



## SITE CERTIFICATION SUMMARY

This Site Certification Summary provides information about the **Fairfield, Ohio, Site**. The U.S. Department of Energy Office of Legacy Management is responsible for long-term stewardship of the site under the **Formerly Utilized Sites Remedial Action Program**.

### Site Description and History

The Fairfield, Ohio, Site (formerly the Associate Aircraft site) is located at 3660 Dixie Highway, about 15 miles northwest of Cincinnati. The site is comprised of the former Associate Aircraft building and an exterior parking lot shared by two other companies. The U.S. Atomic Energy Commission (AEC) and National Lead of Ohio contracted with Associate Aircraft Tool and Manufacturing Company to machine hollow slugs from natural uranium (i.e., neither depleted nor enriched) from February to September 1956 for the Hanford reactor in Washington and the Savannah River reactor in South Carolina. The primary activities included machining, hollow drilling, reaming, and turning slugs to a final outside diameter. Records suggest that Associate Aircraft machined about 95,000 slugs during the eight-month contract.

### Site Remediation Timeline

**October and November 1956** — The site was decontaminated to levels considered acceptable under the regulations in effect at that time.

**June 1992** — Uranium contamination was found in some concrete expansion joints and on several overhead horizontal surfaces.

**September 14 through 18, 1992** — Oak Ridge National Laboratory conducted a radiological survey of the remainder of the property, identifying additional residual uranium contamination inside the building and in isolated spots outdoors.

**1993** — The Fairfield, Ohio, Site was designated for remedial action under the Formerly Utilized Sites Remedial Action Program (FUSRAP).

**December 1994 to June 1995** — Bechtel National Inc. (BNI) defined the extent of contamination and performed remedial-design engineering and remedial action at the Fairfield site.

**September 16, 1996** — The U.S. Department of Energy (DOE) published a notice of cleanup certification for the site in the Federal Register.

### Certification Docket Contents

The [Certification Docket](#) documents the successful decontamination of radioactively contaminated areas at the Fairfield site in 1994 and 1995. The docket includes documents supporting DOE certification that conditions at the subject property comply with the criteria and standards applicable to the property. In addition, the certification docket provides documents certifying that the use of the property will not result in any significant radiological hazard to the general public from residual radioactivity that originated during activities conducted by DOE or its predecessor agencies.

### Remedial Action

BNI remediated the Fairfield site from December 1994 to June 1995 as part of the FUSRAP. To accomplish remedial action tasks without adversely affecting ongoing site production activities, the contaminated portions of the building were subdivided into eight zones, and remedial action proceeded in a phased approach. The decontaminated components in each zone — including roof trusses, walls, floors, and expansion and crack-control joints — were very similar. See the [Fact Sheet](#) for details.

FUSRAP objectives for the Fairfield site were to:

- Identify and assess sites formerly utilized in support of early Manhattan Engineer District (MED)/AEC nuclear work to determine whether further decontamination or control is needed.
- Decontaminate or apply controls to the sites, where needed, to permit conformance to current applicable guidelines.

- Dispose of or stabilize all generated radioactive waste residues in an environmentally acceptable manner while minimizing waste volumes.
- Accomplish work in accordance with appropriate landowner agreements and local and state environmental and land use requirements to the extent required by federal law and applicable DOE orders, regulations, standards, policies, and procedures.
- Certify, at the completion of the remedial action, that the condition of the site complies with guidelines and that the release of the site without radiological restrictions is appropriate.
- Remove hazardous waste that is mixed with radioactively contaminated waste resulting from MED/AEC-related work, regardless of its characteristics, as listed under the Resource Conservation and Recovery Act.



New building addition at the Fairfield, Ohio, Site (May 2006).

## Post-Remediation Sampling

To verify that no radioactivity exceeding guidelines remained in the remediated areas, BNI conducted radiological surveys after completing remediation in each zone. The surveys included direct surface measurements on interior surfaces, such as the roof decking, trusses, walls, concrete, piping, and trenches that remained after removing the expansion and crack-control joints. BNI analyzed soil from excavated areas using gamma spectroscopy and determined external gamma-exposure rates using a pressurized ionization chamber. Soil analyses occurred both in the field and in the laboratory.

Exterior soil samples from each area were collected at a frequency of 25 equally spaced plugs per 100-square-meter (m<sup>2</sup>) surface area with a depth of 15 centimeters (cm) and diameter of 2.5 cm. Interior (sub-slab) soil samples were also collected from each trench created by the removal of contaminated expansion or crack control joints. After determining a 100-m<sup>2</sup> area in each trench, BNI collected and composited 25 equally spaced plug-soil samples within that area for gamma spectroscopy analysis.

