

## **Vicinity Property Assessments at Formerly Utilized Sites Remedial Action Program Project Sites in the New York District**

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### **ABSTRACT**

The Formerly Utilized Sites Remedial Action Program (FUSRAP) has addressed sites across the nation for almost 4 decades. Multiple stake holder pressures, multiple regulations, and process changes occur over such long time periods. These result in many challenges to the FUSRAP project teams. Initial FUSRAP work was not performed under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Records of Decision (ROD). The ROD identifies the remedy decision and ultimately the criteria to be used to release a site. Early FUSRAP projects used DOE Orders or the Uranium Mill Tailings Radiation Control Act (UMTRCA) standards. Under current RODs, regulations may differ, resulting in different cleanup criteria than that used in prior Vicinity Property (VP) remediation. The USACE, in preparation for closeout of Sites, conducts reviews to evaluate whether prior actions were sufficient to meet the cleanup criteria specified in the current ROD. On the basis of these reviews, USACE has conducted additional sampling, determined that prior actions were sufficient, or conducted additional remediation consistent with the selected remedy in the ROD. As the public pressures, regulations, and processes that the FUSRAP encounters continue to change, the program itself continues to evolve. Assessment of VPs at FUSRAP sites is a necessary step in the lifecycle of our site management.

### **INTRODUCTION**

The Formerly Utilized Sites Remedial Action Program (FUSRAP) has addressed sites across the nation for almost 40 years. Some sites have been active in FUSRAP for 20-30 years. Multiple stake holder pressures, multiple regulations [Applicable or Relevant and Appropriate Requirements (ARAR) (and changes to those ARARs)], and process changes occur over such long time periods. These result in many challenges to the FUSRAP project teams.

The US Army Corps of Engineers (USACE) currently addresses FUSRAP sites in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process as required by Public Law 105-245, October 7, 1998. As USACE begins to look ahead to the transfer of completed properties and sites to the Department of Energy (DOE) Legacy Management program, the USACE is reassessing work that was not completed under CERCLA.

The term Vicinity Property (VP) is used here to mean any property in the vicinity of a CERCLA “facility.” Many of the VPs to current FUSRAP sites were addressed prior to the adoption of the CERCLA process.

Review of previously identified VPs is required for a number of reasons. To begin, initial FUSRAP work was not performed under CERCLA Records of Decision (ROD). The ROD

identifies the remedy decision and ultimately the criteria to be used to release a site. Early FUSRAP projects used DOE Orders or the Uranium Mill Tailings Radiation Control Act (UMTRCA) standard as ARARs. Under current RODs, ARARs may differ, resulting in different cleanup criteria. VP reviews are also required for National Priorities List (NPL) delisting of a site and to assess data limitations.

## **DISCUSSIONS AND BACKGROUND INFORMATION**

### **Overall Process**

As stated, USACE currently addresses FUSRAP sites in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act process. The process is conducted in many phases which each require many steps and documentation. The primary phases requiring documentation are:

- Preliminary Assessment
- Site Inspection
- Remedial Investigation
- Feasibility Study
- Proposed Remedial Action Plan
- Record Of Decision
- Remedial Action
- Close Out

The CERCLA process can be quite lengthy in itself. At many FUSRAP sites USACE chose to first address remaining contaminated areas. Depending on the ARARs chosen to address the remaining contamination versus the approach taken in previous remediations a ROD may not have included the previously addressed properties.

This results in properties not addressed by the CERCLA process and thus a potential remaining liability. Options on addressing these properties include:

- Consider as separate facility or operable unit. This would require the entire CERCLA process be completed. Although streamlined it still takes time. Additionally, the entire process may not be required.
- Amend the ROD. A lengthy process itself that potentially could impact the current actions.
- Prepare an Explanation of Significant Difference (ESD). This allows the VPs to be addressed by the current ROD but it does require specific conditions exist (e.g. consistency with current Site approach and public acceptance).
- Other options exist but are very limited and not implemented by USACE to date, thus are not discussed herein.

### **Technical Data Evaluation Considerations**

Release of property surveys and investigation approaches have changed periodically and dramatically since the 1970's when FUSRAP began. It is expected that survey methodology will continue to change throughout the foreseeable future.

