Managing FUSRAP Ineligible Sites - 22036

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ABSTRACT

The US Department of Energy (DOE) Office of Legacy Management (LM) has long-term management responsibility for sites remediated under numerous regulatory regimes, including the Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP was established by the US Atomic Energy Commission (AEC) to address residual radioactive contamination resulting from historic Manhattan Engineer District (MED) and AEC activities. LM is responsible for determining whether sites are eligible for FUSRAP and, if eligible, for referring the sites to the US Army Corps of Engineers (USACE) for additional investigation. If warranted, USACE designates the sites for remediation. A few sites that were determined to be ineligible were later designated for remediation by Congress. After a site is designated, USACE completes remediation and transfers the completed site back to LM for records management and post-closure care.

Since FUSRAP's inception in 1974, hundreds of sites have been determined to be ineligible by DOE and its predecessor agencies, AEC and the US Energy Research and Development Administration. LM maintains documentation supporting these eligibility determinations, including a collection of documents called the Considered Sites Library (CSL) that was inherited from the DOE Office of Environmental Management when LM was established in 2003. Many sites were originally determined to be ineligible on the basis that little or no risk from residual radioactive contamination existed. Several sites that were ineligible for FUSRAP were referred to other agencies or other remedial action programs with the authority to address them. Today, 55 sites are included in FUSRAP. Of these, 34 are completed, with most remediated for unrestricted use.

In recent years, LM conducted a comprehensive review of the CSL and other document collections that were used as a basis for original ineligibility decisions. LM's review provided the opportunity to identify any new information that may have become available and, more importantly, to reevaluate the potential risk to human health or the environment from residual radioactive contamination at some ineligible sites.

LM's comprehensive review began with the creation of a Master Site List (MSL) that compiled information from numerous lists generated by DOE and other sources on all sites with past associations with DOE or its predecessor agencies. During the comprehensive review, each site on the MSL was evaluated according to a stepwise screening process based in part on eligibility criteria and in part on risk-related data such as area population density and land use. Between 2014 and 2021, LM screened 970 sites.

The screening process developed by LM to perform the comprehensive review was later used to create a formal process to evaluate potential new sites and evaluate new information from known ineligible sites as it is discovered. Information on FUSRAP ineligible sites is available on LM's public website through the Considered Sites Database. The database is based on the CSL and contains information about FUSRAP ineligible sites, completed sites, and sites currently being remediated by USACE.

The comprehensive review identified 24 sites that required further evaluation. The follow-up research determined that, with respect to MED- or AEC-related contamination, no unaddressed risks to human health or the environment remain at these ineligible sites. The review also found no evidence of any site

not previously identified. The most important benefit of this review is the reaffirmation that residual radiological contamination has been addressed at FUSRAP ineligible sites, and no significant risks to human health or the environment remain unaddressed. Other benefits include improvements in LM's ability to quickly locate information to satisfy stakeholder inquiries and enhanced support of the FUSRAP eligibility and referral process.

INTRODUCTION AND BACKGROUND TO FUSRAP

The US Department of Energy (DOE) Office of Legacy Management (LM) has long-term management responsibility for sites remediated under numerous regulatory regimes, including the Formerly Utilized Sites Remedial Action Program (FUSRAP) [1]. Various regulatory programs were established to address residual radioactive contamination at sites that supported the activities of DOE and its predecessors, the Manhattan Engineer District (MED), the US Atomic Energy Commission (AEC), and the US Energy Research and Development Administration (ERDA). When the US Nuclear Regulatory Commission was established in 1975, it assumed licensing and regulatory responsibilities from AEC. ERDA assumed other AEC responsibilities, including FUSRAP, and in 1977 these became the responsibility of DOE when it was formed from ERDA and related agencies.

AEC established FUSRAP in 1974 to identify and address residual radioactive contamination from historic MED and AEC activities that was not being addressed [2]. In 1997, Congress reassigned the responsibility to characterize, designate, and remediate eligible sites to the US Army Corps of Engineers (USACE) [3]. DOE retains the responsibility to determine if sites are eligible for FUSRAP and for long-term care of remediated sites. Congress directed USACE to perform remediation using the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. Figure 1 summarizes the current FUSRAP framework [4]. If a site is eligible, LM refers it to USACE. USACE then performs additional research that may include site characterization and, if warranted, USACE designates the site for remediation. Congress may also designate a site if it is not otherwise eligible. After remediation is complete, and after a 2-year monitoring period, completed sites are transferred from USACE to LM for records management and, if needed, post-closure care.