Post-remedial action direct surface contamination measurements and soil samples verified the removal of the residual radioactive material. External gamma-exposure rate measurements, taken within each zone, ensured that the exposure rate from all pathways, except radon decay, was well below the guideline of 20 micro roentgen per hour above background for habitable structures.

For more detailed results of the post-remediation sampling, see the [Site Certification Data Summary Worksheet](#) on page 4. For a detailed map of the site and sampling locations, see the [Site Overview Map](#) on page 5.

## Current Site Conditions

All residual radioactive materials above the site-specific guidelines were removed from the site and disposed as low-level radioactive waste, except for material in a 167-m<sup>2</sup> area immediately east of the eastern wall roll-up door of Zone VIII. The depth and concentrations of the low-level radioactivity predicted future use, which included calculating remediation costs and conducting a hazard assessment. Sample results from the assessment indicated that the maximum total uranium contamination in soil was 134 picocuries per gram (pCi/g). This level exceeds the DOE site-specific soil criterion of 35 pCi/g total uranium but not the uranium concentration guide derived by Argonne National Laboratory for this site of 280 to 970 pCi/g. The DOE-approved hazards assessment described the effects of this localized area of residual radioactive material, using reasonable future-use scenarios. The assessment found that a total uranium concentration of 134 pCi/g is equal to a potential dose of 4.15 millirems per year (mrem/yr), which is less than 5% of the 100-mrem/yr dose limit. The results of the hazard assessment and the cost of any additional action indicate that no further characterization or remediation is necessary in this isolated area.

The post-remedial action survey data indicated that all areas of the Fairfield site determined to be contaminated during characterization surveys now comply with standards applicable to residual radioactive contamination. DOE determined that the site's radiological conditions complied with the Department's decontamination criteria and standards for protecting health, safety, and the environment. DOE declared that the site was appropriate for future use without radiological restrictions. DOE has been responsible for long-term stewardship of the Fairfield site since 1996. The stewardship requirements and protocols are captured in the FUSRAP Long-Term Surveillance and Maintenance Plan, which is available on the DOE Office of Legacy Management website ([www.energy.gov/lm/fairfield-ohio-site](http://www.energy.gov/lm/fairfield-ohio-site)).



## ADDITIONAL INFORMATION

Documents related to FUSRAP activities at the Fairfield, Ohio, Site are available on the LM website at [lmpublicsearch.lm.doe.gov/SitePages/default.aspx?sitename=Fairfield](https://lmpublicsearch.lm.doe.gov/SitePages/default.aspx?sitename=Fairfield).

For other information on site history or current long-term stewardship activities, please contact us at:

**U.S. Department of Energy**  
**Office of Legacy Management**  
**2597 Legacy Way**  
**Grand Junction, CO 81503**

Email:

[FUSRAPinfo@lm.doe.gov](mailto:FUSRAPinfo@lm.doe.gov)  
[public.affairs@lm.doe.gov](mailto:public.affairs@lm.doe.gov)

DOE Office of Legacy Management  
**(970) 248-6070**



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# Fairfield, Ohio, Site Certification Data Summary Worksheet

One table referenced in the Fairfield Certification Docket provides the evidence used to certify the site as clean.

The "Post-Remedial Action Report" is the BNI report "Post-Remedial Action Report for the Associate Aircraft Site, Fairfield, Ohio" (July 1996).

Post-Remedial Action Radiological Survey Results for the Associated Aircraft Site

