Seymour, Connecticut, Site

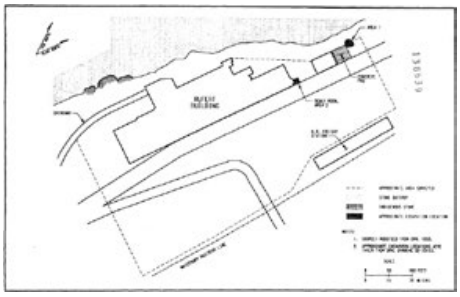
U.S. DEPARTMENT OF ENERGY | Legacy Management

SITE CERTIFICATION SUMMARY

This Site Certification Summary provides information about the **Seymour, Connecticut, 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 Seymour, Connecticut, Site (formerly the Seymour Specialty Wire site) is located at 15 Franklin Street in Seymour, Connecticut, about 50 miles southwest of Hartford. The site covers about 60 acres and contains 20 buildings. From 1962 to 1964, Reactive Metals, Inc., under contract with the U.S. Atomic Energy Commission, researched and developed the process for extruding natural uranium metal at the site. This work was confined to one building (the Rufert Building) on the northern end of the property. See Figures 1 and 2 for a map of the surveyed area and a floor plan of the Rufert Building.



Map of the survey area around the Rufert Building at the Seymour site, which includes two exterior locations where contaminated soil was excavated. (Click image to enlarge.)

Site Remediation Timeline

1964 — A radiological survey was conducted of the 4.8-acre parcel of the site that included the Rufert Building.

January 26, 1977 — Oak Ridge National Laboratory (ORNL) conducted a preliminary radiological survey of the Rufert Building.

August 26, 1980 — ORNL conducted a follow-up radiological survey to determine if radiological residues at the Rufert Building exceeded U.S. Department of Energy (DOE) guidelines.

December 17, 1985 — The site is designated for remediation under the Formerly Utilized Sites Remedial Action Program (FUSRAP).

May and June 1992 — ORNL conducted more extensive characterization surveys to define locations and boundaries of contamination.

August 1992 - March 1993 — DOE conducted a remedial action/cleanup project.

September 1992 - March 1993 — ORNL conducted independent verification surveys.

January 24, 1995 — DOE published a notice of cleanup certification for the site.

2004 — DOE transferred responsibility for the Seymour site to the DOE Office of Legacy Management (LM).

Certification Docket Contents

The Certification Docket documents the successful remediation of radioactively contaminated areas at the Seymour site. The docket includes documents supporting DOE certification that the subject property complies with applicable radiological guidelines and standards. In addition, the certification docket provides documents certifying that the use of the property will not result in any measurable radiological hazard to the general public.

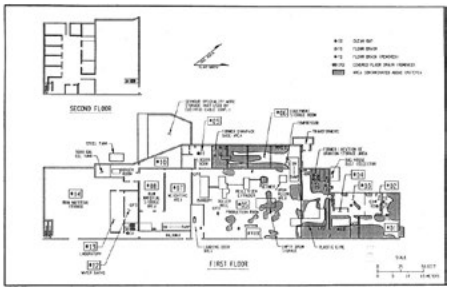


Figure 2. Floor plan of the contamination in the Rufert Building at the Seymour site. (Click image to enlarge.)

Remedial Action

DOE remediated the Seymour site from August 1992 to March 1993 as part of FUSRAP. See the Fact Sheet for details.

FUSRAP objectives for the site were to:

- Identify and evaluate all sites used to support former nuclear development activities.
- Remove or otherwise control contamination above current DOE guidelines.
- Achieve and maintain compliance with applicable criteria for the protection of human health and the environment.

Seymour, Connecticut, Site (date unknown).

Post-Remediation Sampling

After each portion of the site was decontaminated, a radiological survey of the area was conducted to confirm that all radioactive contamination above the cleanup criteria had been removed. Survey techniques included transferable and nontransferable contamination measurements, gamma walkover scans, external gamma radiation exposure rate measurements, and soil sampling.

