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Rev. 0

Final Report for Interim Stabilization of PUREX E-Field (200-E-107) Contamination Area

Prepared for the U.S. Department of Energy, Richland Operations Office
Office of Environmental Restoration

Submitted by: Bechtel Hanford, Inc.

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October 2001

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METRIC CONVERSION CHART

Into Metric Units			Out of Metric Units		
If You Know	*Multiply By*	*To Get*	*If You Know*	*Multiply By*	*To Get*
Length			**Length**		
inches	25.4	millimeters	millimeters	0.039	inches
inches	2.54	centimeters	centimeters	0.394	inches
feet	0.305	meters	meters	3.281	feet
yards	0.914	meters	meters	1.094	yards
miles	1.609	kilometers	kilometers	0.621	miles
Area			**Area**		
sq. inches	6.452	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.093	sq. meters	sq. meters	10.76	sq. feet
sq. yards	0.0836	sq. meters	sq. meters	1.196	sq. yards
sq. miles	2.6	sq. kilometers	sq. kilometers	0.4	sq. miles
acres	0.405	hectares	hectares	2.47	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	grams	grams	0.035	ounces
pounds	0.454	kilograms	kilograms	2.205	pounds
ton	0.907	metric ton	metric ton	1.102	ton
Volume			**Volume**		
teaspoons	5	milliliters	milliliters	0.033	fluid ounces
tablespoons	15	milliliters	liters	2.1	pints
fluid ounces	30	milliliters	liters	1.057	quarts
cups	0.24	liters	liters	0.264	gallons
pints	0.47	liters	cubic meters	35.315	cubic feet
quarts	0.95	liters	cubic meters	1.308	cubic yards
gallons	3.8	liters			
cubic feet	0.028	cubic meters			
cubic yards	0.765	cubic meters			
Temperature			**Temperature**		
Fahrenheit	subtract 32, then multiply by 5/9	Celsius	Celsius	multiply by 9/5, then add 32	Fahrenheit
Radioactivity			**Radioactivity**		
picocuries	37	millibecquerel	millibecquerel	0.027	picocuries

