Overview of the U.S. Department of Energy Formerly Utilized Sites Remedial Action Program - 12189

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ABSTRACT

The U.S. Department of Energy (DOE) Formerly Utilized Sites Remedial Action Program (FUSRAP) was established in 1974 to address residual radiological contamination at sites where work was performed for the Manhattan Engineer District and U.S. Atomic Energy Commission. Initially, FUSRAP activities began with a records search for sites that had the potential to contain residual radiological contamination; 46 sites were identified that were eligible for and required remediation. Remedial action began in 1979. In 1997, Congress assigned responsibility for the remediation of FUSRAP sites to the U.S. Army Corps of Engineers (USACE). DOE retains responsibility for determining if sites are eligible for FUSRAP remediation and for providing long-term surveillance and maintenance (LTS&M) of remediated FUSRAP sites.

DOE LTS&M activities are designed to ensure that FUSRAP sites remain protective of human health and the environment and to preserve knowledge regarding FUSRAP sites. Additional elements include eligibility determinations, transition of remediated sites from USACE to DOE, LTS&M operations such as inspections and institutional controls management, stakeholder support, preservation of records, and real property and reuse. DOE maintains close coordination with USACE and regulators to ensure there is no loss of protectiveness when sites transition to DOE for LTS&M.

INTRODUCTION

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) provides long-term surveillance and maintenance (LTS&M) support for remediated DOE sites. Of the more than 120 remediated sites that will eventually be assigned to LM for LTS&M, approximately 53 will have been addressed under the Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP was developed to address the residual radiological contamination that remained at sites where the Manhattan Engineer District (MED) and the U.S. Atomic Energy Commission (AEC) performed work during World War II and the Cold War (Figure 1).

Many remediated FUSRAP sites meet criteria that allow for unrestricted use. For those sites, LM activities consist of records management and stakeholder support. At other sites, some residual contamination may remain after remediation and some land uses must be restricted. In these instances, DOE will conduct more “active” LTS&M activities, such as managing institutional controls and performing site inspections or environmental monitoring, to allow the highest beneficial land use while ensuring protectiveness.

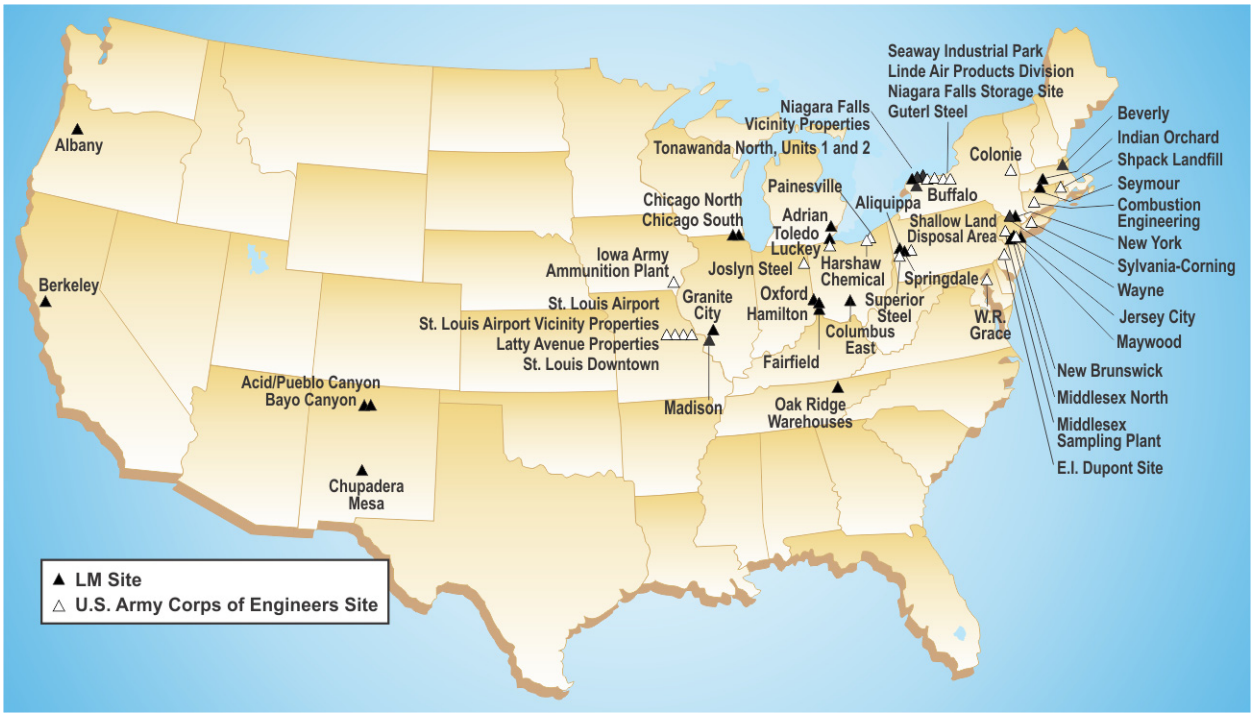

Figure 1. FUSRAP sites.