Some contamination above DOE guidelines remains in approximately 165 meters of pipe in the foundation of the first floor and three maintenance holes (referred to as "manholes" in the certification docket). This contamination is nontransferable and was determined to be resistant to all but the most aggressive decontamination techniques. The maintenance holes were not decontaminated because their structural integrity would have been compromised. Exposure rates were measured throughout the Rufert Building to ensure that the DOE basic dose limit of 100 millirem per year (mrem/yr) above background would not be exceeded by a member of the general public. The reasonable maximum exposure scenario at the Rufert Building was calculated to be 12 mrem/yr, approximately 12% of the DOE limit. The maximum exposure rate, 5.8 microroentgen per hour (µR/h), was also well below the DOE guideline for the average level of gamma radiation inside a building that has no radiological restrictions on its use (20 µR/h above background).

For more detailed results of the post-remediation sampling, please see the Site Certification Data Summary Worksheet on pages 4-6. For a more detailed map of the site and sampling locations, please see the Site Overview Map on page 7.

Because the remedial activities at the Seymour site took place before October 1997, residual contamination guidelines from DOE Order 5400.5, *Radiation Protection of the Public and the Environment*, were met. Sites remediated after October 1997 must meet the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq.), as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300).

Current Site Conditions

Post-remedial action surveys have shown, and DOE has certified, that the remediated site is in compliance with DOE standards and criteria. An independent radiological verification survey also verified that the residual uranium contamination at the Seymour site is below FUSRAP guidelines for unrestricted use.

DOE has been responsible for long-term stewardship of the Seymour site since 1993. The stewardship requirements and protocols are captured in the Long-Term Stewardship Plan for Completed FUSRAP Sites, which is available on the DOE Office of Legacy Management website (www.energy.gov/lm/seymour-connecticut-site).

Seymour, Connecticut, Site (August 2010).

ADDITIONAL INFORMATION

Documents related to FUSRAP activities at the Seymour, Connecticut, Site are available on the LM website at lmpublicsearch.lm.doe.gov/SitePages/default.aspx?sitename=Seymour.

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

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Seymour, Connecticut, Site Certification Data Summary Worksheet

Three tables and one memo in the Seymour Certification Docket provide the evidence used to certify the site as clean.

When the tables refer to the "Certification Docket," that is the "Certification Docket for the Remedial Action Performed at the Seymour Specialty Wire Site in Seymour, Connecticut, 1992-1993" (dated December 1995).
When the tables refer to the "Post-Remedial Action Report," that is the "Post-Remedial Action Report for the Removal Action at the Seymour Specialty Wire Site, Seymour, Connecticut" (dated January 1994). This report is included in the Certification Docket.

Summary of Post-Remedial Action Gamma Radiation Exposure Rates

Table 4-3 in Certification Docket (page 60 in the Post-Remedial Action Report)

Room or Area	Exposure Rate[a] Range (µR/h)[b]	Number of Measurements	Number Exceeding Criteria
Room 1	10.7 - 13.0	16	0
Room 2	12.8	1	0
Room 3	11.3 - 11.8	2	0
Room 4	12.0	1	0
Room 5	8.0 - 12.2	30	0
Room 6	10.4 - 12.2	12	0
Room 9	15.1	1	0
Upstairs south lab, Room 13	10.9 - 11.6	3	0
Boiler Room	14.2	1	0
Outside Area 1	10.7 - 15[c]	16	0
Outside Area 2	10.6 - 13.5[c]	6	0

NOTE: *Guidelines for residual contamination come from Table I-1 on page I-9 of the Certification Docket (also Table 2-1 on page 15 of the Post-Remedial Action Report)*
[a]Gamma radiation exposure rates include background, which is approximately 9.3 µR/h for the Seymour area.
[b]The DOE guideline for average exposure rates inside a building or habitable structure is 20 µR/h above background.
[c]Exposure rates were derived by converting walkover gamma scan data. Background was 10.9 µR/h for these measurements.