Not all sites determined to be eligible by DOE are designated for remediation or referred by Congress. For example, if a site has MED- or AEC-related contamination that is inaccessible under the current land use or if the extent of contamination does not warrant a CERCLA response, the site will not be designated for FUSRAP. Under authority of the Atomic Energy Act of 1954, DOE may be able to address such sites as MED/AEC legacy sites or, if there is no significant risk to human health or the environment, they may be managed as records-only, inactive sites.

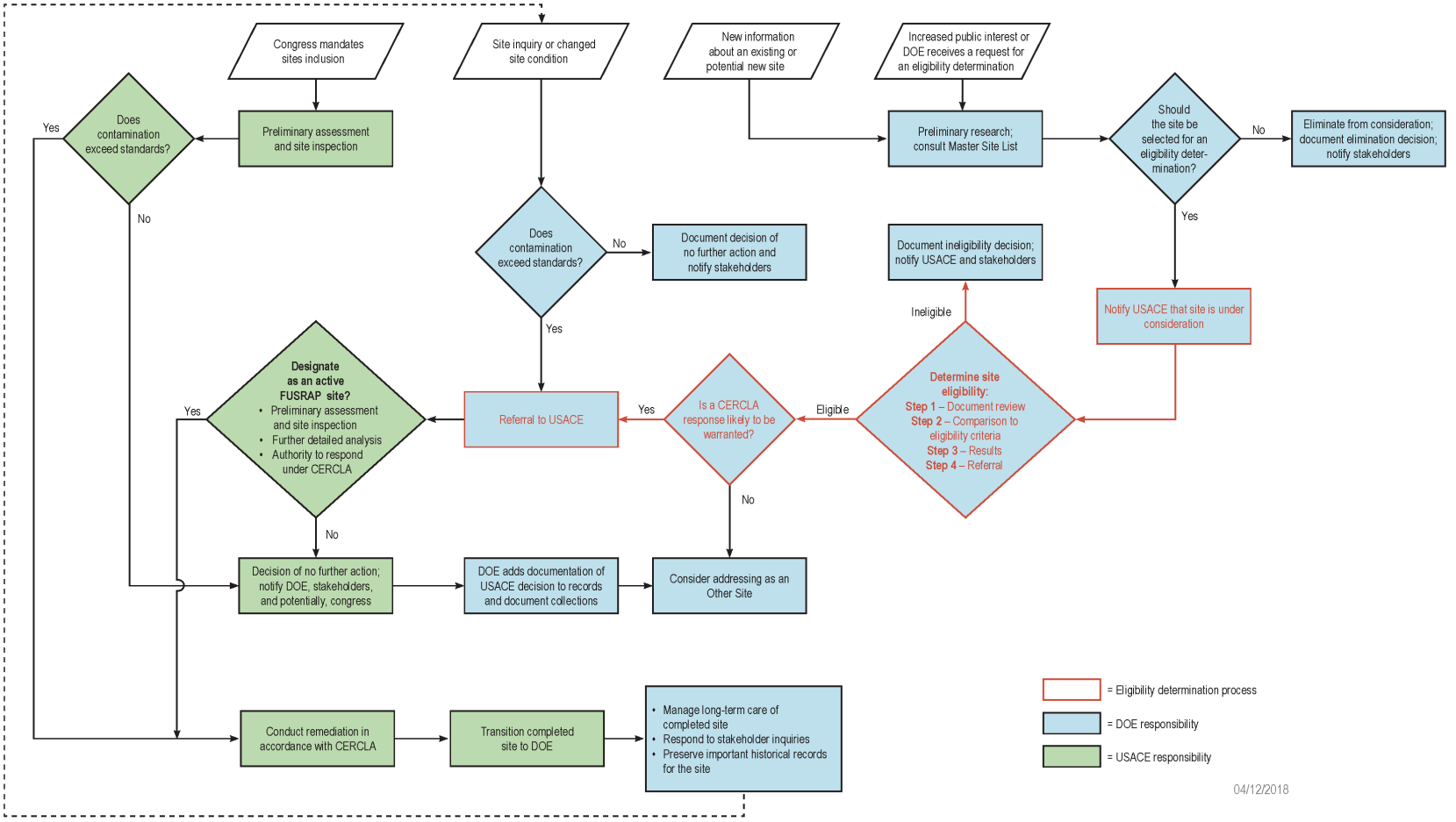


Figure 1. Overview of the FUSRAP Framework

Since FUSRAP's inception, hundreds of sites have been evaluated and determined to be ineligible for the program by DOE and its predecessor agencies, AEC and ERDA. There are many specific reasons a site can be determined to be ineligible. However, all eligible sites must meet the four eligibility criteria listed below [4].

FUSRAP Eligibility Criteria
1 – A site must have conducted work in support of MED or AEC activities,
2 – There is a reasonable, credible expectation that the activities resulted in residual radioactive contamination above current guidelines,
3 – The site is not subject to remediation under another program, nor is it licensed, and
4 – The authority to request appropriations for remediation is prescribed in existing legislation.

During the original eligibility determinations in the late 1970s and early 1980s, a list was compiled of sites to be evaluated. If a site was referenced in an MED or AEC document or record, it was considered a potential FUSRAP site and assigned a unique identifier. LM maintains documentation supporting the eligibility determinations, including a collection of documents called the Considered Sites Library (CSL) that LM inherited from the DOE Office of Environmental Management (EM) when LM was established in 2003. Many sites were determined to be ineligible because little or no risk from residual radioactive contamination existed. Many sites that were potentially radiologically contaminated but ineligible for FUSRAP were referred to other agencies or remedial action programs with the authority to address them.

Since LM was formed in 2003, it has referred several sites to USACE for evaluation or additional remediation. LM has also performed eligibility determinations for several sites that were not ultimately referred to USACE because they did not meet one or more eligibility criteria. Today, 55 sites are included in FUSRAP. Of these, 34 are completed, with most remediated for unrestricted use.