FUSRAP HISTORY

Legacy Activities: 1942–1973

In August 1942, the U.S. Army directed MED to manage the development of the technology and production facilities for the first atomic weapons. In August 1946, President Truman signed the Atomic Energy Act [1], which created AEC, a civilian agency. Congress abolished MED on January 1, 1947, and transferred the responsibilities for the atomic weapons program to the newly formed AEC. Figure 2 shows a timeline of events that have been significant to the federal nuclear weapons and nuclear energy programs, including those relevant to FUSRAP.

Into the 1960s, MED and then AEC employed contractors at many sites throughout the United States to supply materials and services. Activities included processing and storing uranium and thorium ores and other radioactive materials for the nuclear weapons program, performing metallurgical research, and providing production and machining services. Although most of the sites were cleaned up to guidelines that were in effect at the time, more stringent standards have been put into effect since then. AEC identified the need to reexamine the sites in the early 1970s to evaluate potential risks to human health and the environmental where levels of radioactive contamination might exceed the revised standards.

Creation of FUSRAP and LM: 1974–2003

In 1977 DOE assumed the responsibilities of AEC,[1] including the administration and execution of FUSRAP. AEC's and DOE's initial task was to identify potential FUSRAP sites for cleanup. After reviewing records and radiometric surveys for more than 600 sites connected with the nuclear weapons program, 46 sites were identified that required cleanup. Limited cleanup began in 1979, and major remedial activities were

[1] FUSRAP was also administered by the Energy Research and Development Administration from 1975, when AEC was reorganized, until 1977, when DOE was established.

