



**Bureau of Environmental Remediation
Federal Facilities Unit**
1000 SW Jackson, Suite 410
Topeka, Kansas 66612

**STATEMENT OF BASIS
October 3, 2022**

Former Sunflower Army Ammunition Plant

KDHE Project Code #: C4-046-71016

EPA ID # KS3213820878

**Solid Waste Management Unit 13 – South Acid Area Liquid Waste Treatment Plant
(LWTP) Evaporative Lagoons,
DeSoto, Johnson County Kansas**

Facility/Unit Type: SFAAP SWMU 13 LWTP aboveground tanks and associated earthen cell evaporative lagoons for treated wastewater storage

Contaminants: Ammonia, arsenic, cadmium, and nitrate

Affected Media: Surface/subsurface soils and groundwater

Proposed Remedy: NFA for surface and subsurface soils. Site-specific groundwater will be addressed under the Groundwater Operable Unit (GWOU) 2 study.

INTRODUCTION

This Statement of Basis (SB) describes the proposed corrective measures (remedy) for Solid Waste Management Unit (SWMU) 13 South Acid Area LWTP Evaporative Lagoons, at the Former Sunflower Army Ammunition Plant (SFAAP) in DeSoto, Kansas. The Kansas Department of Health and Environment's (KDHE) authority for requiring corrective action at SFAAP is based upon the KDHE Bureau of Remediation (BER) SFAAP Consent Order No. 05-E-0111 and Kansas Hazardous Waste Statutes: K.S.A. 65-3430 et seq., K.S.A. 65-3452a et seq., and K.A.R. 28-31-4 et seq. Environmental response actions at SFAAP comply with the Defense Environmental Restoration Program (10 U.S.C. §2701). The SFAAP is not on the National Priorities List.

The KDHE is issuing this Statement of Basis as part of its public participation responsibilities under the Resource Conservation Resource Act (RCRA). This document highlights the information that is presented in more detail in the facility Administrative Record (AR). The AR information includes: *Final RCRA Facility Investigation Report (RFI), SWMU 13, South Acid Area Liquid Waste Treatment Plant Evaporative Lagoons, Former Sunflower Army Ammunition Plant, De Soto, Kansas* (Law Engineering and Environmental Services, Inc., 1999), *Final Interim Corrective Measures (ICM) Completion Report, SWMU 13, South Acid Area Liquid Waste Treatment Plant Evaporative Lagoons, Former Sunflower Army Ammunition Plant, De Soto, Kansas* (Zapata, Inc., Burns & McDonnell, and Envirocon, Inc., 2019), *Final Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP)*

RCRA Facility Investigation, SWMU 13 and SWMU 27, Former Sunflower Army Ammunition Plant, De Soto, Kansas (AECOM, 2021), and Final RCRA Facility Investigation Report, SWMU 13 and SWMU 27, Former Sunflower Army Ammunition Plant, De Soto, Kansas (AECOM, 2022) and other documents. The public is encouraged to review these documents for a more complete understanding of the environmental issues at Solid Waste Management Unit (SWMU) 13 and the corrective actions that are planned. The AR locations are noted at the end of this document.

PROPOSED REMEDY

The proposed remedy for SWMU 13 is excavation and off-site disposal resulting in No Further Action (NFA) for soils. NFA means that all contaminants of concern (COCs) that may impact human health, or the environment were removed as indicated by post-confirmation sampling. Excavation and removal of surface and subsurface soil off-site to an appropriate landfill or treatment facility was completed as an Interim Corrective Measure (ICM) summarized below.

Groundwater at the site will be evaluated for sitewide COCs during the Army's site-wide assessment of groundwater operable unit, (GWOU-2). GWOU means a discrete area consisting of a single to many SWMUs and/or AOCs with actual or potential for releases to groundwater, grouped together for purposes of assessment and cleanup. The primary criteria for placement of sites with actual or potential groundwater releases into an operable unit include geographic proximity, similarity of waste characteristics and site type, and the possibility for economies of scale.