COMPREHENSIVE REVIEW OF INELIGIBLE SITES

LM manages information on FUSRAP ineligible sites in accordance with its strategic goals of protecting human health and the environment and preserving, protecting, and sharing records and information [5]. LM wants to ensure that protective controls are in place for all sites contaminated by MED- or AEC-related activities. In recent years, LM conducted a comprehensive review of the CSL, other document collections, and publicly available online information. The review sought to identify new information that may have become available since the original eligibility decisions were made. More importantly, the review provided an opportunity to reevaluate potential risk to human health or the environment from residual radioactive contamination that may remain at some ineligible sites. The comprehensive review began in 2014 [6] and continues regularly as new site information is discovered.

THE MASTER SITE LIST

LM's comprehensive review began in 2014 with the creation of a Master Site List (MSL). The list contains information on CSL sites and on other sites associated with DOE or its predecessor agencies. LM continues to maintain this list and update it annually. For a variety of reasons, site names have changed over time, and names may differ between source lists. The MSL compares names among the source lists, and it also accounts for duplicate or redundant names associated with individual sites.

The MSL compiles information from 12 current and historical lists generated by DOE and other sources. The 12 source lists are shown in Table 1. Source lists were added to the MSL over time. In 2014, the MSL contained 677 sites, most of which were found in the CSL. After the most recent update in 2021 and after duplicate names were resolved, the MSL had expanded to 970 sites related to DOE. Most of the nearly 300 sites added between 2014 and 2021 were not potentially eligible for FUSRAP, nor were they associated with FUSRAP eligibility determinations. However, they were included in the list to assist in answering potential questions from stakeholders.

SITE SCREENING AND PRESCREENING PROCESS

During LM's comprehensive review, each site on the MSL was evaluated according to a screening process. LM developed the process in spring 2014 to screen 677 sites, most of which were in the CSL [15]. Additional sites not in the CSL but associated with DOE were screened in subsequent years as they were added to the MSL. In 2018, LM modified the screening process into a formal prescreening procedure used to evaluate potential new sites as they are discovered [16].