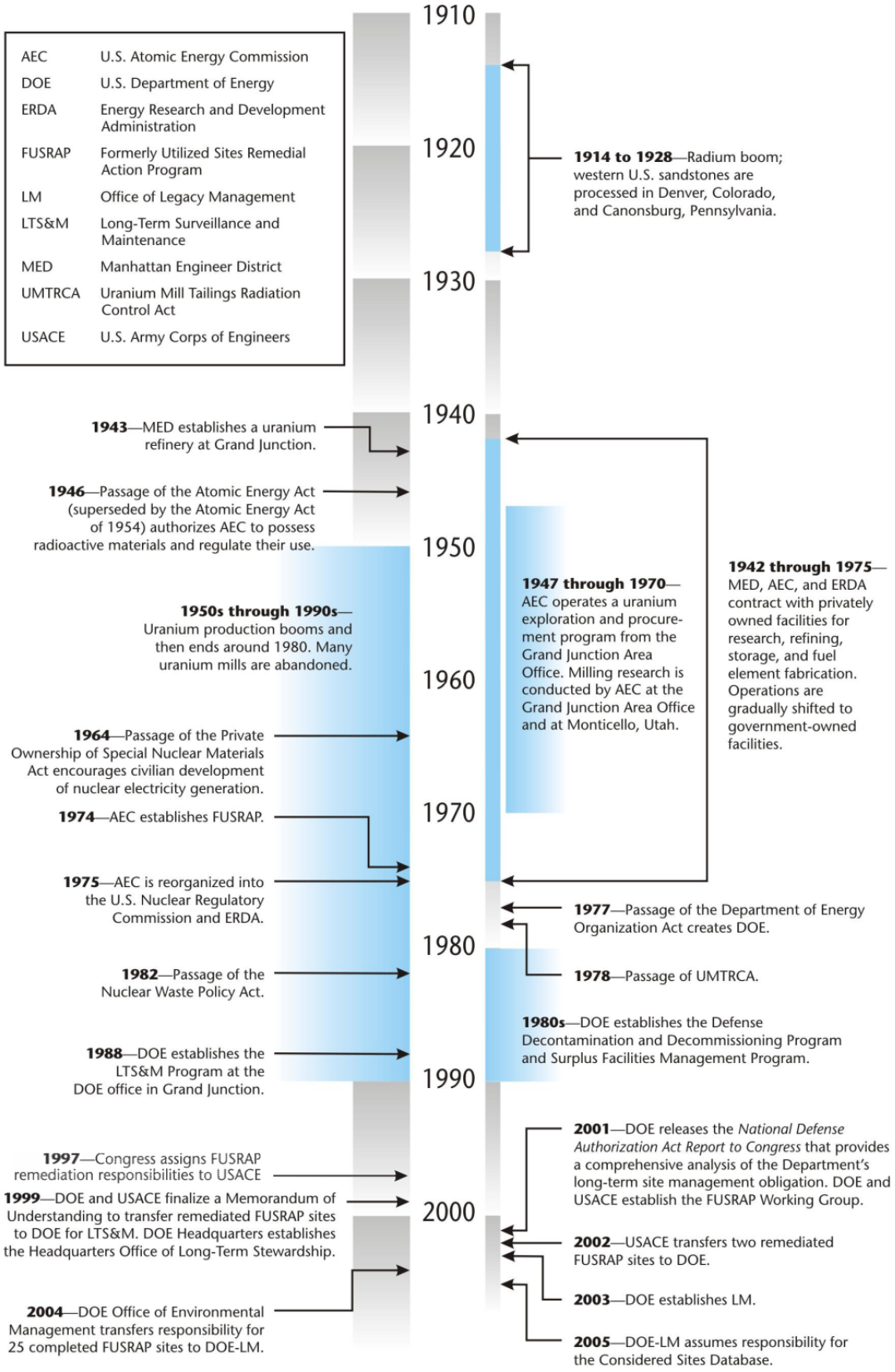

Figure 2. Chronology of events in the federal nuclear weapons and nuclear energy programs.

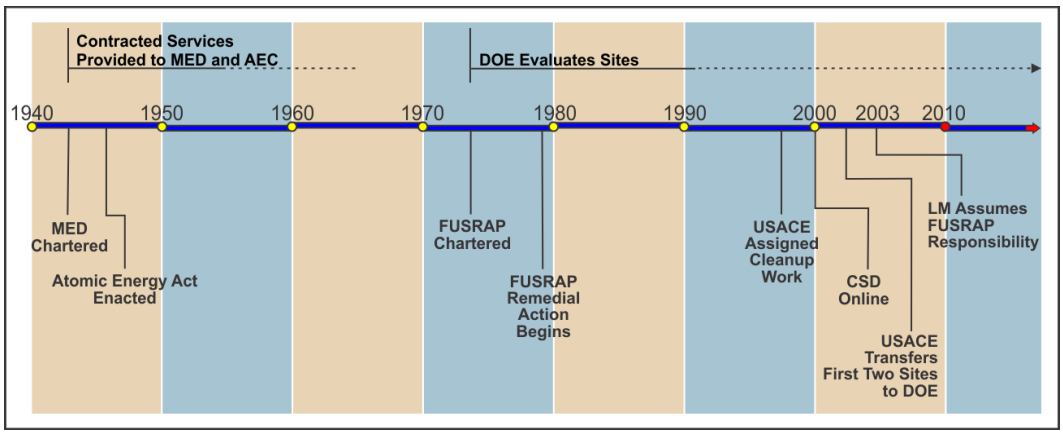

Figure 3. Timeline of evaluation and remediation of former MED/AEC sites under FUSRAP.

underway by early 1981. Between 1981 and 1997, DOE remediated 25 of the 46 sites (Figure 3).

In 1997, Congress transferred responsibility for FUSRAP site characterization and remediation to the U.S. Army Corps of Engineers (USACE) [2,3]. DOE retained responsibility for determining site eligibility and for conducting LTS&M of remediated sites. A 1999 Memorandum of Understanding between USACE and DOE defines the roles of each agency in administering and executing FUSRAP [4]. USACE was directed to conduct activities in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) [5] and the National Oil and Hazardous Substances Pollution Contingency Plan [6].

The DOE Office of Environmental Management (EM) was created to remediate DOE sites that had no future mission; that oversight did not originally include post-closure responsibilities. Therefore, DOE established LM in 2003 to focus on LTS&M operations and consolidate them within a single organization.

In 2000, DOE and USACE organized the FUSRAP Transition Working Group to coordinate agency activities through the FUSRAP site life cycle (Figure 4). USACE transferred two sites to DOE in 2002.

LM Stewardship: 2003–Present

EM initially retained responsibility for the 25 FUSRAP sites cleaned up between 1979 and 1997. In 2004, LM assumed responsibility for LTS&M of those remediated sites. EM also transferred program eligibility and remediation records and the Considered Sites Database.