Soil Cleanup at the Seymour, Connecticut, Site (Exterior Areas of Excavation)

From a U.S. Department of Energy memo from James W. Wagoner II to L. Price, 21 December 1992 (page II-3 of the Certification Docket)

	Excavated Area	Excavated Depth	Post-Excavation Maximum U-238 Concentration[b]
Area 1	10 m^2	6 in	7 pCi/g[a]
Area 2	2 m^2	6 in	7 pCi/g[a]

[a]Includes background level of 0.8 pCi/g
[b]A site-specific U-238 guideline was not developed for the Seymour Site, because exterior soil contamination was not expected. However, during characterization activities completed during remediation, two small exterior areas were found to be contaminated and were remediated. For FUSRAP sites, the U-238 guideline ranges between 50 and 200 pCi/g. The U-238 concentrations at these two small sites were significantly lower than the guideline. See page I-8 of the Certification Docket.

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Seymour, Connecticut, Site Certification Data Summary Worksheet

Summary of Post-Remedial Action Survey Results in Manholes and Pipes					
Table 4-2 in Certification Docket (page 59 in the Post-Remedial Action Report)					
		Direct Beta/Gamma Surface Contamination			
		Sample Activity Range (dpm/100 cm^2)			
Room	**Location[a]**	**Minimum**	**Maximum[d]**	**Number of Measurements**	**Number of Measurements Exceeding Criteria[b]**
Room 5	Manhole 2, 1:00 pipe	11,412	201,448	50	50
	Manhole 3, 6:00 pipe	2,330	60,896	44	30
	Manhole 3, 12:00 pipe	3,844	28,353	26	25
	Manhole 3	18,784	1,180,623	9	9
	Manhole 2, 8:00 pipe	529	150,538	47	21
	Manhole 1, 9:00 pipe	<881	25,953	6	4
	Pipe F on pedestal	1,979	49,413	10	6
	Discharge pipe from floor drain on pedestal	<1,010	14,626	32	12
Room 6	Drain 6	<820	880	29	0
	Drain 10	8,174	68,805	10	10
Room 12	Manhole 4	<872	2,786	20	0
	Manhole 4, after drain decontamination[c]	2,436	4,230	5	0
Guideline			15,000		

NOTE: *Guidelines for residual contamination come from Table I-1 on page I-9 of the Certification Docket (also Table 2-1 on page 15 of the Post-Remedial Action Report)*

[a]The pipe designators refer to the pipe location with the north direction corresponding to 12:00.

[b]Refer to Table 2-1 and Figure 4-8 in the Certification Docket.

[c]Five samples were also collected to determine whether transferable alpha contamination was present; sample activity ranged from <48 to 107 dpm/100 cm^2.

[d]Some radioactive contamination above DOE guidelines remains in manholes and piping. The contamination is nontransferable and extremely resistant to all decontamination efforts. A hazard assessment was performed to define risk for current and future workers. The calculated dose to both current and future workers was determined to be significantly lower than the DOE guideline for protection of the general public (100mrem/yr above background). See page 41 of the Post-Remedial Action Report.