FACILITY BACKGROUND

The former SFAAP is located near DeSoto, Kansas, in the northwest corner of Johnson County. It is approximately 30 miles southwest of Kansas City, Kansas, and 16 miles east of Lawrence, Kansas. SFAAP includes approximately 9,065 acres and is surrounded primarily by agricultural land. It is bounded on the east by Spoon and Kill Creeks and on the west by Captain Creek (Figure 1). The plant consisted of production facilities, administrative and storage facilities, powerhouses, landfills, lagoons, ditches, burning grounds, sumps, projectile ranges, and waste treatment facilities. Most of the assets of the plant are no longer in active use. The Site produced nitrocellulose, nitroglycerin, and a variety of propellants from 1942-1971, acids, and nitroguanidine from 1971-1992. The plant was declared excess in 1998 by the Army and sold to Sunflower Redevelopment LLC in 2005. The site is composed of 70 SWMUs where a release of hazardous waste was identified and 27 Areas of Concern (AOCs) where hazardous waste or constituents have been identified but are not linked to a specific solid waste management practice.

SUMMARY OF SITE SWMU 13

SWMU 13, South Acid Area LWTP Evaporative Lagoons, is in the central-eastern portion of the former SFAAP, encompassing approximately 47 acres, of which the former lagoons compose 28 acres. The LWTP contained five aboveground tanks and four unlined earthen cells used as evaporative lagoons, which each measured approximately 10 feet deep (Figure 2). Calcium sulfate sludge that resulted from the wastewater treatment was settled in the lagoons to evaporate by solar energy. However, the influent rate exceeded the evaporation rate which prompted a land application program in the mid-1980s for the wastewater treatment. The land application ceased

in December 1998. Currently, the site is an open grassy field used for cattle grazing with no roads crossing the area.

Ammonia, arsenic, cadmium, and nitrate are contaminants of potential concern (COPCs) in surface and subsurface soils at SWMU 13 (AECOM 2022).

SUMMARY OF FACILITY RISKS

The LWTP Evaporative Lagoons (SWMU 13) were used to store treated wastewater from the Sulfuric Acid Regeneration (SAR) and calcium sulfate sludge from the treatment of wastewater produced in the acid production area and nitroguanidine (NQ) area. A RFI was conducted by Law Environmental in 1999 to collect subsurface soil, sludge, surface water, and groundwater samples and install monitoring wells. There were fourteen wells that had previously been installed in the area; however, six of those wells were private. Therefore, six new monitoring wells were installed as part of the RFI field work and sampled for groundwater. Several RCRA metals were detected above background levels in all media and the sludge was identified as a potential source of nitrate/nitrite and sulfate contamination (Law 1999). Nitroglycerin (NG) and NQ were detected in the groundwater samples, but not in the surface water. The results of the RFI samples indicated that contamination was migrating from the lagoons via groundwater. A closure plan developed in 1995 and approved by KDHE in 1996 addressed the remediation/denitrification of the sludge present in the lagoons by mixing soil and vegetation with the sludge, capping the lagoons with a clay cover, grading, then seeding the area with perennial grasses (AECOM 2022). Following this closure plan, primary and secondary sources of groundwater contamination were addressed through the removal of wastewater and remediation of sludge. During the RFI conducted by AECOM in 2022, 16 surface soil samples, 101 subsurface soil samples, and 25 stepout/stepdown soil samples were collected and analyzed for chemicals of interest at SWMU 13. RCRA metals, guanidine nitrate (GN) and nitroguanidine (NQ), sulfate, and hexavalent chromium did not exceed their respective soil target media cleanup levels (TMCLs). Ammonia, arsenic, cadmium, and nitrate exceeded their respective TMCLs and are considered COPCs for soil at the site.

A groundwater investigation was not included in the RFI based on the groundwater use restriction in place at SFAAP. However, a groundwater investigation will be conducted for SWMU 13 under the GWOU-2 study.