Since 1997, seven additional sites have been added to FUSRAP. USACE has completed remediation at five sites and transitioned them to DOE for LTS&M. USACE is currently remediating 23 remaining sites. DOE performs LTS&M on 30 completed sites and anticipates ultimately being responsible for 53 FUSRAP sites (Figure 5).

ELEMENTS OF THE DOE LTS&M PROGRAM FOR FUSRAP SITES

Elements of the DOE FUSRAP LTS&M program are described below.

Protectiveness

By 1997, DOE had remediated most of the 25 completed FUSRAP sites to a condition that allows for their unrestricted use. Radiological conditions at these sites satisfied standards developed for DOE sites [7,8]. In keeping with the As Low As Reasonably Achievable principle, final radionuclide concentrations and

activities were often well less than the standards. These sites pose no risk for any possible future land use, including subsistence farming. The subsistence-farming scenario is the most restrictive because it assumes that humans living on the property will consume food that is produced there.

At several sites, radiological contamination was left in place under supplemental limits; the occurrences pose no risk if they remain undisturbed or are properly managed. LM assessed site risk and has identified sites with supplemental limits areas where institutional controls should be put in place to restrict exposure. Institutional controls typically depend on real property legal actions, such as zoning ordinances, laws, and deed restrictions, to protect public health and the environment from hazardous substances left in place at a site or to ensure the effectiveness of the remedy.

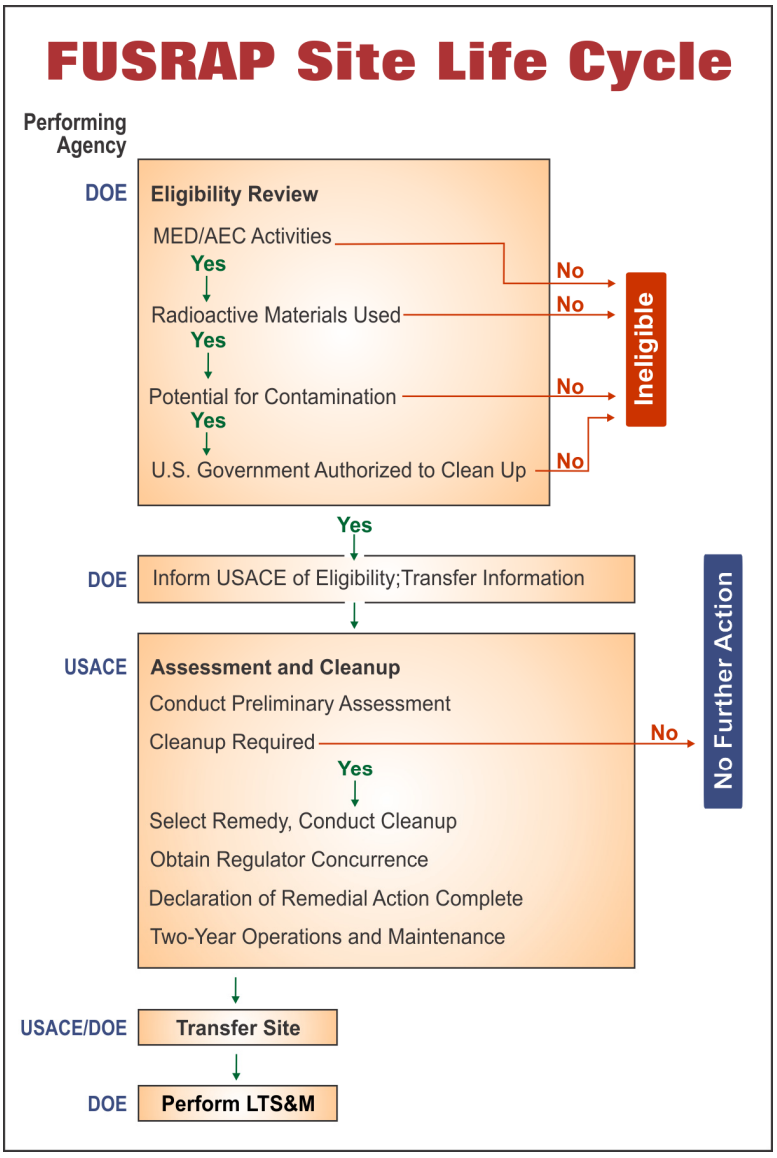

Figure 4. FUSRAP site life cycle.

