

EXPLANATION OF SIGNIFICANT DIFFERENCES

FUSRAP Soils and Buildings
Maywood Chemical Co. Superfund Site
Maywood, New Jersey

Site Name and Location: Maywood Chemical Co. Superfund Site (FUSRAP Maywood Superfund Site/Maywood Site) Boroughs of Maywood, Lodi, and the Township of Rochelle Park, Bergen County, New Jersey USEPA ID: NJD980529762

Lead Agency: The U.S. Army Corps of Engineers (USACE), New York District

Support Agencies: U.S. Environmental Protection Agency, Region 2 (USEPA) and New Jersey Department of Environmental Protection (NJDEP)

I. Statement of Purpose

The purpose of this Explanation of Significant Differences (ESD) is to incorporate the Phase 1 properties that were investigated and partially remediated before the August 19, 2003 FUSRAP Soils and Buildings Record of Decision (ROD) for Operable Unit 1 (OU1) and discovered during the implementation of the ROD; and increase volume and cost estimates from the FUSRAP 2003 Soils and Buildings ROD. Further, this ESD will refine the definition of inaccessible soils under public roadways. See Figure 1.

The cleanup of the Maywood site is being carried out in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 USC §§ 9601 et seq., the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (C.F.R.) Part 300, and the Formerly Utilized Sites Remedial Action Program (FUSRAP).

On August 19, 2003, the North Atlantic Division Engineer for the USACE signed the FUSRAP Soils and Buildings Record of Decision (ROD), for an area identified as OU1. This area is referred to as OU2 in the USEPA CERCLA databases, for the Maywood Chemical Co. Superfund Site. This ROD was co-signed by the Regional Administrator for the USEPA Region 2 on September 22, 2003. While a 2012 Groundwater (FUSRAP OU2, identified as OU3 in the USEPA CERCLA databases) ROD and a 2014 Non-FUSRAP Soil and Source Areas ROD (for an area identified as OU1 in USEPA CERCLA databases) also exist for this project, this ESD applies only to the FUSRAP 2003 Soils and Buildings ROD. Since this area is identified as OU1 for the FUSRAP project and OU2 for the Superfund project, the use of the OU designation moving forward in this document will be minimally used. This ESD corresponds to the FUSRAP 2003 Soils and Buildings ROD and will be documented that way throughout.

This decision document (ESD) presents the selected remedial action for soils and buildings at the FUSRAP portion of the Maywood Chemical Co. Superfund Site (hereafter referred to as the "FUSRAP Maywood Superfund Site" or FMSS), in Bergen County, New Jersey. The ROD presumed prior actions taken by the U.S. Department of Energy (USDOE) in 1984-



1985 and 1995-1996 and by the USACE from 1997-2003 to clean up properties in the vicinity of the FMSS were sufficient to meet cleanup criteria specified in the FUSRAP 2003 Soils and Buildings ROD. However, this presumption needed to be verified, and these properties were identified in the FUSRAP 2003 Soils and Buildings ROD as needing to be addressed administratively in a future decision document. Furthermore, during implementation of the remedial action, contaminated soils above cleanup levels were identified on four additional properties that were not included in the FUSRAP 2003 Soils and Buildings ROD, and it was determined that these properties should be addressed as part of the soil remedial action within the FUSRAP 2003 Soils and Buildings ROD. Additionally, to address conflicting language within the FUSRAP 2003 Soils and Buildings ROD regarding inaccessible contaminated soil, a clarification to the language of that document is required.

This ESD is issued in accordance with Section 117(c) of CERCLA, 42 U.S.C. § 9617(c), and Sections 300.435(c)(2)(i) and 300.825(a)(2) of the NCP, 40 C.F.R. 300.435(c)(2)(i) and 300.825(a)(2). An ESD is required if the remedy is modified in a way that differs significantly, but not fundamentally, in scope, performance, or cost from the remedy selected in the ROD for the Site. This ESD serves to document and explain the modifications to the scope and cost of the remedy, and has been prepared to provide the public with an explanation of the nature of a change in scope and cost made to the selected remedy set forth in the ROD; to summarize the information that led to the change; and to affirm that the revised remedy complies with the statutory requirements of CERCLA Section 121, 42 U.S.C. § 9621.