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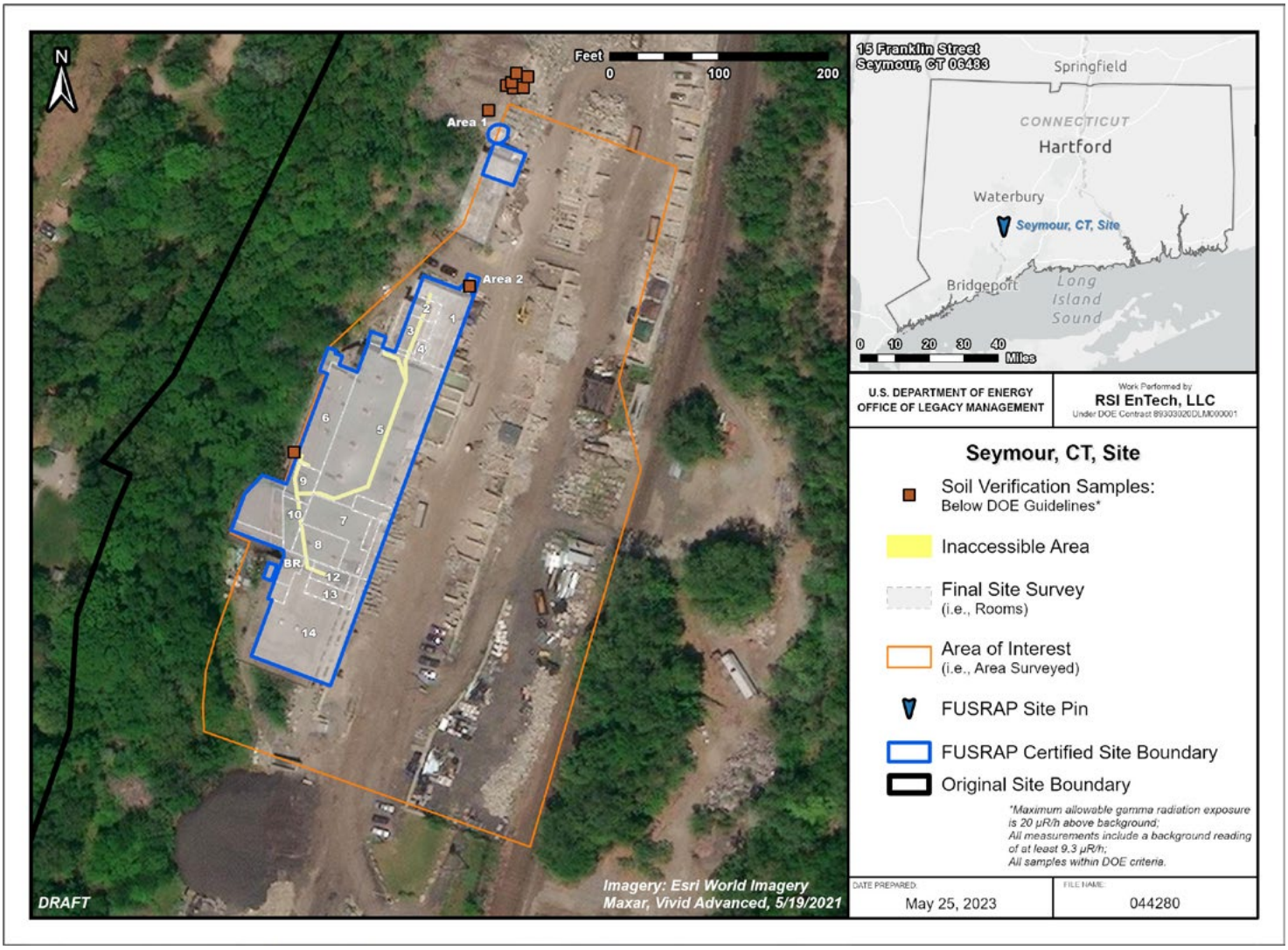
Seymour, Connecticut, Site Certification Data Summary Worksheet