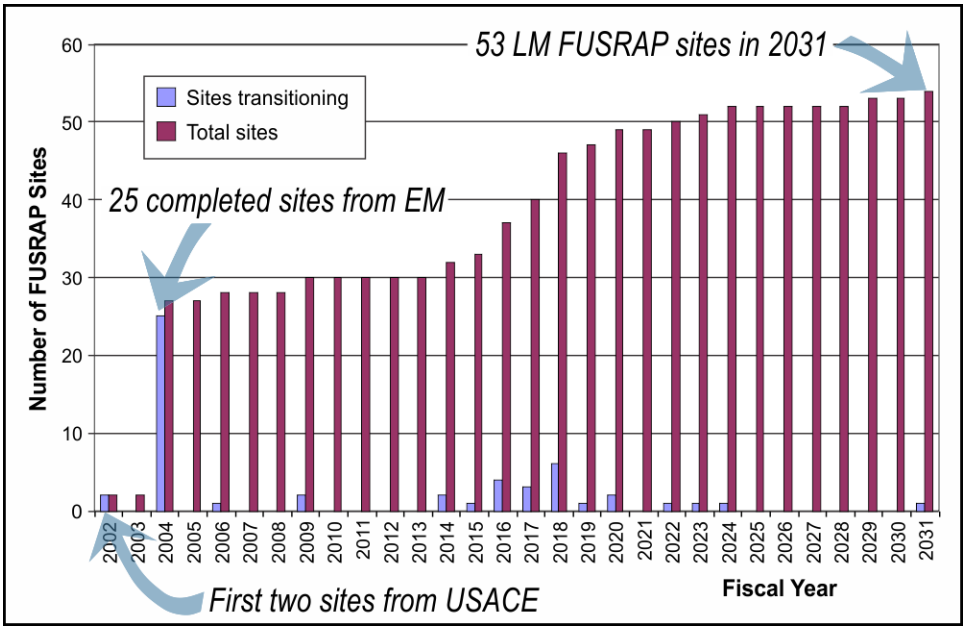

Figure 5. FUSRAP site transitions.

In 2005, LM began to perform baseline site visits to establish local land use trends and document site conditions. This was combined with the review of documents for the remediated sites. DOE confirmed that site conditions remain protective, defined LTS&M requirements, and identified gaps in documentation for the sites. The *Long-Term Surveillance and Maintenance Requirements for Remediated FUSRAP Sites* [9] summarizes radiological conditions and requirements to maintain protectiveness at LM FUSRAP sites.

LTS&M Activities

LM conducts all activities necessary to ensure that sites remain protective and in full compliance with applicable regulations after remedial action is complete. The remedy implemented by DOE or USACE defines LTS&M requirements. If residual contamination remains on a site, LTS&M activities can include maintaining access or institutional controls, conducting inspections or monitoring, and reporting site conditions to stakeholders and regulators. Other activities may include periodically evaluating site protectiveness (e.g., during CERCLA 5-Year Reviews), evaluating monitoring data, and conducting risk assessments. LM conducts all activities using LM federal and contractor staffs and drawing on the resources and expertise of the entire LM organization.

Below are examples of LTS&M activities, showing the diverse requirements for maintaining protectiveness and administering FUSRAP.

In response to stakeholder inquiries at the Niagara Falls Vicinity Properties New York Site in Lewiston, New York (Figure 6) and at the request of the USACE Buffalo District, DOE evaluated the protectiveness of remediated vicinity properties and drainages. DOE confirmed that the remedial action goals were met and the sites are protective. DOE presented the findings to stakeholders at public meetings and solicited additional information and comments.