This ESD, and documents that provide the basis of the ESD decision, will be incorporated into the Administrative Record for the FMSS OU 1 in accordance with Section 300.825(a)(2) of the NCP. The Administrative Record is located at the FUSRAP Public Information Center, 75A West Pleasant Avenue, Maywood, NJ and at the USEPA Region 2 Records Center, 290 Broadway, New York, NY. Web sites established for the FUSRAP Maywood Superfund Site can be found at:

USACE website
<http://fusrapmaywood.com/>

USEPA website
<https://www.epa.gov/superfund/maywood-chemical>

II. Summary of the Site Conditions, Site History, and Selected Remedy

A. Site Conditions

The FMSS originally consisted of 88 vicinity properties (VPs), as categorized in Table 1 below. Under FUSRAP, the term "vicinity property" refers to a property adjacent or near a FUSRAP site that has been contaminated by radioactive and/or chemical waste materials attributable to activities which supported the nation's early atomic energy program according to the 1999 *Memorandum of Understanding Between the U.S. Department of Energy and the U.S. Army Corps of Engineers Regarding Program Administration and Execution of the Formerly Utilized Sites Remedial Action Program*. Of the 88 VPs, 64 Phase 1 properties (including all residential and municipal properties) have already been addressed by US DOE or USACE, although further action may be warranted on three of these properties, based on assessments. During cleanup actions on these VPs, additional properties were remediated. This occurred if the contamination on a VP was found to extend to an adjacent

property. Such properties are not formally designated as VPs under FUSRAP but are informally referred to as "chase properties."

The FUSRAP 2003 Soils and Buildings ROD addressed what are referred to as Phase 2 properties. Phase 1 properties were initially addressed by USDOE prior to the FUSRAP 2003 Soils and Buildings ROD and were intended to be addressed in a future USACE Decision Document. In a November 2014 USACE memorandum, four additional properties were officially designated by the USACE as new VPs of the FMSS. These properties are referenced in Table 1 below and bring the total number of designated VPs at the FMSS to 92.

TABLE 1 – FMSS Designated Properties

Stepan Company Property (including contaminated buildings and 3 US Nuclear Regulatory Commission (USNRC) -licensed burial pits)	Original designation	Phase 2
Maywood Interim Storage Site (MISS)	Original designation	Phase 2
59 residential properties	Original designation	Phase 1
3 properties owned by state or Federal government	Original designation	Phase 2
4 municipal properties	Original designation	Phase 1
20 commercial properties	Original designation	19 properties in Phase 2 and 1 property in Phase 1
Inaccessible soils under streets	Original designation	See Sec III.C of this ESD
4 additional USACE designated VPs	Nov 2014 designation	USACE designated properties

B. Site History

Radioactive contamination at the FMSS resulted from rare earth and thorium processing operations and associated material storage and waste disposal conducted by former Maywood Chemical Works (MCW). Historical records indicate that processing of thorium from monazite sands may have begun as early as 1895; other records indicate that thorium processing was initiated in 1916 and continued until 1957. Processing operations created wastes containing thorium and lesser amounts of radium and uranium as well as rare earths. Some of these process wastes and residues were stored, treated, or disposed on the original processing site where the MISS and Stepan Company are now located. In addition, radioactive material was spread to nearby properties by use of the waste materials as mulch and fill or through soil and sediment transport along Lodi Brook and Westerly Brook. Although currently an underground culvert, Lodi Brook was formerly an open channel.