LM occasionally receives information about a potential new site. After LM consults the MSL to confirm that the site is new and not an alias of a known site, it is prescreened according to the steps in Figure 2. This prescreening process also applies when new information has been received for a site that has previously been determined to be ineligible for FUSRAP. At some point in the prescreening process, it might become clear that the site is not eligible for FUSRAP because (1) no records are available for the site from which LM could conduct a meaningful evaluation, (2) the site has been addressed by another cleanup program, (3) there is no evidence of radiological contamination above current guidelines, or (4) there is evidence that the site was never connected to MED or AEC. Such sites are not eligible, and they are removed from further screening. All other sites continue through the prescreening process, which could result in a formal determination of eligibility, depending on the results of the process.

Table 1. Source Lists for LM's Master Site List

Source	Description
LM *Site Management Guide* [7]	Lists all current LM sites and those expected to transition to LM in the future. The *Site Management Guide* is found on LM's public website and is updated regularly. (The MSL also includes sites managed by LM but not in the *Site Management Guide*—e.g., calibration facilities.)
FUSRAP site list	A list of completed, active and referred FUSRAP sites, including those listed online in USACE program updates.
FUSRAP Considered Sites Library	Sites that were assigned a unique identifier by original FUSRAP eligibility researchers.
Office of Environmental Management [8]	Interactive webpages for sites historically and currently undergoing remediation by DOE EM.
EEOICPA sites [9]	Sites listed in the Energy Employees Occupational Illness Compensation Program Act of 2000 (EEOICPA) as amended by subsequent *Federal Register* notices.
NDAA Report to Congress [10]	National Defense Authorization Act (NDAA) report, January 2001: *A Report to Congress on Long-Term Stewardship*. Outlines DOE EM's existing and anticipated long-term stewardship obligations as of 2001.
BEMR [11]	1996 DOE EM Baseline Environmental Management Report (BEMR), Volumes 1–3, and 1995 report, *Estimating the Cold War Mortgage*.
NRC-listed sites	Sites listed on the US Nuclear Regulatory Commission's (NRC's) historic Site Decommissioning Management Program lists and historic and current complex decommissioning site lists.
Potential Nuclear Waste Policy Act Section 151(b) sites	Sites identified in historic correspondence between DOE and NRC that, at some point in time, had been expected to require long-term care.
Joint Convention sites [12]	Sites listed in national reports for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. DOE, in cooperation with NRC, the US Environmental Protection Agency, and the US Department of State, regularly publish a Joint Convention report, which includes many sites associated with DOE.
Wall Street Journal [13]	In articles and investigations, major media sources have listed sites associated with FUSRAP and/or DOE. These lists are included because they are or were highly visible to the public.
USA Today [14]	