The standardization of release survey approaches by the Multi-Agency Radiation Site Survey and Investigation Manual (MARSSIM) in the late 1990's and its revision in August 2000 was the last such major change [1]. MARSSIM presents a federal agency (USEPA, USDOE, USDOD, and USNRC) agreed approach to site release surveys. Prior to MARSSIM a standard approach did not exist. As a result differences in approaches to release surveys existed between programs. FUSRAP prior to 1998 utilized its own guidance which changed over time. USACE utilizes the MARSSIM approach, thus previous data is viewed with the MARSSIM approach and principles in mind.

One point of consideration is the Survey Unit (SU) size limitations in MARSSIM. In reviewing past release survey data USACE has considered several approaches to account for this. Use of a "floating SU" approach has stood out as easily implementable. This approach is to simply assume any 2,000 square meter area must meet the release criteria. In this manner large areas are not divided thus possibly splitting elevated data between SU.

Other considerations include: data quality (does past data meet today's quality standards), data type (does past data allow comparison to the ROD criteria), sufficient data (is there sufficient data to perform statistical tests), and how to handle elevated sample results.

Data Quality can be demonstrated by reviewing quality standards, plans, and quality control data from survey reports. Validation of past data sets can also be conducted using today's standard approaches. USACE uses its Radiological Data Validation procedure to assess the quality of radiological data [2]. USEPA data validation guidance is used for chemical data [3]. The Multi-Agency Radiological Laboratory Analytical Protocols (MARLAP) guidance is also utilized by USACE [4].

Data type is typically easily assessed by comparing the ROD criteria units of measurement (e.g. pCi/g) to the past data units. Occasionally data must be converted to ROD units by simple conversion factors or by modeling. An example of modeling is to convert the ROD criteria into exposure rate data to compare to past data (regulator acceptance of this process is strongly suggested).

Sufficient data may also be easily addressed by performing the required sample number calculations in MARSSIM and comparing to past data. Statistical power and probability graphing can also be done per MARSSIM. Occasionally, past remediated areas are small and data is limited. An evaluation of the site conceptual model to determine if use of MARSSIM guidance on SU with areas less than 100 square meters is appropriate could then be conducted.

Accounting for elevated sample results is a more challenging task. Again a review of the Site conceptual model should be conducted to determine if use of the MARSSIM Elevated Measurement Criteria is appropriate. The reviewer may also choose to limit all data to the ROD

criteria and recommend further remediation. Given that most VP, remediated prior to use of CERCLA, were addressed in reports and property owners received letters stating their properties were cleaned, some approach to elevated data should be taken. USACE typically finds that the MARSSIM EMC approach is acceptable.

### **Data and Evaluation Reporting**

Given the FUSRAP and its 30 plus years of existence, a variety of information exists on facilities and VPs. This information is available through the DOE Office of Legacy Management, national archives, local libraries, State agencies, and various government data repositories. Much of the data available may not suffice to evaluate a VP technically, as discussed above, but may be useful in better defining a Conceptual Site Model (CSM) (including VPs). The CSM may then lead to conclusions regarding a specific data needs for a VP. As an example, reports with flyover, drive by, and walking gamma scans are examples of data that can be used to determine if further information is necessary or not to evaluate a VP. Historical aerial photography, insurance maps, as built drawings, and other non analytical data are other examples of data which can be used to develop a CSM.

To date USACE has utilized a Technical Memorandum to document the evaluation of the remediations of past VPs and to present all data for a property. The use of TMs has facilitated internal USACE and regulator reviews as well as providing information on how to move forward. Given the possible evaluation outcomes (meets ROD, requires additional investigation, or requires additional remediation), CERCLA documentation (Investigation Reports, Remedial Action Reports, etc.) can then be prepared.