In 1959, MCW sold the plant to the Stepan Company. In the late 1960s, Stepan Company took corrective measures at some of the former disposal areas located on the original MCW plant site property both east and west of NJ State Route 17. NJ State Route 17 was built in the early 1930s over and through the MCW's thorium waste lagoons, with contamination currently remaining under Route 17. Stepan Company's corrective measures included relocation and burial of approximately 19,100 cubic yards (cy) of excavated waste materials. Between 1966 and 1968, these waste materials were relocated to three burial areas on property currently owned by Stepan Company. Stepan Company sold the portion of the original plant property located west of NJ State Route 17 after relocation of the waste materials. Stepan

Company held a USNRC license for the storage of thorium-bearing materials in Burial Pits 1, 2, and 3. These burial pits were remediated by USACE, and USNRC terminated Stepan's license in February 2016.

USEPA listed the Maywood Chemical Co. Superfund Site on the Superfund National Priorities List (NPL) on September 8, 1983. In late 1983, Congress assigned USDOE a research and development project to clean up the radioactive wastes at the Maywood Chemical Co. Superfund Site (via the FY84 Energy and Water Appropriations Act). USDOE then assigned the site to FUSRAP. In 1997, the FY98 Energy and Water Development Appropriations Act transferred responsibility for the execution and administration of FUSRAP from USDOE to the USACE. The inclusion of chemical contaminants under the FMSS definition of FUSRAP waste is limited to chemicals on the government owned MISS or chemicals on vicinity properties that are commingled with or related to the radioactive waste, chemicals associated with thorium processing at MCW, and chemicals on or migrating from the MISS. The Stepan Company, which operates an active chemical manufacturing facility at the Maywood Chemical Co. Superfund Site, is conducting response activities associated with chemical, non- radiological contamination on its facility and on adjacent properties which were part of the original MCW facility. This work is separate from the USACE FUSRAP work and being conducted by Stepan Company under USEPA oversight. The USEPA is overseeing the Stepan Company response activities identified in a 2014 Stepan ROD for Soil and Source Areas, (known as OU1 in USEPA CERCLA databases) and is coordinating that ROD cleanup work with USACE. Stepan Company is also conducting investigation work and feasibility studies to address groundwater contamination (known as OU4 in USEPA CERCLA databases) which is not being addressed by the USACE FUSRAP groundwater remedy selected in the FUSRAP 2012 Groundwater ROD.

USDOE began investigating the FMSS and surrounding area in 1983, and during 1984 to 1985 cleaned up 25 residential properties and a portion of one commercially zoned property as part of the Phase 1 work. Due to the limited commercial disposal capacity for radiological wastes available at that time, the excavated materials from these cleanups were stored on property that was a part of the original MCW processing site. USDOE acquired this property from Stepan Company and named it the MISS. During a cleanup action conducted by USDOE in 1995 and 1996, these stored materials were removed from the MISS and sent to a permanent, off-site commercial disposal facility. Also, during 1995, the cleanup of the remaining 34 residential properties, four municipal properties (three parks and a fire station), and one commercially zoned property was initiated as part of the Phase 1 efforts. These interim property cleanups were implemented as non-time critical removal actions as proposed in USDOE's September 1995 Engineering Evaluation/Cost Analysis (EE/CA) under CERCLA. These removal actions were completed in 2000 by the USACE under a September 1995 USDOE "Maywood Site - Action Memorandum for the removal of contaminated materials from the residential and municipal vicinity properties."

Another time critical removal action was completed by USACE during the winter of 2000 to remove contaminated sediments from portions of Lodi Brook and a swale located at the terminus of West Howcroft Road. This removal action re-established the hydraulic grade of the brook and swale, prevented additional flooding, and prevented the transport or migration of contaminated soil by floodingwater.

In July 2001, the USACE published the *Engineering Evaluation/Cost Analysis for a Removal Action in Support of NJDOT Roadway Improvement Projects at the FUSRAP Maywood Superfund Site (FMSS)* for public comment. The Action Memorandum for this work was approved in November 2001, and the non-time critical removal action was initiated in January 2002. With the implementation of the FUSRAP 2003 Soils and Buildings ROD, the removal action was transitioned into the remedial action. Several Soils and Buildings (FUSRAP OU1) properties addressed by the ROD previously remediated through this removal action were surveyed to ensure that the properties met both the cleanup criteria and Applicable or Relevant and Appropriate Requirements (ARARs) established in the ROD.