Summary of Post-Remedial Action Radiological Survey Results for the Rufert Building									
Table 4-1 in Certification Docket (pages 57 and 58 in the Post-Remedial Action Report)									
		Direct Surface Contamination				Transferable Contamination			
		Alpha		Beta/Gamma		Beta/Gamma			
Room	Location	Sample Activity Range (dpm/100 cm^2)	Number of Measurements[a]	Sample Activity Range (dpm/100 cm^2)	Number of Measurements[a]	Sample Activity Range (dpm/100 cm^2)		Number of Measurements[a]	
Room 1	Overhead trusses	<19 - 190	407	<447 - 686	410	<48 - <91		2	
	Overhead beams	<21 - 90	57	<412 - 1,022	57	<76		1	
	Ducts	<24 - 88	51	<412 - 773	51	—		—	
	Overhead pipes	<24 - 245	57	<412 - 2,394	57	<44 - 69		9	
	Fans	<21 - 49	6	<412 - 517	6	—		—	
	Lights	<16 - 116	61	<469 - 1,427	61	<72 - 88		3	
	Walls	< 16 - 163	190	<694 - 2,924	190	<44 - 51		39	
	Floor	<24 - 265	426	<599 - 1,752	426	<44 - <92		50	
	North porch	<21 - 107	5	<556 - 1,092	5	< 59		1	
Room 2	Lights	<22 - 147	168	<402 - 1,972	168	46 - 119		103	
	Venetian blinds	<22 - 53	18	<402 - 689	18	<86 - <102		3	
	Walls	<16 - 152	53	<480 - 1,599	53	<52 - <77		12	
	Floor	<11 - 342	92	<353 - 3,701	92	<52 - <56		6	
Room 3	Beams	<13 - 75	221	<379 - 665	221	<52 - <95		4	
	Ducts	<13 - 75	36	<379 - 785	36	<52 - <90		2	
	Overhead pipes	<13 - 106	98	<379 - 1,226	98	<52 - 82		16	
	Lights	<11 - 64	39	<354 - 1,360	39	<53 - <95		9	
	Floor	<20 - 136	72	<498 - 2,558	72	<101		1	
Room 4	Floor	<11 - 106	28	<418 - 837	28	< 50		1	
Room 5	Trusses	<16 - 705	1,107	<493 - 1,335	1,107	<46 - <73		4	
	Overhead pipes	<29 - 99	620	<515 - 1,747	620	<44 - 140		121	
	Ducts	<29 - 59	116	<523 - 1,228	116	<46 - 76		5	
	Lights	<33 - 87	196	<465 - 3,495	196	<44 - 76		21	
	Heater	<29 - <72	11	<649 - <702	11	—		—	
	Floor	<13 - 166	2,047	<420 - 2,484	2,047	<47 - 89		104	
Room 6	Trusses	<19 - 157	384	<560 - 785	384	<46		1	
	Beams	<21 - 423	98	<426 - 2,394	98	<46 - <93		13	
	Overhead pipes	<24 - 245	97	<575 - 1,026	97	<64		1	
	Fans	<21 - 382	6	<426 - 866	6	—		—	
	Ventilation duct	37 - 343	40	<452 - 3,631	40	<53 - 55		31	
	Floor	<21 - 266	486	<517 - 1,443	486	<46 - <78		15	
Upstairs Lab	Hall floor	<39 - <69	24	<453 - 1,378	24	<77 - <93		2	
	Floor drains	—	—	<382 - 449	30	—		—	
	Floor around drains	<51	24	<513	24	—		—	
	Floor drain pipe	—	—	—	—	alpha	beta/gamma	alpha	beta/gamma
						<3 - 13	<53 - <108	10	10
Boiler Room	Pipes	<28 - 35	22	<336 - 1,711	22	alpha	beta/gamma	alpha	beta/gamma
						<3 - 6	<52 - <111	22	22
	Lights	<11 - 16	12	<420 - 1,591	12	alpha	beta/gamma	alpha	beta/gamma
						<3 - 6	<53 - 67	9	9
Guidelines		5000		5000		1000	1000		

NOTE: *Guidelines for residual contamination come from Table I-1 on page I-9 of the Certification Docket (also Table 2-1 on page 15 of the Post-Remedial Action Report)*
[a]No measurements exceeded the allowable surface residual contamination criteria.

Seymour, Connecticut, Site Map



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