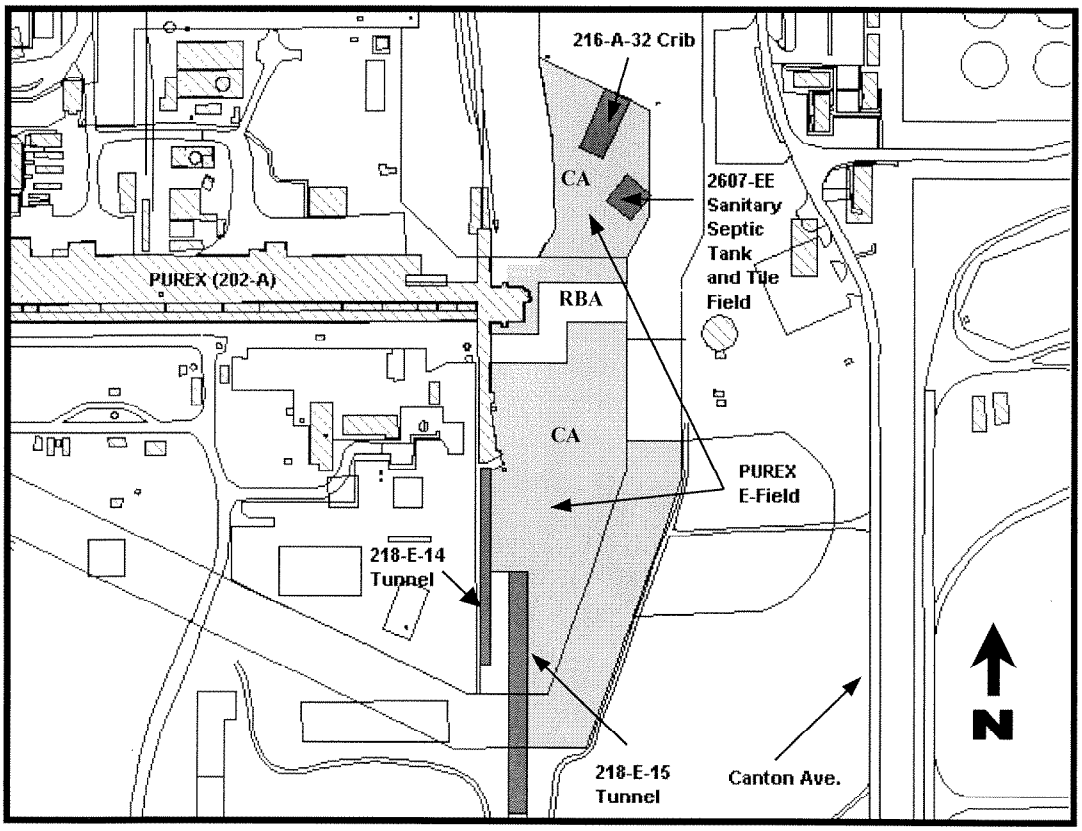
1.0 INTRODUCTION

The Plutonium-Uranium Extraction (PUREX) E-Field (200-E-107) is located in the 200 East Area of the Hanford Site and within the PUREX Facility (202-A) security fence. The site is located on the east side of the PUREX tunnels and east of the PUREX railroad cut. Figure 1 shows the location of the E-Field.

The PUREX E-Field is a large, irregularly shaped area that was posted as a contamination area (CA). The area east of the tunnels (218-E-14 and 218-E-15) extends into the area of the double security fence. The area east of the railroad cut is located inside the inner-security fence (razor wire) and includes the 216-A-32 Crib and 2607-EE Sanitary Septic Tank and Tile Field. In May 2000, a vehicle access corridor was posted as a radiological buffer area (RBA) and separated the northern portion of the CA from the southern portion. Both sections are considered to be one waste site.

The PUREX E-Field is approximately 1.62 ha (4 ac) in size.. Residual soil contamination from years of PUREX Facility operations resulted in large posted CAs. The contamination is not attributed to a single contamination incident.

Figure 1. Location of PUREX E-Field (200-E-107).



The objectives of the interim stabilization for the PUREX E-Field involved reducing risk to workers, simplifying ongoing surveillance and maintenance activities at the site, and transforming the site to a safer and more stable configuration while awaiting the identification and implementation of final remediation actions.

This report describes the stabilization operations used to control the spread of contamination and eliminate CA postings at the site. The project was accomplished by covering each CA with clean fill material, removing sections of fencing, and backfilling specific confined spaces. Interim stabilization activities were completed by downposting the site to an underground radioactive material (URM) area.

2.0 SITE PREPARATION

Individuals from multiple disciplines participated in site walkdowns to aid in planning and identifying hazards. Drawings were examined to identify utilities, and cultural and biological resource evaluations were performed.

Electrical service to the closed-circuit television (CCTV)/camera towers and microwave units (alarm system) located in the southern portion of the site were disconnected during completion of PUREX deactivation work. These actions were part of the end point criteria associated with the deactivation of the PUREX Facility. Earthmoving equipment was mobilized to the site. The Washington State Department of Health determined that a Notice of Construction for routine radiation area remedial action stabilization activities was not needed.

3.0 INTERIM STABILIZATION

Interim stabilization began at the southern portion of the PUREX E-Field and proceeded in a northern direction. Stabilization efforts were accomplished by backfilling clean fill material over the area. Numerous structures in the area were flagged prior to beginning stabilization actions. Water spray was applied as needed for dust suppression during earthmoving activities.

A portion of the outer-security fence (barbed wire) surrounding PUREX was removed during the stabilization of the PUREX E-Field. This section of chain-link fencing was approximately 289.56 m (950 ft) in length and extended from the 218-E-15 tunnel to an access gate directly east of the PUREX Facility. New chain-link fencing was installed later, connecting the outer-security fence to the inner-security fence on the east side of the 218-E-15 tunnel. Clean fill material was obtained from a borrow pit located south of PUREX. The borrow pit was saturated with water as needed prior to the removal of clean fill material. Earthmoving equipment, which was able to operate in most areas, was used to place clean fill material over the site (Figure 2).