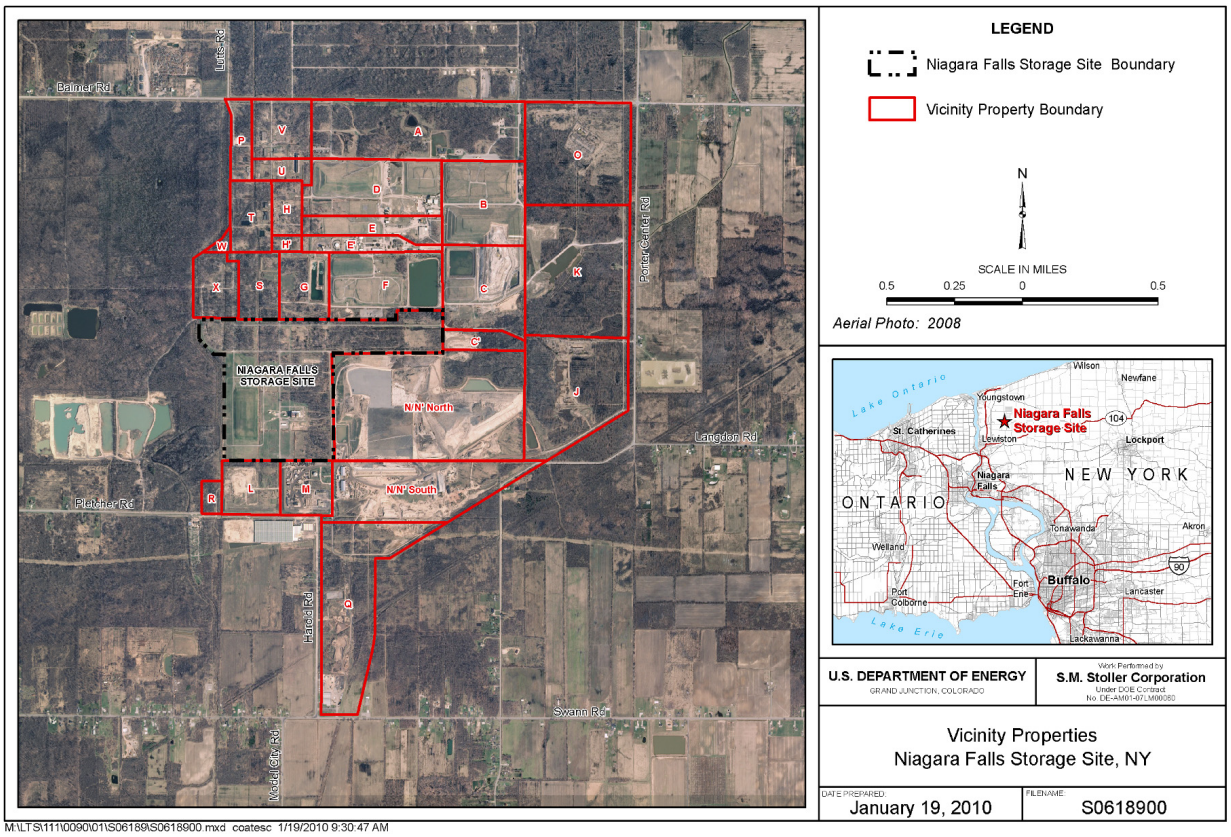

Figure 6. Niagara Falls Storage Site Vicinity Properties, New York, Site.

The Colonie, New York, Site (Figure 7.7) is currently being remediated by the USACE New York District. DOE owns the Colonie Site property and will sell the property for beneficial reuse when it is transitioned. LTS&M requirements will be established upon transition.

Figure 7. USACE contractor and DOE staff discuss final conditions before transition occurs at the Colonie, New York, Site.

In 2004, the Seymour, Connecticut, Site (Figure 8) was transferred from EM to LM. Post-remedial action survey data indicated that the radiological condition of the site was in compliance with the applicable DOE standards and guidelines for the cleanup of residual contamination. Some contamination was left in inaccessible areas, and supplemental limits were applied. The site was released for unrestricted use and remains protective as long as the supplemental-limits area is not disturbed.

Figure 8. DOE inspects the Seymour, Connecticut, Site where supplemental limits were imposed.

At the Wayne, New Jersey, Site (Figure 9) and vicinity properties, the U.S. Environmental Protection Agency completed a pre-final inspection in September 2003 and verified that the remedial action was completed. In 2006, DOE transferred the property to Wayne Township for recreational use under the National Park Service's Land to Parks Program. Deletion from the National Priorities List is pending.

Figure 9. The Wayne, New Jersey, Site was transferred to Wayne Township for recreational use.

At the Middlesex Municipal Landfill, New Jersey, Site (Figure 10), AEC disposed of soil contaminated with uranium ore from the nearby Middlesex Sampling Plant. DOE certified the site to be released for unrestricted use in 1989. LM found the site to be physically unchanged from when remedial action was completed. However, in 2009, during assessment for reuse of the property as a recreational area, additional contamination was identified, and the site was referred to USACE for further assessment.

Figure 10. DOE referred the Middlesex, New Jersey, Municipal Landfill Site to USACE after additional radiological contamination was identified.

Stakeholder Support

LM partners with stakeholders to extend site oversight, establish awareness of LTS&M activities and requirements, and maintain institutional knowledge. Stakeholders can include landowners, regulators, State and local officials, and the public. LM contact information is readily available and LM monitors media to stay informed of stakeholder concerns and land use changes.