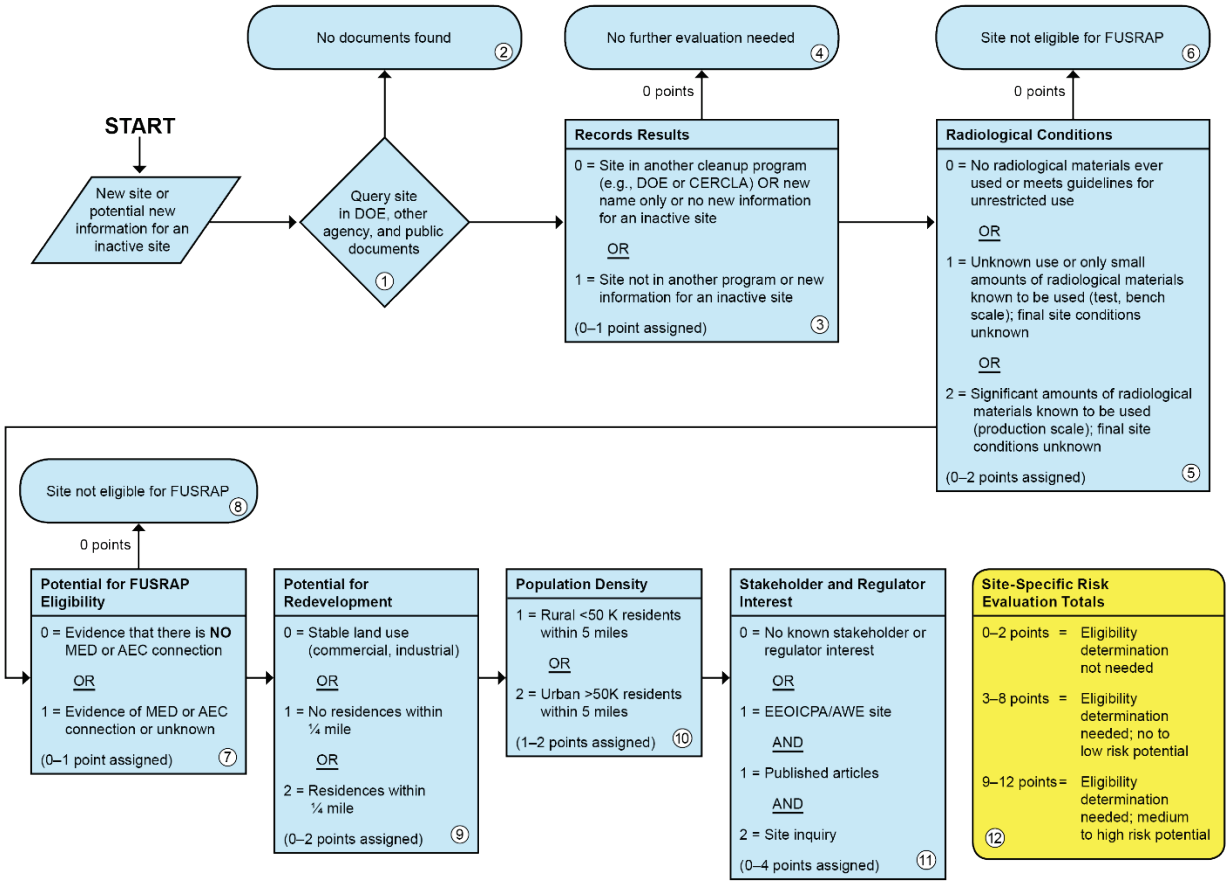


Figure 2. LM's Prescreening Process for Potential New Sites or for New Information on Known Sites [16]

The prescreening process is a stepwise approach based in part on the FUSRAP eligibility criteria, but it also factors in risk-related data such as population density and land use. Details of each step in the prescreening process are described below.

Step 1: *Query site in DOE, other agency, and public documents*
LM performs research to gather as much information about the site as possible from DOE records, document collections, other agency documents, and publicly available online information.

> Step 2: *No documents found*
> If no documents upon which to conduct a meaningful evaluation are found during Step 1, the site is determined to be ineligible for FUSRAP, and no further screening is needed.

If documentation exists from which a meaningful evaluation can be conducted, the site is assigned 1 point and progresses to Step 3.

Step 3: *Records results*
Information found during the records query in Step 1 is compiled and evaluated. If radioactive contamination at the site is already being addressed by another cleanup program, the site is assigned no

points and progresses to Step 4. If new information on an existing site is not sufficient to impact the original eligibility determination, it is also assigned no points and progresses to Step 4.

> Step 4: *No further evaluation needed*
> If the site is in another cleanup program or there is no substantial new information for an inactive site that has previously been evaluated for FUSRAP, the site is determined not to be eligible, and no further screening is needed.

If radioactive contamination at the site is not fully addressed by another cleanup program or if new information is substantial (for example, if previously unknown contamination is discovered), the site is assigned 1 point and progresses to Step 5.

Step 5: *Radiological conditions*
Based on information from existing documents reviewed in Step 1, if there is no evidence that radioactive materials were ever used at a site or if it was verified to meet current cleanup guidelines for radioactivity, the site is assigned no points and progresses to Step 6.

> Step 6: *Site not eligible for FUSRAP*
> If a site is not radioactively contaminated, it is not eligible for FUSRAP, and no further screening or eligibility determination is needed.

If site conditions are unknown but only small amounts of radioactive materials are suspected to have been used at a site, it is assigned 1 point and progresses to Step 7.