Soil screening and laboratory analytical data delineated the lateral and vertical extent of impacts of the COPCs in environmental media at SWMU 13. The majority of exceedances were located in the southern portion of the site and occurred in subsurface soil. The physical properties of both ammonia and nitrate suggest that concentrations would be susceptible to groundwater transport. Arsenic and cadmium are more susceptible to adsorb to soil particles and less mobile to groundwater transport. However, arsenic and cadmium particles bound to soil particles could be mobilized by wind and erosion processes.

INTERIM CORRECTIVE MEASURES

A closure plan for the lagoons in SWMU 13 was approved in 1996 to remediate the source of nitrate contamination by mixing the sludge with soil and vegetation (AECOM 2022). The in-situ remediation/denitrification of sludge addressed the suspected source for groundwater contamination at

the site. Soils associated with the excavation and removal of explosive foundations were characterized and remediated in the ICM performed by Zapata Incorporated, Burns & McDonnell (BMcD), and Envirocon Incorporated (2019). The rind soils and foundations associated with Account 731 (Waste Water Treatment Facility) were evaluated and remediated based on sampling results. The building in Account 731 had been removed prior to the start of the ICM field activities. Rind soils in SWMU 13 that were previously analyzed by AECOM did not require remediation in the ICM activities. There were no interior sewer removals required for Account 731. However, there were several foundation slabs and concrete gutters that required sampling and removal. Following removal, the screening samples taken for soil below the foundations and gutters were below the TMCLs and munitions of explosive concern (MEC) screening levels (Zapata, Burns & McDonnell, and Envirocon, Inc., 2019). The site was backfilled and seeded with grass following the completion of MEC removal activities in 2017.

RISK ASSESSMENT

The Army conducted a streamlined health risk evaluation by comparing RFI data to the approved TMCLs for the site. KDHE believes that proper employment of the KDHE (2015) RSK Manual values result in risk-based remediation that is consistent with federally promulgated standards, including the Safe Drinking Water Act, 42 U.S.C. §300f – 300j-26, and is protective of human health as required by Resource Conservation and Recovery Act, 42 U.S.C. §6901 et seq., including the Hazardous and Solid Waste Amendments (HSWA) and 40 CFR Part 264.101. KDHE Tier 2 risk-based cleanup goals represent concentrations at which the contaminants pose an acceptable human health risk to receptors, including sensitive groups (e.g., children or the elderly), over a lifetime.

Cleanup goals were developed for two general categories of receptors, residents and non-residents, according to the appropriate land-use designation, exposure frequency, and exposure duration. According to the Johnson County Rural Comprehensive Plan Resolution No. 079-98. *Conceptual Land Use Plan, Sunflower Army Ammunition Plant*. July 23, 1998 the area encompassing SWMU 13 is proposed to be split between multi-family residential, light manufacturing, and green space. Based on this land-use, the potential current and future receptors include:

- Current: Construction and excavation workers.
- Future: Construction workers, site workers, recreational users, and residents.

The RFI identified ammonia, arsenic, cadmium, and nitrate as COPCs at SWMU 13 based on exceedances of the residential soil TMCLs, therefore, the exposure pathway for soil was considered during the assessment. Soil: Evaluated exposure pathways include ingestion, inhalation of dust, and dermal contact (AECOM 2021). Based on comparison of the RFI results to TMCLs, which identified one cadmium exceedance and limited arsenic, ammonia, and nitrate exceedances, surface and subsurface soils at SWMU 13 do not pose a potentially unacceptable health risk. Arsenic is not considered to be a COC if it was not associated with the production process and/or is identified above TMCLs in isolated areas.

Additional evaluation of groundwater in the area will occur when work on GWOU-2 is done.