Site and program information is available on the Internet at http://www.lm.doe.gov/default.aspx?id=866. Regulators have also submitted requests to reevaluate eligibility determinations. The Considered Sites Database, available at http://www.lm.doe.gov/default.aspx?id=2602, presents the results of eligibility evaluations for the approximately 600 candidate FUSRAP sites and documentation that supports the decisions, as well as documentation through cleanup and site closure for remediated sites. LM provides information directly to stakeholders in response to inquiries or Freedom of Information Act (FOIA) requests. LM expects to receive on average six FOIA requests each year.

DOE also is involved with the larger LTS&M community. LM participates in organizations such as the Association of State and Territorial Solid Waste Management Officials, the Interstate Technology and Research Council, and other organizations whose members include regulators and stakeholders.

Records and Data Management

Site records are archived for the use of future custodians and stakeholders. Records must describe site operations that resulted in waste generation, the extent of contamination, remedial action activities, final

site conditions, site verification, and regulator concurrence. When a site transitions, DOE will review available site information, identify gaps, and obtain missing records.

Many FUSRAP records remain at Federal Records Centers or National Archives repositories operated by the National Archives and Records Administration. Other records are in archives at major DOE facilities, such as the Legacy Management Business Center in Morgantown, West Virginia, or the Savanna River Site in Aiken, South Carolina. LM is continuing to verify the location of FUSRAP site records, obtain custody of records that are crucial to maintaining site protectiveness, and enter index (metadata) information into LM records collections. A finding aid for FUSRAP, *FUSRAP Historical Record: Collections, Contents, Access, Custody, and Finding Aid*, was finalized in 2010 for internal use by DOE researchers responding to FOIA and other stakeholder requests [10].

Major accomplishments have been achieved in FUSRAP records since 2004. Following are some of the most important achievements:

- Gaps in Certification Docket references were located and posted to the LM public website.
- Field assessment and verification records for select FUSRAP sites were found in collections of Oak Ridge Associated Universities and transferred to the Legacy Management Business Center.
- Field records that DOE contractors generated before 1997 were transferred to the Legacy Management Business Center.
- LM reviewed FUSRAP holdings at Oak Ridge National Laboratories and generated an index for future searches.
- Historical records accessions at Federal Records Centers have been cross-referenced to National Archives and Records Administration holdings.

When a site is transferred from USACE to DOE, LM will request paper and electronic copies of site documents, geospatial data, monitoring results, photographs, and any other available information. Milestone documents will be posted on the LM website. LM will use the geospatial data for base maps for use at sites with active LTS&M requirements. Monitoring data are needed to track trends and demonstrate protectiveness. LM also acquires metadata from USACE remediation records. The USACE FUSRAP records are scheduled for permanent retention. Part of the records management task includes responding to FUSRAP-related inquiries and FOIA requests: typically, these requests are for documents and records.

DOE/USACE Coordination

LM and USACE districts with FUSRAP sites work closely together to coordinate activities through the FUSRAP life cycle. For example:

- Program-level FUSRAP USACE and LM managers attend quarterly FUSRAP Working Group meetings to communicate program and site-specific issues.
- LM coordinates with USACE district staff in order to visit completed, active, or transitioning sites, to maintain active communication with the responsible USACE district, and to review site conditions.

Eligibility Determinations

DOE reviews historical records to document that a candidate site was contracted to provide services in support of MED or AEC. DOE then establishes that radioactive materials were used at the site and that there is a reasonable potential for residual contamination to remain. Finally, DOE determines its legal responsibility for the residual contamination and its authorization to conduct remedial action. DOE notifies USACE of the results of eligibility determinations.

Site Transition

USACE District and LM staffs initially coordinate site transition informally through phone calls and site visits. Prior to transition, USACE will provide DOE with courtesy copies of the ROD, Site Closure Report, and other milestone documents; DOE uses this information to plan for implementing LTS&M requirements for a particular site, which may include land use controls, surveillance, monitoring, and maintenance. USACE provides a site completion schedule to DOE, which DOE uses as the basis for scheduling transition support resources (Table 1).

USACE retains responsibility for surveillance, operation, and maintenance at a remediated site through a 2-year operations and maintenance period that commences after site cleanup is complete. At the end of that period, USACE posts a public notice of satisfactory remedy performance in accordance with CERCLA, the National Contingency Plan, and USACE procedures; and USACE formally transfers responsibility for the site to DOE.

During the operations and maintenance period, DOE conducts a structured transition process to prepare to maintain the remedy at a remediated FUSRAP site. DOE follows internal guidance for assuming responsibility for remediated sites [11]. Transition activities include identifying and acquiring needed data, reviewing documents and interviewing remediation personnel, attending stakeholder meetings and creating an information repository on the LM website, and generating LTS&M plans for sites that cannot be released for unrestricted use. One of the main goals of site transition is to capture institutional knowledge of site history and conditions. LM seeks to maintain a close partnership with USACE to ensure that there is an opportunity for the staff members of both agencies to interact so LM custodians can acquire essential knowledge about the transitioning sites.