If site conditions are unknown and large amounts of radioactive materials are suspected to have been used at a site, it is assigned 2 points and progresses to Step 7.

Sites known to be radioactively contaminated above guidelines are assigned 2 points and progress to Step 7.

Step 7: *Potential for FUSRAP eligibility*
If there is evidence that the site has no connection to MED or AEC, it is assigned no points and progresses to Step 8.

> Step 8: *Site not eligible for FUSRAP*
> If there is evidence that a site has no MED or AEC connection, it is not eligible for FUSRAP, and no further screening or eligibility determination is needed.

If a connection to MED or AEC cannot be ruled out or if the site has a known connection, it is assigned 1 point and progresses to Step 9.

Step 9: *Potential for redevelopment*
A site's potential for redevelopment is factored in to ensure that an eligibility determination is performed for any site with higher risk. At this step, 0 points are assigned if the land use is commercial or industrial and stable (i.e., guidelines for commercial or industrial use would apply). Sites where unconditional release guidelines may apply but with no residences within 0.25 mile are assigned 1 point, and 2 points are assigned to sites with residences within 0.25 mile. All sites progress to Step 10.

Step 10: *Population density*
The population density in the vicinity of a site is factored in to ensure that an eligibility determination is performed for any site with higher risk. At this step, 1 point is assigned to rural sites, and 2 points are assigned to urban sites. All sites will progress to Step 11.

Step 11: *Stakeholder and regulator interest*
Regardless of risk, LM factors in stakeholder or regulator interest to be responsive to public concerns. At this step, a site receives no additional points if there is no apparent interest from stakeholders or regulators. Sites listed on EEOICPA lists or Atomic Weapons Employer lists are assigned 1 point. Those sites included in published articles are assigned 1 additional point. If a site inquiry has been made to LM, 2 additional points are assigned. A site may be assigned up to 4 points at this step.

The site-specific risk evaluation totals are tallied from scores assigned in previous steps. Eligibility determinations are not appropriate for sites with up to 2 points. LM will perform eligibility determinations for sites with 3 points or more, and sites with 9 points or more are considered to have medium- to high-risk potential.

RESULTS OF COMPREHENSIVE REVIEWS

Initial screening in 2014 identified 24 sites that were believed to have medium risk potential [15]. Through additional research in subsequent years, LM was able to conclude that 20 of these sites did not present risk. For example, they had been remediated by another agency after being determined ineligible for FUSRAP, they were demolished, or they were planned but never constructed. The 4 remaining sites were further evaluated and determined not to present any significant risk to human health or the environment. For example, small areas of low-level radioactive contamination were suspected, but they were inaccessible.

A total of 970 sites from the MSL were screened between 2014 and 2021. During each evaluation year, sites newly added to the MSL were fully screened, and sites that had been previously screened were only rescreened if new information had become available. Table 2 summarizes results from the 2021 screening.

Table 2. Results of 2021 FUSRAP Ineligible Site Screening

Category	Description	Number of Sites
DOE sites (includes LM, DOE EM, and other DOE offices)	Sites in FUSRAP or other DOE programs are not subject to screening because contamination has been or is being addressed. This category includes non-DOE sites remediated by DOE.	218
Site does not exist	The site name or identifier is the result of a clerical error, or a site was planned but never constructed.	8
No site information	After extensive research, no information was found from which to conduct a meaningful evaluation.	13
Facility has been demolished	Sites with low potential for radiological contamination that have been demolished or significantly remodeled. These sites cannot be assessed because the facilities that supported MED or AEC no longer exist.	26
Eligibility basis for FUSRAP:		
Criterion 1: No evidence of MED or AEC involvement	No evidence that work was performed at the site in support of MED or AEC activities. Privately operations that only supplied materials to MED or AEC are included here.	22
Criterion 2: Not radiologically contaminated	Sites with documentation showing that no radioactive materials were used, or sites that were verified to meet current guidelines for radiological conditions.	179
Criterion 2: Limited potential for radioactive contamination	Sites originally determined to be ineligible because MED and AEC activities could not have resulted in significant contamination. After reevaluation, it was determined that this basis is still valid.	85
Criterion 2: Phosphate plants	Plants that do not meet current guidelines for radioactivity but that were surveyed and determined to be consistent with background levels present in phosphate plants that did not perform work for MED or AEC.	7
Criterion 3: Other remedial action program sites	Sites referred to other agencies or remedial action programs. Follow-up research determined that these sites have been remediated or are being remediated.	145
Criterion 3: Licensed sites	AEC-, NRC- or State-licensed sites that have been remediated, are being remediated, or remediation status is unknown.	210
Criterion 3: State request	Sites that were excluded from remediation under the Uranium Mill Tailings Radiation Control Act program at the State's request.	2
Criterion 4: No authority (DOD)	Remedial action is the responsibility of the US Department of Defense (DOD).	51
Screened sites identified as medium-risk sites	Sites identified as potentially eligible for FUSRAP, but follow-up evaluations found no evidence of risk from residual radioactive contamination.	4
		Total: 970

