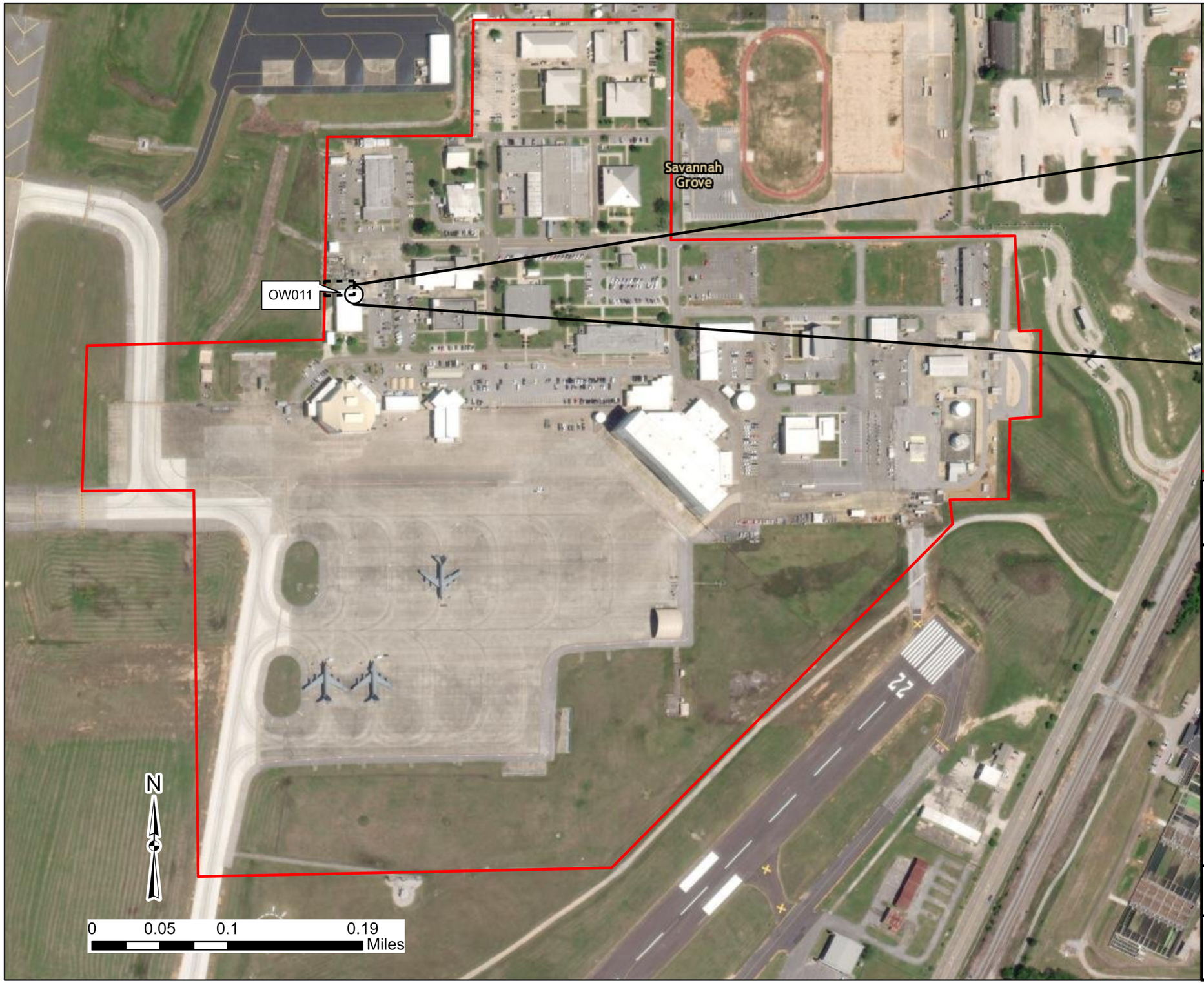

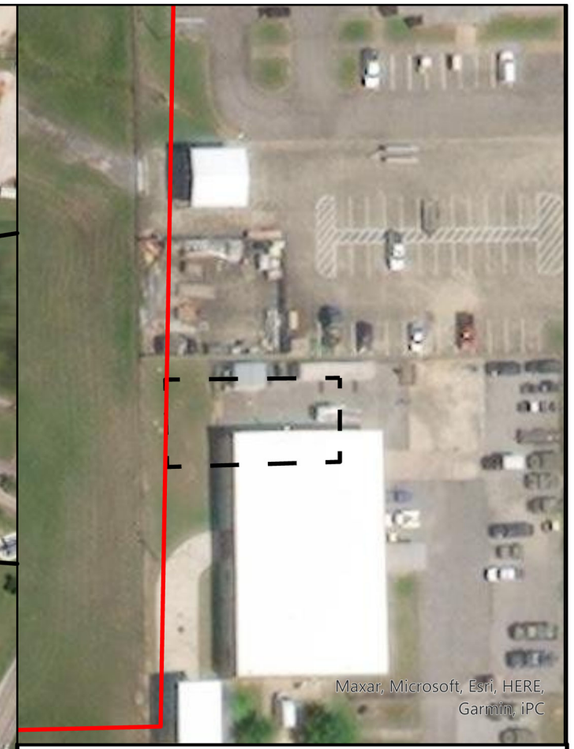

Figure 2
OW011 Site Location Map, Key Field ANGB

LEGEND

Sites

Installation Boundary

Notes:

OW011 - Building 200 Oil Water Separator (OWS)

Proposed Plan
Key Field ANGB
Meridian, MS

Date Updated: 1/19/2024
Created By: J. Vasquez
Version: Draft - 1

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