C. Selected Remedy under FUSRAP 2003 Soils and Buildings Record of Decision

The FUSRAP 2003 Soils and Buildings ROD for the FMSS addresses the remediation of contaminated soil, debris (e.g., buried drums), and building materials defined as FUSRAP waste at the former MCW site and commercial/government properties in the vicinity of the site, in accordance with the remedial action objectives (RAOs) established in Section II.I of the Decision Summary. This ROD also addresses the Stepan Company burial pits that were licensed and regulated by the USNRC.

The FUSRAP 2003 Soil and Buildings ROD established the following cleanup criteria for the radioactive soils and buildings contamination at the FMSS:

- An average of 5 picoCuries per gram (pCi/g) of radium-226 (Ra-226) and thorium-232 (Th-232) combined above background for soils on residential or unrestricted use properties.
- An average of 15 pCi/g Ra-226 and Th-232 combined above background for subsurface soils with an "as low as reasonably achievable" (ALARA) goal of 5 pCi/g on commercial or restricted use properties.
- An average of 100 pCi/g above background for total uranium, which equates to approximately 50 pCi/g of uranium-238 (U-238) at all properties addressed in this ROD.
- Soil and building remediation will meet the 15 millirem per year (mrem/year) above background dose limit specified in New Jersey Administrative Code (NJAC) 7:28-12.8(a)1 at all properties addressed in this ROD.
- Indoor radon air concentrations will meet the 3 picoCuries per liter (pCi/L) radon-222 (Rn-222) limit specified in the NJAC 7:28-12.8(a)2 at all properties addressed in this ROD.
- NJAC 7:28-12.8(a)1 (15 mrem/year) will be used as ARARs for the remediation of the NRC-licensed burial pits on the Stepan Company property, and so they will meet the NRC standard of 25 mrem/year at 10 C.F.R. 20.1402.
- Any FMSS remediation-derived water discharged to a Publicly Owned Treatment Works (POTW) will meet or exceed the POTW's designated pre-treatment standards prior to discharge. Any FMSS remediation-derived water discharged from a point

source to a surface water body or groundwater will comply with the relevant and appropriate promulgated state and Federal standards for the FMSS contaminants of concern (COCs). In the absence of specific discharge limitations, point source discharges will meet or exceed federal maximum contaminant levels (MCLs) for each COC.

The major components of the FUSRAP 2003 Soils and Buildings ROD selected remedy include the following:

- Excavation/removal of the remaining soils and buried bulk waste with contamination above the RAOs.
- Physical separation of excavated material (not to be confused with treatment) to sort wastes potentially requiring disposal as mixed wastes and other bulk waste from soils requiring disposal as radioactive waste.
- Institutional and land use controls on properties in designated areas where contamination remains at levels higher than the levels established for release. The objectives of the institutional and land use controls are to limit land use to commercial/industrial, prohibit residential use, and prohibit excavation in designated restricted areas.
- Off-site disposal of the FUSRAP waste materials.
- Decontamination and demolition, as necessary, of buildings on Stepan Company and the MISS.
- Appropriate environmental monitoring to ensure the effectiveness of the remedy.

III. Description of Significant Differences

Since the issuance of the Soils and Buildings (FUSRAP OU1) ROD in 2003, the scope of the selected remedy set forth in the ROD has expanded, resulting in an increase in cost. Three significant differences are identified below.

A. INCORPORATION OF PHASE 1 PROPERTIES

USDOE and USACE addressed the Phase 1 properties with Removal Actions and other remedial measures at different times in accordance with the USDOE Remedial Action Implementation Plan. In accordance with the CERCLA process, the work completed at these properties must be documented in a decision document. This ESD is being used to document this work in lieu of a new ROD as discussed in the FUSRAP 2003 Soils and Buildings ROD. The 2009 USEPA *Five Year Review Report* (FYR) evaluated the actions taken on the Phase 1 properties and deemed most as satisfying the current FUSRAP 2003 Soils and Buildings ROD. The FYR did, however, identify properties that required additional information to demonstrate compliance with the FUSRAP 2003 Soils and Buildings ROD.