SUMMARY OF ALTERNATIVES

Two alternatives were considered for SWMU 13:

1. No Further Action (NFA) for surface/subsurface soils and groundwater. NFA means that no further actions will be taken to evaluate or reduce contaminant mass, address potential exposure pathways, or reduce the potential for contaminant migration.
2. Excavation and removal of contaminated soils above TMCLs. When the contaminated surface and subsurface soils are excavated, no further remedial action is needed to protect human health and the environment at the site.

Site-specific groundwater investigation was not conducted during the 2022 RFI due to the groundwater use restriction in place. Therefore, groundwater will not be included in the NFA remedy.

Groundwater will be evaluated for area wide contamination when the Army performs the assessment of GWOU-2.

EVALUATION OF THE PROPOSED REMEDY AND ALTERNATIVES

The KDHE has determined that NFA for soil is the appropriate remedy for SWMU 13. The prior excavation of ammonia and nitrate contaminated soils was appropriate for the site to be protective of human health and the environment. This proposal is based upon KDHE's review of all available historical documentation regarding the Site.

PUBLIC PARTICIPATION

KDHE solicits input from the community during the RCRA decision-making process to ensure that the community concerns are considered in approving the recommended remedial alternative for SWMU 13. The public is also invited to provide comments on remedial alternatives not addressed in investigation reports. KDHE has set a public comment period from October 3, 2022 to November 3, 2022 to encourage public participation in the remedy selection process. A public meeting is not scheduled at this time. If a public meeting is requested in writing with a statement of issues to be raised, the KDHE may conduct a public meeting virtually or in person to receive both oral and written comments.

ADMINISTRATIVE RECORD

The administrative record (AR) is available at the following locations:

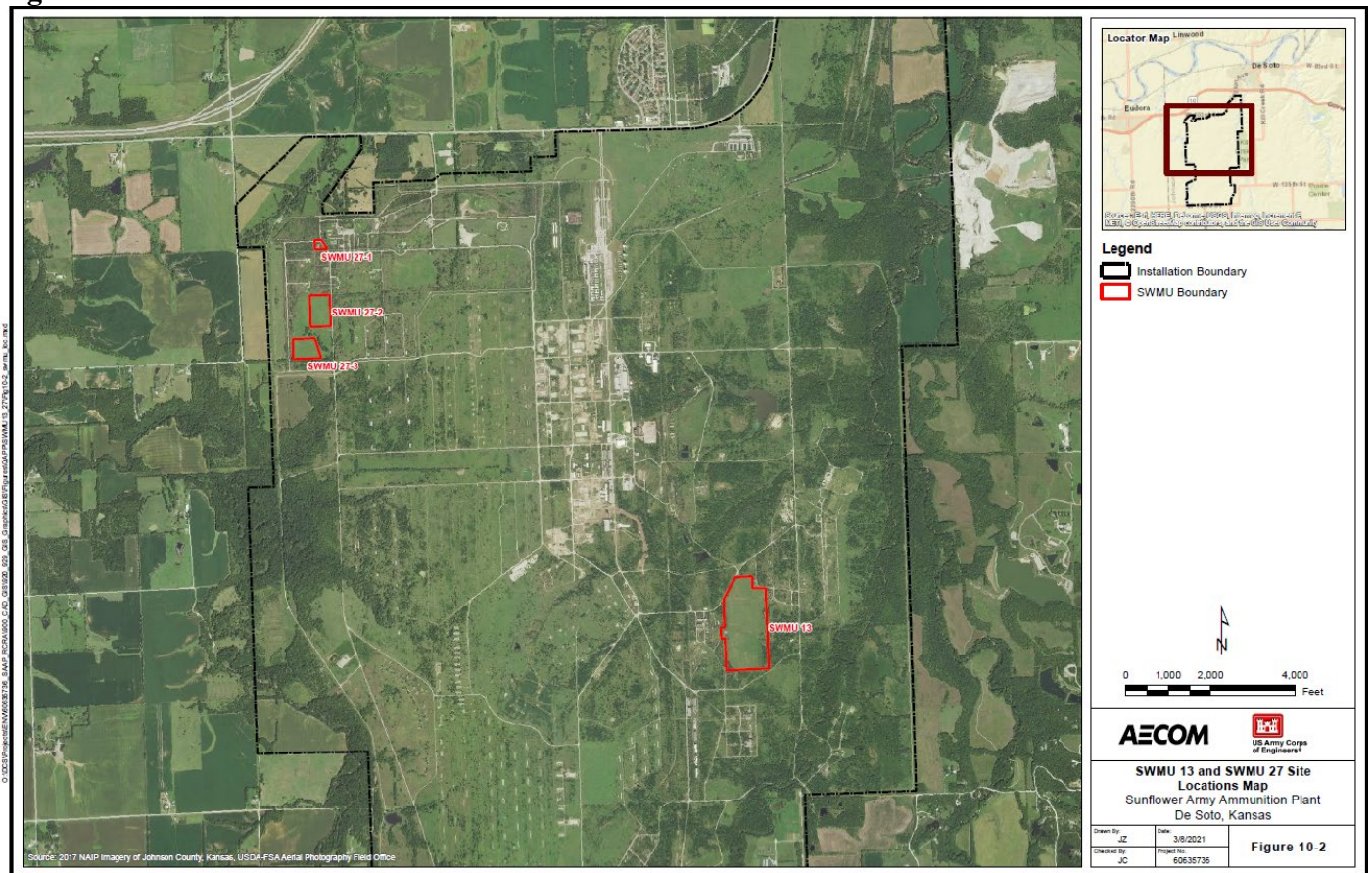
Name/Address	Contact Information	Hours
KDHE Bureau of Environmental Remediation, Federal Facilities Unit 1000 SW Jackson Street, Suite 410 Topeka, Kansas 66612	Phone: (785) 291-3066 or by email: Kyle.Skeese@ks.gov for Kyle Skeese, Project Manager for Sunflower site.	Monday - Friday: 8 a.m. - 12 p.m. and 1 p.m. - 4 p.m.