### **CASE SPECIFIC DISCUSSIONS**

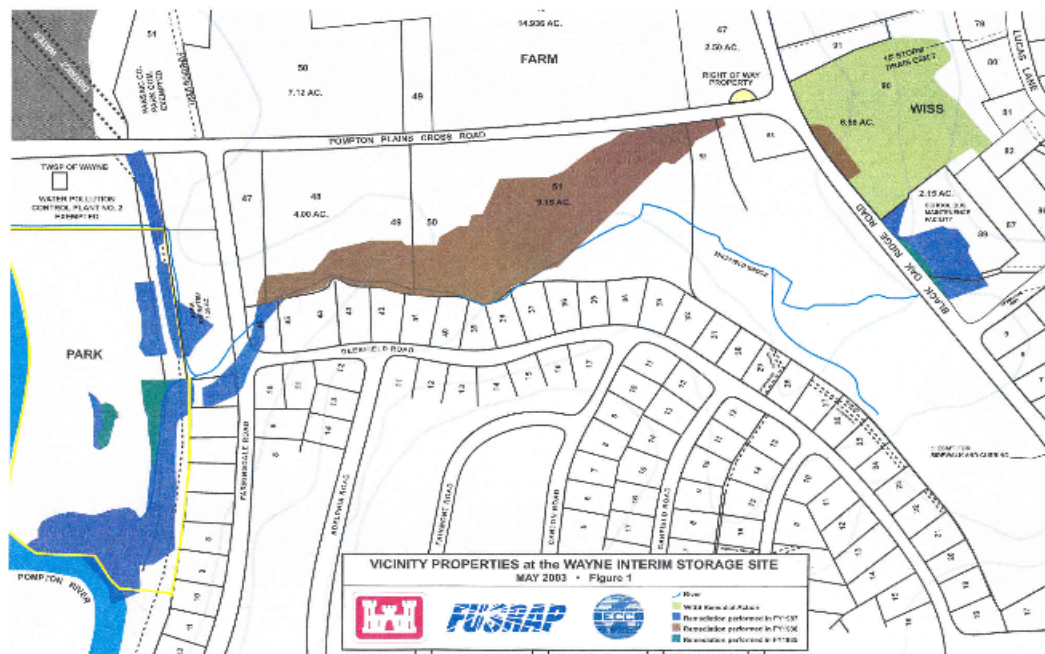
As USACE is conducting reviews of previously remediated VPs a process for performing these assessments is forming, minimal data requirements are realized, and how to best utilize the information is becoming apparent.

#### **Wayne Interim Storage Site**

At the Wayne Interim Storage Site (WISS) FUSRAP Site in Wayne, New Jersey, the USACE, in preparation for closeout of the Site and as required for NPL delisting, conducted a review of 70 VPs. All survey, characterization, remedial action, and independent verification reports for previous work done at the WISS VPs was reviewed. This evaluation work was done post ROD. The review was to evaluate whether prior actions at the VPs were sufficient to meet the cleanup criteria specified in the current ROD. The Site was transferred to the Federal Government in the early 1980's. Prior actions at the VPs included fly over surveys and limited sampling. Once identified as requiring further action, characterization surveys and remediation were conducted. The subsurface soil cleanup criteria that was applied during remediation, however, was less stringent than the unrestricted land use criteria specified in the WISS ROD.

The USACE reviewed all available historic data and removed from further consideration any property that indicated an anomaly not attributed to the WISS or former thorium production. Properties originally recommended for characterization and remediation were compared to the lists of properties remediated to ensure completeness. Post remedial action reports and verification reports for each remediated property were then reviewed. Final status survey data and verification data were then compared to the USACE ROD criteria for the Wayne Interim Storage Site and the protocol presented in MARSSIM was applied to demonstrate compliance to the ROD cleanup criteria. On the basis of this review, USACE found that all but four properties demonstrated compliance with the current site ROD. Of these four, one had insufficient subsurface data, one failed to meet the current criteria, and two had isolated areas of elevated measurements that required further investigation. In an effort to further evaluate the properties that did not meet the ROD criteria, a preliminary comparison was made to exposure scenarios described in the WISS Feasibility Study and then to the applicable and substantive requirements of the New Jersey Administration Code. All four properties were found to likely meet the NJAC dose limits for their current land use.

Following the review, evaluation, and additional sampling, USACE determined that prior actions were sufficient to meet the ROD criteria at all but two vicinity properties. USACE conducted additional excavation and off-site disposal of contaminated residual soils at these properties consistent with the selected remedy in the ROD (Figure 1).



**Figure 1. Wayne Interim Storage Site Vicinity Properties**

The VPs were addressed by going thru the Explanation of Significant Difference (ESD) process and adding them to the ROD in that manner. A technical memorandum was also prepared [5]. This facilitated the project close out as a separate CERCLA process for VPs was not required.

## Maywood Interim Storage Site

At the FUSRAP Maywood Superfund Site (FMSS) in Maywood, New Jersey the VP assessment is also required for delisting. The Site was transferred to the Federal Government in the early 1980's. At this Site, the Environmental Protection Agency (EPA) 5-Year Review also raised some questions that warranted looking at the previous VP work. The VP assessment was done post ROD (2003 for Soils and Buildings).