Figure 2. Bulldozer Pushing Clean Fill Material at PUREX E-Field.

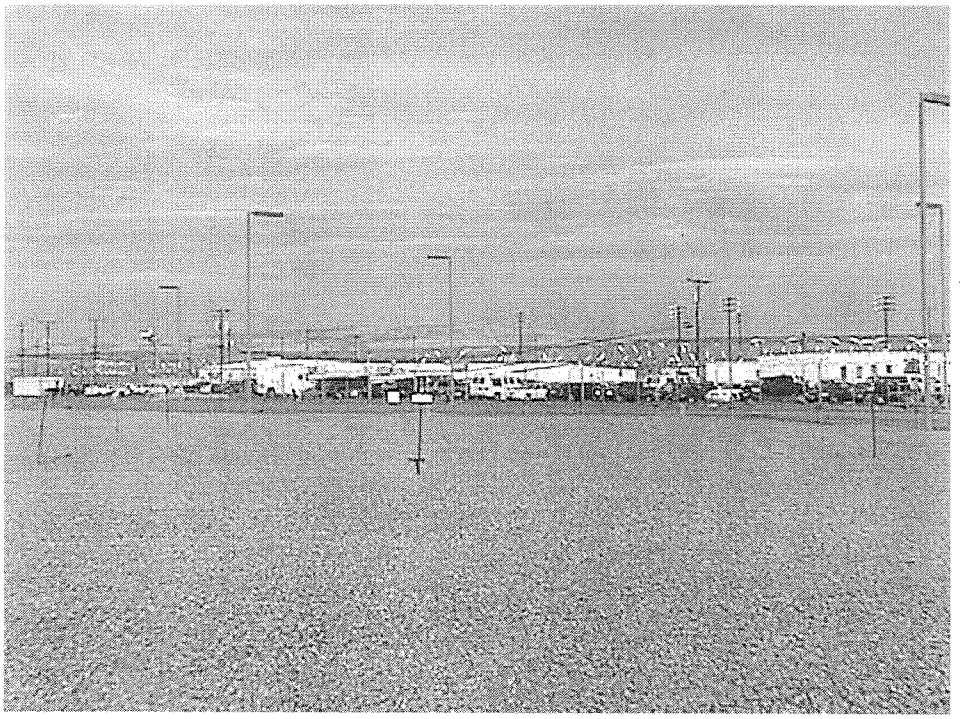
Demolition of several microwave units was required during the stabilization process. The units consisted of short-range and long-range microwave transmitters and receivers. Each microwave unit was demolished and buried in place. Also, eight confined spaces were backfilled with clean fill material. Backfilling the confined spaces was necessary during this project to successfully stabilize the area and remove potential cave-in hazards. The backfilling process for the confined spaces involved removing the manhole covers and saturating the interior with water before the placement of fill material. Earthmoving equipment was used to push the fill material into each confined space. The covers were then returned and the confined space was covered with clean fill material.

Backfill material was placed up to the base of the berms covering the 218-E-14 and 218-E-15 tunnels. Clean fill material was also backfilled up to and around the base of each CCTV unit. Two confined spaces (2A-251 and 2A-252) currently exist within the overall URM posting, each with a RBA posting. Light-duty posts and chain surround each area. These confined spaces are located east of the 218-E-14 tunnel.

Earthmoving equipment was then used to cover the northern portion of the PUREX E-Field with clean fill material. As a result, the 216-A-32 Crib and 2607-EE Sanitary Septic Tank and Tile Field were stabilized with fill material. The 216-A-32 and 2607-EE sites were previously backfilled and had tumbleweeds growing on the surface level. Three concrete post markers and two pipe risers are visible at the 216-A-32 site, and the 2607-EE site has one visible pipe riser. Light-duty posts and chain surround the 2607-EE site. Figures 3 and 4 display photographs of the 2607-EE site before and after completion of interim stabilization activities, respectively.

Figure 3. 2607-EE Before Interim Stabilization.

Figure 4. 2607-EE After Interim Stabilization.