After the public comment period, KDHE will summarize and respond to all comments received in a Response to Comments document. The Response to Comments document will be incorporated into the AR and a copy will be sent to individuals who provided comments during the public comment period. To send written comments, request a public meeting, or obtain further information, please contact Kyle Skeese, Project Manager for SFAAP, at Kyle.Skeese@ks.gov or by phone at 785-291-3066.

In addition, KDHE has established a webpage dedicated to the Site, which is available online during the comment period at: <https://www.kdhe.ks.gov/716/Sunflower-Army-Ammunition-Plant>.

FIGURES

Figure 1: Site Location of SWMU 13 at SFAAP



REFERENCES

- AECOM, 2021. *Final Uniform Federal Policy Quality Assurance Project Plan RCRA Facility Investigation, SWMU 13 and SWMU 27, Former Sunflower Army Ammunition Plant, De Soto, Kansas*. March.
- AECOM, 2022. *Final RCRA Facility Investigation Report, SWMU 13 and SWMU 27, Former Sunflower Army Ammunition Plant, De Soto, Kansas*. August.
- Johnson County Rural Comprehensive Plan Resolution No. 079-98. *Conceptual Land Use Plan, Sunflower Army Ammunition Plant*. July 23, 1998.
- KDHE, 2015. *Risk-Based Standards for Kansas (RSK Manual)*, September.
- Law, 1999. *Final RCRA Facility Investigation Report, SWMU 13, South Acid Area Liquid Waste Treatment Plant Evaporative Lagoons, Former Sunflower Army Ammunition Plant, De Soto, Kansas*. April.
- Zapata, Burns & McDonnell, and Envirocon, Inc., 2019. *Final Interim Corrective Measures Completion Report, SWMU 13, South Acid Area Liquid Waste Treatment Plant Evaporative Lagoons, Former Sunflower Army Ammunition Plant, De Soto, Kansas*. February.