A total of 88 designated properties were included in the official NPL listing for the FMSS. Of these properties, 64 were designated as Phase 1 and were addressed by the Federal Government under Removal Actions and 24 were designated as Phase 2 and were addressed under a soils ROD (Figure 2). These properties were all evaluated by the VP assessment. The assessment also included an additional 271 properties that were labeled as Phase 3 and not designated as part of the FMSS. All properties were compared to the ROD.

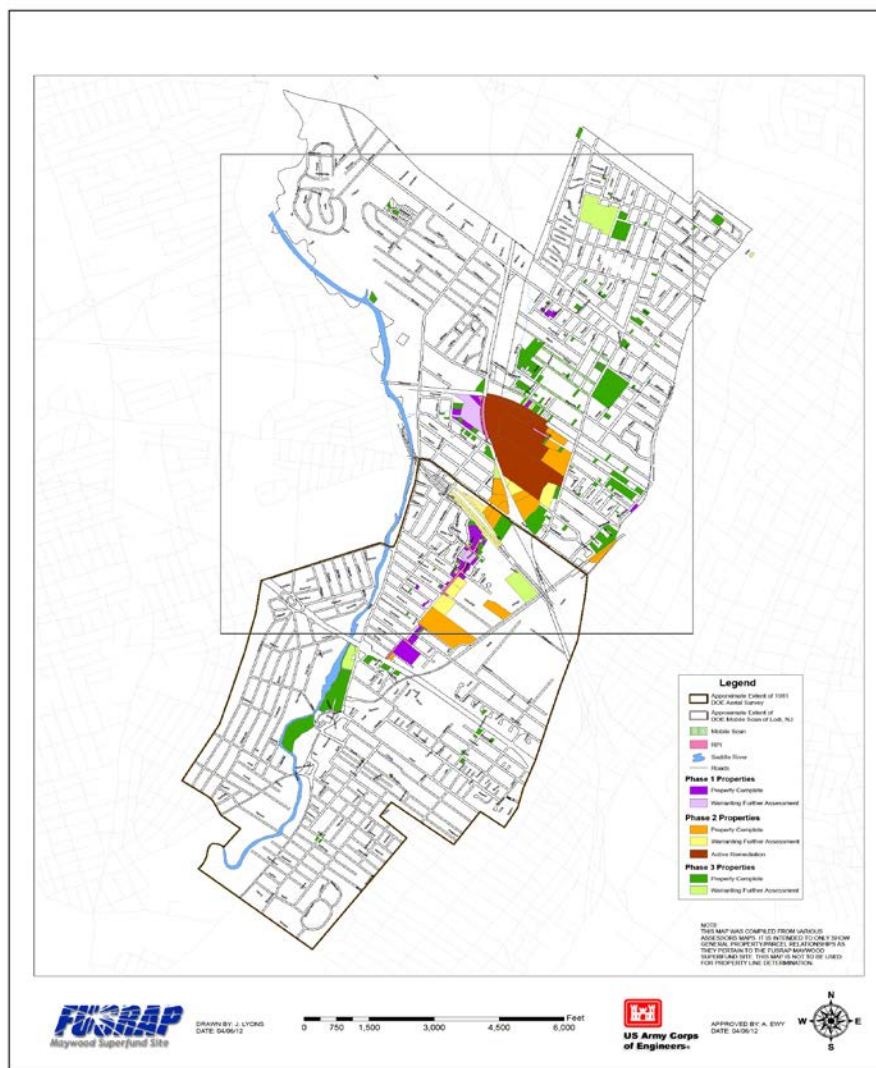


Figure 2. FUSRAP Maywood Superfund Site Vicinity Properties

The assessment process at the FMSS involved review of all survey, post remedial action, characterization, and verification reports for all properties. This review identified many properties with limited data, such as solely gamma scan data. Data that was available was compared against current ROD by evaluating exposure rate, soil screening data, soil lab data, isotopic data, and rare earth data. Some properties were found to meet the current ROD criteria and were eliminated from further evaluation. A number of properties were also eliminated based on their non-FUSRAP characteristics, determined by Th-232 to Ra-226 ratios, rare earth data, U-238 to U-234 ratios, and field log book data (natural sources identified).