The 2009 FYR stated, "All properties which were not addressed in the 2003 OU2 ROD will be included in a future CERCLA decision document and will be subject to future five-year reviews." Note the language used by USEPA in the FYR was referring to OU2 as identified by USEPA, which corresponds to the FUSRAP OU1. The FYR utilized a comparison to criteria in place at the time of the removal action or remedial measure to assess properties. In 2014, the USEPA completed its second Five Year Review. This FYR determined that a

CERCLA decision document is not needed for additional property evaluations which are being conducted in accordance with the FUSRAP 2003 Soils and Buildings ROD. This determination was made by USEPA based in part on the additional property evaluations conducted by USACE in 2013 and 2014 that were addressed in the *Technical Memorandum, FUSRAP Maywood Superfund Site Property Assessment, August 2013*. Subsequently, USACE determined that an ESD is needed to demonstrate compliance with the FUSRAP 2003 Soils and Buildings ROD for the soils at Phase 1 properties and four new VPs that were added to the FMSS in 2014.

Phase 1 properties are grouped into the same groups identified in the FYR Report. These are as follows:

1984-1985 USDOE Remedial Measures

1995-1999 USDOE and USACE Remedial Measures or Removal Actions

This ESD serves to incorporate the 64 Phase 1 properties into the FUSRAP 2003 Soils and Buildings ROD. Doing so will ensure that these previously addressed properties are adequately documented in accordance with CERCLA. Inclusion of these 64 properties was always contemplated in the FUSRAP 2003 Soils and Buildings ROD; this ESD now explicitly addresses them. Of the 64 properties, a review by USACE, documented in the 2013 *FUSRAP Maywood Superfund Site Property Assessment Technical Memorandum (VP TM)*, and additional investigations found that 61 are already in compliance with the ROD and do not require any further actions. Three properties have been identified as requiring additional investigation, land use controls, or remediation. USACE is addressing those three properties to meet the ROD criteria.

B. ADDITIONAL VOLUME

Table 2 of the FUSRAP 2003 Soils and Buildings ROD identified an FMSS contaminated soil volume estimate of 281,288 cy. This volume represented in-situ soil volumes and included both accessible and inaccessible materials, at properties being cleaned to allow for either restricted or unrestricted use, as planned in the ROD. These volumes have significantly changed since the ROD was signed in 2003, impacting the total cost of the selected remedy and providing additional need for this ESD. Changes in volume are attributed in part to meeting ALARA goals, chasing contamination that extended from VPs to adjacent properties, not accounting for slope back and overburden in the original estimates, property additions, and in-situ volume estimates being compared to ex-situ actual volumes.

The total amount of in-situ excavated contaminated soils as of June 2019 is 548,973 cy with an estimated 102,719 cy yet to be excavated, for a total of 696,692 cy. This significant increase in contaminated waste volume to be remediated to meet the selected cleanup levels has increased the estimated cost of the remedy that was documented in the ROD cost estimate. The original total cost for the selected remedy (Alternative 3) was estimated at \$254 million in 2003. The revised total cost for the project is estimated at approximately \$700 million current year dollars.

C. INACCESSIBLE SOILS UNDER STREETS

Since the FUSRAP 2003 Soils and Buildings ROD, USACE has become aware of instances of underground utility work in the FMSS areas where inaccessible materials exist under residential roadways.

In some cases, utility providers have coordinated this work with USACE; in others, it has been conducted in emergency or other unplanned circumstances with minimal or no coordination. To address future utility worker exposure concerns, USACE proposes by way of this ESD to proactively address inaccessible soils under streets by excavation, removal, and off-site disposal of the contaminated soil where technically feasible.