The fill material was graded with a bulldozer and roadgrader to obtain a minimum depth of 60.96 cm (24 in.). Gravel was then placed on top of the fill material at a minimum depth of 10.16 cm (4 in.). Figure 5 shows a photograph of a dumptruck unloading gravel in the northern portion of the site. The layer of clean fill material and gravel was thicker in some locations within the PUREX E-Field area due to ruts and minor depressions in the existing surface. The RBA separating the site into two sections was also backfilled with clean fill material.

Figures 6 and 7 display photographs of the PUREX E-Field area before and after stabilization activities, respectively. The total volume of clean fill material hauled during this project was approximately 9,868 m^3 (12,907 yd^3). The total volume of gravel hauled during this project was approximately 1,645 m^3 (2,152 yd^3).

Figure 5. Dumptruck Unloading Gravel.

Interim stabilization actions were finalized by downposting the RBA and CAs to a URM area. The PUREX E-Field is currently free of vegetation and has a gravel surface. Equipment decontamination was not required or performed in support of interim stabilization activities. The site will become a part of the bare-ground vegetation control program.

4.0 COST AND SCHEDULE

Field work began on July 23, 2001, and was completed on September 27, 2001 (a total of 39 working days were required). The cost of the project through September 27, 2001, was $278,100, which included planning and field work. The burdened costs are summarized in Table 1. The work was performed under work package #20010524006.

Figure 6. PUREX E-Field Before Interim Stabilization Activities.

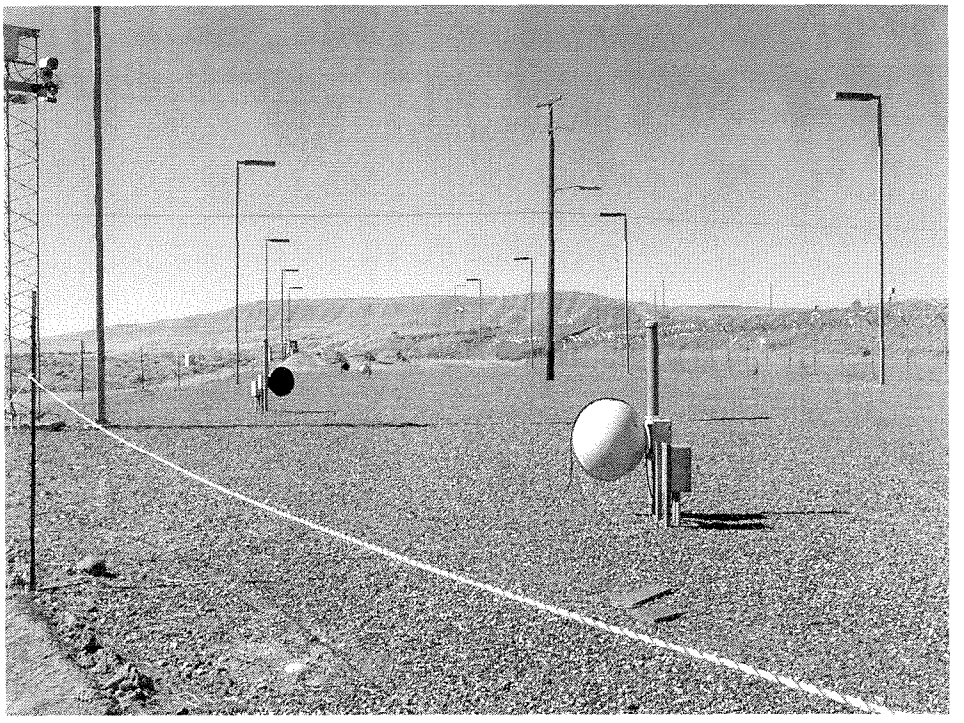


Figure 7. PUREX E-Field After Interim Stabilization Activities.

Table 1. Burdened Cost and Hours Summary.

Labor/Tools	Costs	Hours
Manual labor	$131,850	2,285
Non-manual labor	$51,350	813
Materials	$56,900	--
Equipment	$38,000	--
Total	$278,100	3,098

5.0 LESSONS LEARNED

There were no lessons learned for this project.

6.0 BIBLIOGRAPHY

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