Zone	Component	Number of Samples/ Measurements	Direct Surface Contamination		Transferable Surface Contamination		External Gamma- Exposure Rate (μR/h) <sup>a,b</sup>	Total Uranium Concentration (pCi/g) <sup>b</sup>
			Alpha	Beta/Gamma	Alpha	Beta/Gamma		
			(dpm/100 cm <sup>2</sup> )	(dpm/100 cm <sup>2</sup> )	(dpm/100 cm <sup>2</sup> )	(dpm/100 cm <sup>2</sup> )		
I	Roof trusses	40	--- <sup>c</sup>	52 - 2,716	<1 - 63	<1 - 205	--- <sup>d</sup>	--- <sup>e</sup>
II	Roof trusses	282	<2 - 444	27 - 3,070	<1 - 66	<7 - 247	6.9	
	Walls	19	<10 - 31	402 - 1,054	<1 - 2 <sup>d</sup>	<4 - 29 <sup>d</sup>		
	Floor	547	<-4 - 114 <sup>f</sup>	<31 - 957	--- <sup>g</sup>	--- <sup>g</sup>		
	Eastern wall roll-up door	7	169 - 845	<54-845	--- <sup>g</sup>	--- <sup>g</sup>		
	Trenches		--- <sup>h</sup>	--- <sup>h</sup>	--- <sup>g</sup>	--- <sup>g</sup>		1.06 - 22.40
III	Roof trusses	198	<2 - 94	<25 - 1,898	<5 - 28	<39 - 102	6.9	
	Floor	465	<4 - 131	<29 - 914	--- <sup>g</sup>	--- <sup>g</sup>		
	Trenches		--- <sup>h</sup>	--- <sup>h</sup>	--- <sup>g</sup>	--- <sup>g</sup>		8.94 <sup>i</sup>
IV	Roof trusses	297	<2 - 69	<24 - 569	--- <sup>g</sup>	--- <sup>g</sup>	6.9	
	Walls	153	<4 - 141	<25 - 781	--- <sup>g</sup>	--- <sup>g</sup>		
	Floor	290	<2 - 142	<24 - 1,680	<1 - 5	<86 - 90		
	Trenches	88	<2 - 52	146 - 1,485	<1 - 8	<5 - 90		9.78 <sup>i</sup>
V	Roof trusses	251	<2 - 1,013	<29 - 3,481	<1 - 36	<3 - 62	7.7	
	Walls	266	<2 - 192	<31 - 2,416	<1 - 5	<7 - 18		
	Floor	1,145	<2 - 110	<43 - 2,947	<1 - 5	<3 - 52		
	Trenches	27	<2 - 92	<29 - 922	--- <sup>g</sup>	--- <sup>g</sup>		23.06 <sup>i</sup>
VI	Trenches	27	<2 - 92	<29 - 922	--- <sup>g</sup>	--- <sup>g</sup>	6.8	16.52 <sup>i</sup>
VII	Northern parking lot	10	<2 - 65	54 - 265	--- <sup>g</sup>	--- <sup>g</sup>		6.86 <sup>i</sup>
	Southern side force control building	198	<2 - 89	50 - 695	--- <sup>g</sup>	--- <sup>g</sup>		
	Southern side trenches	5	<-36 - (-7) <sup>j</sup>	553 - 829	--- <sup>g</sup>	--- <sup>g</sup>		4.36 <sup>i</sup>
VIII	Trenches	69	<9 - 74	<27 - 1,740	<-1 - 5 <sup>i</sup>	<-4 - 44 <sup>f</sup>	6.4	0.86 - 1.3
DOE Guideline:			5,000	5,000	1,000	1,000	<20 <sup>j</sup>	35

<sup>a</sup>The external gamma-exposure rate was measured for the zone listed.

<sup>b</sup>Results include background levels for the Fairfield area.

<sup>c</sup>Alpha measurements on the roof traces not taken.

<sup>d</sup>Because of the size and location of Zone 1, the external gamma-exposure rate for Zone 1 is included in the measurements for Zones III and V.

<sup>e</sup>No excavation performed or soil removed in Zone 1.

<sup>f</sup>"< -" sign indicates that the measurement was less than the MDA and that after background was subtracted, the numerical value was negative (e.g., <MDA result minus >MDA background = negative result indicated by "<-").

<sup>g</sup>Transferable measurements required when the criterion for transferable surface contamination (1,000 dpm/100 cm<sup>2</sup>) is exceeded in direct measurements.

<sup>h</sup>Direct surface contamination measurements are included in the results for the entire zone floor.

<sup>i</sup>One measurement or composite sample collected because of the limited area remediated.

<sup>j</sup>Less than 20 μR/h above background in habitable structures, or a maximum of 100 mrem/yr for all pathways, excluding radon.





# Fairfield, Ohio, Site Map



U.S. DEPARTMENT OF ENERGY  
OFFICE OF LEGACY MANAGEMENT

Work Performed by  
**Navarro Research & Engineering, Inc.**  
Under DOE Contract Number DE-EM0000421

## Fairfield, OH, Site

-  FUSRAP Site Boundary
-  Original Site Boundary

### Zones of Remedial Action

-  Zone I
-  Zone II
-  Zone III
-  Zone IV
-  Zone V
-  Zone VI
-  Zone VII
-  Zone VIII

DATE PREPARED:

April 18, 2019

FILE NAME:

FFO\_DELIVERABLE

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