To facilitate understanding of the remedial action identified for these inaccessible soils as described above, USACE has determined that clarification of relevant language in the FUSRAP 2003 Soils and Buildings ROD is needed. The ROD at Section II.D states "Residential streets assumed to be underlain by contaminated soil are included with other inaccessible soils in the commercial/government property unit. These properties will be addressed in a future FMSS ROD." The FUSRAP 2003 Soils and Buildings ROD at Section II.M.2 states "...inaccessible soils currently located under buildings and roadways would be excavated and disposed off-site as they become accessible in the future." To clarify these separate references to inaccessible soil under "residential streets" and "roadways," this ESD defines "residential streets" and "roadway" as all public ways impacted by FUSRAP material, and not limited to roads in residential areas.

For materials that will remain inaccessible, the plan is to coordinate with property owners and gain permission to record deed notices on their behalf, per the FUSRAP 2003 Soils and Buildings ROD and Land Use Control Implementation Plan. These deed notices will be in addition to any existing land use controls. The USACE will be transferring the project to the USDOE Legacy Management program once all accessible contamination is removed and deed notices for inaccessible contamination are in place. Additionally, the USACE began remediation of street roadbeds in 2019 rather than waiting for contamination to become accessible through coincident municipal and utility work that would expose the contamination. This will reduce the amount of inaccessible contamination remaining for the Site that will need long term stewardship management by USDOE Legacy Management program.

IV. Support Agency Review

USACE has consulted with USEPA and NJDEP on the changes proposed in this ESD in accordance with 40 C.F.R. 300.435(c)(2).

V. Statutory Determinations

USACE has determined that a change in the scope and cost of remedy set forth in the ROD is warranted. This ESD is issued in accordance with Section 117(c) of CERCLA, 42 U.S.C. § 9617(c), and Sections 300.435(c)(2)(i) and 300.825(a)(2) of the N.C.P., 40 C.F.R. 300.435(c)(2)(i) and 300.825(a)(2). An ESD is required if the remedy is modified in a way that differs significantly, but not fundamentally, in scope, performance, or cost from the remedy selected in the ROD for the site.

USACE has coordinated with USEPA and NJDEP on this ESD. No formal comments were received but input from these regulatory agencies was incorporated into this ESD.

The FUSRAP 2003 Soils and Buildings ROD for the FMSS remains protective of human health and the environment and continues to meet ARARs (40 C.F.R. 300.430(f)(1)(ii)(B)(1) and (2)).

The selected remedy is protective of human health and the environment, complies with Federal and State laws and regulations that are applicable or relevant and appropriate to the remedial action, and is cost effective. The selected remedy will utilize permanent solutions to the maximum extent practicable. The remedy does not satisfy the statutory preference for treatment found in the NCP Section 300.430(e)(9)(iii), but contaminated material will be excavated and disposed of off-site.