Reuse and Real Property Management

DOE owns four FUSRAP sites. In keeping with DOE’s goal of returning sites to beneficial use, LM intends to disposition the sites as quickly as possible after transition from USACE. In 2006, DOE transferred the Wayne, New Jersey, Site to Wayne Township for park and recreational use under the National Park Service’s Land to Parks Program. In 2009, LM transferred the New Brunswick, New Jersey, Site to a private entity.

Summary

Over the life of the FUSRAP program from 1974 to the present, DOE's primary mission and responsibility has been to ensure that FUSRAP sites remain protective of human health and the environment. In fulfilling this mission, the DOE program includes the following key elements: eligibility determinations, transition of remediated sites from USACE to DOE, LTS&M operations such as inspections and institutional controls management, stakeholder support, preservation of records, and real property and reuse. DOE maintains close communication stakeholders as well as state and federal regulators. DOE programs are designed to preserve and present the information that future stewards and stakeholders will need to maintain site remedies and knowledge.

Table I. FUSRAP Site Completion Schedule as of November 2010.

Site	City	State	Estimated Year of Construction Completion	Estimated Year of Transition	Owned By	Acres	EPA NPL Site	NRC License
IA Army Ammunition Plant (IAAP)	Middletown	IA	2015	2017	DOD	Unknown	IA7213820445	NO
Painesville Site	Painesville	OH	2012	2014	Private	15.0	NO	NO
Combustion Engineering	Windsor	CT	2013	2015 [1]	Private	600.0	NO	YES
Hazelwood Interim Storage Site/Latty Ave	St. Louis	MO	2014	2016	Private	20.0	MOD980633176	NO
Shpack Landfill	Attleboro	MA	2010	2014 [1]	Private	8.0	MAD980503973	NO
St. Louis Airport Site	St. Louis	MO	2007	2016 [2]	Private	21.7	MOD980633176	NO
St. Louis Airport Site Vicinity Properties	St. Louis	MO	2014	2016	Private	100.0	NO	NO
St. Louis Downtown Site	St. Louis	MO	2014	2016	Private	45.0	NO	YES
W.R. Grace Co.	Curtis Bay	MD	2015	2017 [1]	Private	40.0	NO	NO
Colonie Interim Storage Site	Colonie	NY	2014	2017 [3]	DOE	11.2	NO	NO
E.I. Du Pont	Deepwater	NJ	2017	2019	Private	700.0	NO	NO
Linde Air Products Div	Tonawanda	NY	2016	2018 [4]	Private	105.0	NO	NO
Shallow Land Disposal Area	Vandergrift	PA	2021	2023	Private	44	NO	YES
Middlesex Sampling Plant	Middlesex	NJ	2018	2020 [3]	DOE	17.6	NJ0890090012	NO
Maywood Interim Storage Site	Maywood	NJ	2022	2024	DOE	140.0	NJD980529762	YES
Seaway Industrial Park	Tonawanda	NY	2020	2022	Private	100.0	NO	NO
Luckey Site	Luckey	OH	2029	2031	Private	40.0	NO	NO
Guterl Specialty Steel Corp.	Lockport	NY	Unknown	Unknown	Private	Unknown	NO	NO
Harshaw Chemical Company	Cleveland	OH	Unknown	Unknown	Private	40.0	NO	NO
Joslyn Manufacturing & Supply Company	Fort Wayne	IN	Unknown	Unknown	Private	Unknown	NO	NO
Niagara Falls Storage Site	Lewiston	NY	Unknown	Unknown	DOE	191.0	NO	NO
Superior Steel (Superbolt)	Carnegie	OH	Unknown	Unknown	Private		NO	NO
Sylvania-Corning Plant Site	Hicksville	NY	Unknown	Unknown	Private		NO	NO

EPA NPL = U.S. Environmental Protection Agency National Priorities List
NRC = U.S. Nuclear Regulatory Commission

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11. DOE (U.S. Department of Energy), 2009. *Process for Transition of Uranium Mill Tailings Radiation Control Act Title II Disposal Sites to the U.S. Department of Energy Office of Legacy Management for Long-Term Surveillance and Maintenance*, June. See also the *Site Transition Framework.* Both documents are available at http://www.lm.doe.gov/pro_doc/guidance_reports.htm.