In 2014, 51 sites could not be screened because no information was available from which to conduct a meaningful evaluation. By 2021, researchers had discovered new information on many sites and reduced this number to 13. Annual updates to the MSL continue to look for available information. It must be noted that, because so few records exist, it is unlikely that any of these sites were involved with radioactive materials work for MED or AEC.

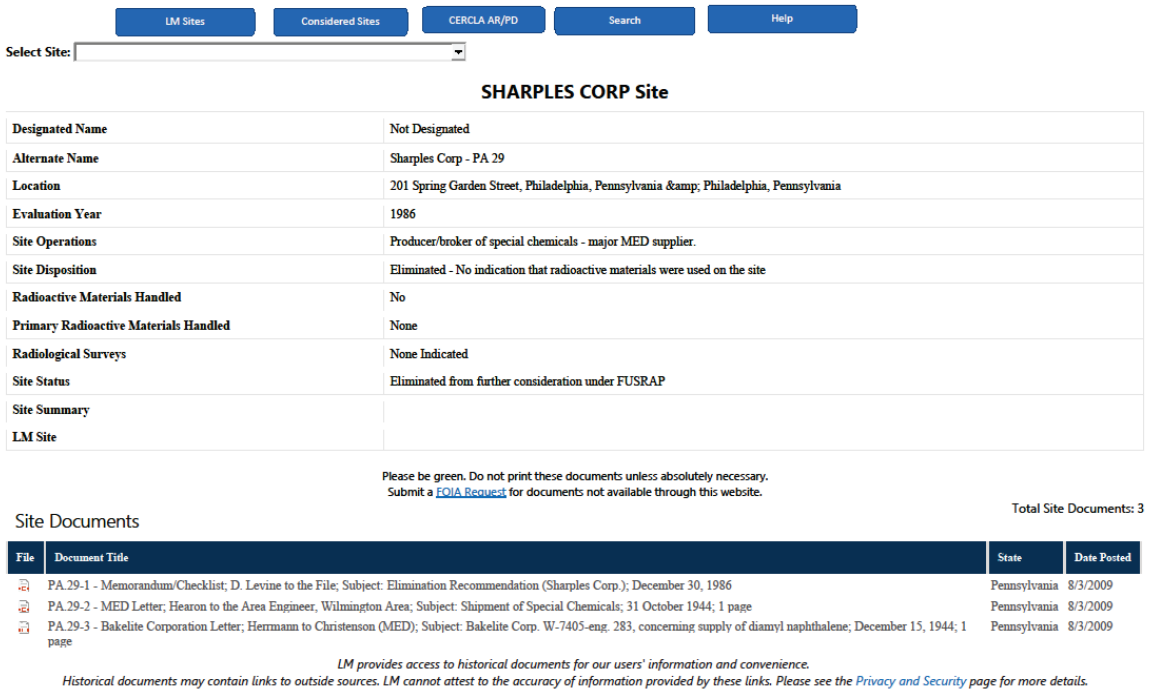
THE CONSIDERED SITES DATABASE

The CSL contains the bulk of documents related to FUSRAP eligibility determinations made over several decades, beginning with DOE predecessor agencies in the 1970s. CSL documents include contracts, operational records, and other records that supported MED and AEC work. They also include health and safety documents, radiological surveys, completion reports, and other evidence related to the use of radioactive materials at sites evaluated for FUSRAP.