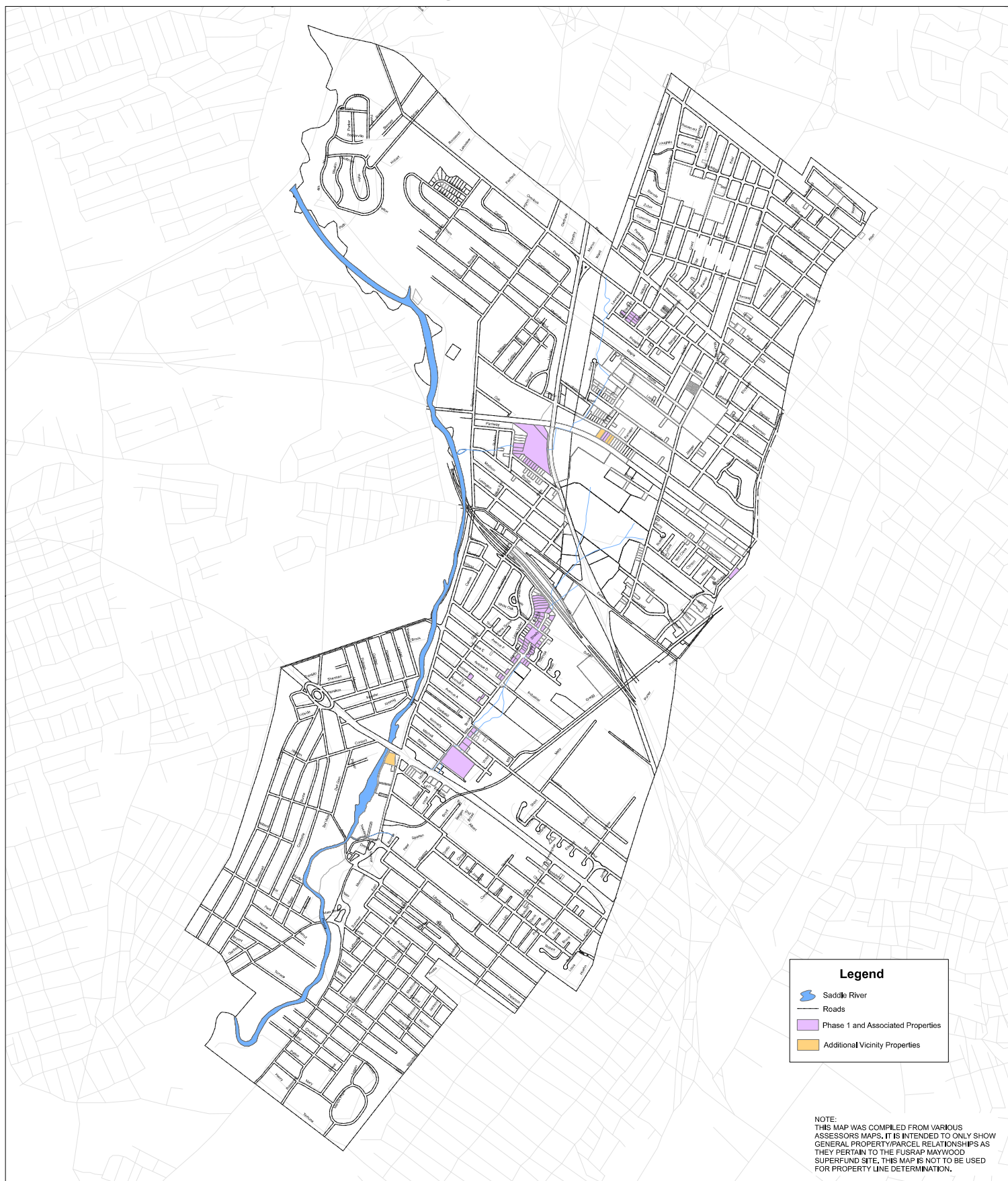
Five-year reviews are being conducted in compliance with CERCLA Section 121(C) and the NCP Section 300.430(f)(4)(ii), and this change does not alter that requirement for the Site, as areas remain where wastes will be left in place above unrestricted use/unlimited exposure standards.

VI. Public Participation

A notice of availability and a summary of this ESD will be published in a local major newspaper in accordance with 40 C.F.R. 300.435(c)(2)(i)(B). The USACE will further utilize additional means of notification to the public such as inclusion on the project website and online local media.

The final ESD will be made available to the public by placing it in the Information Repositories and Administrative Record in accordance with 40 C.F.R. 300.435(c)(2)(i)(A).

**Figure 1 - FUSRAP Maywood Superfund Site
Explanation of Significant Difference Properties**



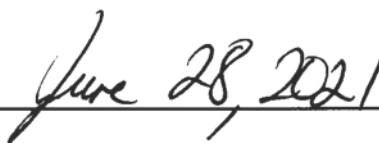
VII. Authorizing Signatures



5/14/21

Jaime Pinkham
Acting Assistant Secretary of the Army
(Civil Works)

DATE



Michael S. Regan, Administrator
U.S. Environmental Protection Agency

DATE