In the fall of 2000, a series of articles by *USA Today* were published that generated considerable public interest in FUSRAP [14]. At that time, DOE EM initiated e-FUSRAP, which made information available online to the public for over 600 sites in the CSL [17]. This collection of publicly available information is called the Considered Sites Database (CSD).

When DOE EM developed the CSD under the e-FUSRAP initiative between 2000 and 2003, its goals were to (1) enhance the information available to the public through the website, (2) provide consistent summary information to the public for each site, and (3) provide reference documents to the public for information cited in the CSD. These goals were met, and LM continues to maintain the CSD in accordance with them. Information continues to be made available to the public on LM's website at https://www.energy.gov/lm/office-legacy-management (Goal 1). Consistent summary information on each site is presented in the form of metadata tables available on the public website (Goal 2), and reference documents are also provided (Goal 3). Presentation of this information online has evolved over time in response to public inquiries and later media articles, including the *The Wall Street Journal's* article "Waste Lands" in 2014 [13].

Recently, LM transitioned its internet platform from a content management system to a SharePoint file repository. In the process of this transition, the CSD was upgraded, and revisions were made to the public webpages to make them more user-friendly. Figure 3 shows an example of a publicly available webpage for an ineligible site. The site's metadata table is presented above a series of links to reference documents.


LM Sites | Considered Sites | CERCLA AR/PD | Search | Help

Select Site:

SHARPLES CORP Site

Designated Name	Not Designated
Alternate Name	Sharples Corp - PA 29
Location	201 Spring Garden Street, Philadelphia, Pennsylvania & Philadelphia, Pennsylvania
Evaluation Year	1986
Site Operations	Producer/broker of special chemicals - major MED supplier.
Site Disposition	Eliminated - No indication that radioactive materials were used on the site
Radioactive Materials Handled	No
Primary Radioactive Materials Handled	None
Radiological Surveys	None Indicated
Site Status	Eliminated from further consideration under FUSRAP
Site Summary	
LM Site	

Please be green. Do not print these documents unless absolutely necessary.
Submit a FOIA Request for documents not available through this website.

Total Site Documents: 3

Site Documents

File	Document Title	State	Date Posted
	PA.29-1 - Memorandum/Checklist; D. Levine to the File; Subject: Elimination Recommendation (Sharples Corp.); December 30, 1986	Pennsylvania	8/3/2009
	PA.29-2 - MED Letter; Hearon to the Area Engineer, Wilmington Area; Subject: Shipment of Special Chemicals; 31 October 1944; 1 page	Pennsylvania	8/3/2009
	PA.29-3 - Bakelite Corporation Letter; Herrmann to Christenson (MED); Subject: Bakelite Corp. W-7405-eng. 283, concerning supply of diamyl naphthalene; December 15, 1944; 1 page	Pennsylvania	8/3/2009

LM provides access to historical documents for our users' information and convenience.
Historical documents may contain links to outside sources. LM cannot attest to the accuracy of information provided by these links. Please see the Privacy and Security page for more details.

Figure 3. Elements of a Webpage for an Individual Considered Site (i.e., Sharples Corp.)
Note: This figure is not an image of the actual webpage and might not be completely accurate or to scale.

CONCLUSION

LM developed a screening process to ensure that protective controls are still in place for all sites with MED- or AEC-related contamination. The MSL was developed as part of the original screening process, and this list has proved to be a useful tool for responding more quickly to public inquiries on the hundreds of sites associated with DOE. The original screening process was later developed into a prescreening process for any new site that LM may become aware of in the future. The initial review in 2014 identified several sites that required further research, but additional research determined that no risk to human health or the environment remains from MED- or AEC-related contamination at those sites. The review also found no evidence of any site not previously identified or addressed. In all, the site screening process developed by LM has proved to be an excellent tool to help predict programmatic risk and to ensure that all sites remain protective of human health and the environment. The most important benefit of this review is to reaffirm that residual radiological contamination has been addressed at FUSRAP ineligible sites. Other benefits include improvements in LM's ability to quickly locate information to satisfy stakeholder inquiries and enhanced support of the FUSRAP eligibility determination and referral process.

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