The assessment process identified 20 properties as requiring further investigation/work. Of these 20, 9 were previously remediated and considered clean. An additional 7 have known remaining inaccessible contamination. The majority of the property owners for Phase 1 and Phase 3 properties were given 'clean' letters by the Government decades ago, adding a level of sensitivity that must be considered. The further investigation that is warranted will likely consist of additional gamma scanning, additional soil sampling, data evaluation, and may possibly lead to additional remediation. It is expected that the majority of the properties warranting further investigation will meet the ROD criteria once additional data is collected. Those properties that do require additional remediation could be addressed under an ESD, although the project team is not at the point of making that decision yet. Maywood Property Assessment Technical Memorandum [6] and VP Investigation Workplan was approved by regulators during Oct 2013.

### **Colonie Interim Storage Site**

The Colonie FUSRAP Site was transferred to the Federal Government in the early 1980's. In October 1983, the government performed detailed radiological surveys designed to locate those VPs on which uranium concentrations exceeded the cleanup guidelines agreed upon by the State of New York and DOE. These surveys identified 56 VPs that required cleanup. Soil removal activities at 53 of the 56 VPs in 1984, 1985 and 1988. Two of the three remaining VPs (Town of Colonie Property and the CSX (formerly Conrail) Railroad Property) were subsequently cleaned up during removal actions conducted by USACE, along with the main Site soils. The third remaining VP, Niagara Mohawk (NiMo) Electrical Power Substation, did not require remediation. In 1985 the DOE acquired a portion of the NiMo property bordering the Colonie Site and subsequently designated it as part of the Colonie Site. From 1992 to 1996, the remaining NL Site buildings were demolished. By the end of 2007, USACE had completed the removal of contaminated soils at the main Site and the remaining three VPs.

The USACE evaluation of the historic VP work stated by comparing properties originally recommended for characterization and remediation to the lists of properties remediated to ensure completeness. Post remedial action reports and verification reports for each remediated property were then reviewed. Final status survey data and verification data were then compared to the proposed ARAR for soils and TBC for surface areas and the protocol presented in MARSSIM was applied in the development of the Colonie Site FSS Plan and Addendum for the CSX VP. On the basis of this review, USACE found that two individual properties had residual surface contamination on roofs, above the criteria. The 53 VPs remediated in the 1980's met the objectives of the remedial action and met the proposed ARAR and TBC's for the Colonie

FUSRAP site, and met the intent of today's MARSSIM guidance. Vicinity Property assessment work is documented in a technical memorandum for the Colonie Site [7].

### **Middlesex Sampling Plant**

The VP Assessment process has also recently been started for the Middlesex Sampling Plant (MSP) Site in Middlesex, New Jersey. The evaluation for this NPL site is planned to address approximately 35 VPs and will be conducted similar to the Case Examples presented above.

### **CONCLUSION**

As the public pressures, regulations, and processes that the FUSRAP encounters continue to change, the program itself continues to evolve. Review of previously identified VPs is required for a number of reasons. FUSRAP work was not performed under CERCLA Records of Decision (ROD) until Corps involvement. The ROD identifies the remedy decision and ultimately the criteria to be used to release a site. Early FUSRAP projects used DOE Orders or the Uranium Mill Tailings Radiation Control Act (UMTRCA) standard as ARARs. Under current RODs, ARARs may differ, resulting in different cleanup criteria. VP reviews are also required for National Priorities List (NPL) delisting of a site and to assess data limitations. Assessment of VPs at FUSRAP sites is a necessary step in the lifecycle of our site management.

### **RECOMMENDATION**

USACE should document or standardize its approaches to past remediated VPs by preparing guidance for FUSRAP project managers and contractors to consider.

### **REFERENCES**

1. EPA 2000, Multi-Agency Radiation Site Survey and Investigation Manual (MARSSIM), EPA 402-R-97-016, Rev. 1. August 2000.
2. USACE 2004, USACE Kansas City and St. Louis District Radionuclide Data Quality Evaluation Guidance For Alpha and Gamma Spectroscopy, Rev 1. June 2004.
3. USACE 2006, Kansas City District Data Quality Evaluation Guidance, Rev February 2006.
4. EPA 2004, Multi-Agency Radiological Laboratory Analytical Protocols Manual, EPA 402-N-04-001A. July 2004.
5. USACE 2003, Technical Memorandum Summary of the Vicinity Property Assessment, Wayne Interim Storage Site, Wayne, New Jersey. July 2003.
6. USACE 2013, FUSRAP Maywood Superfund Site Property Assessment Technical Memorandum. August 2013.



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7. USACE 2010, Technical Memorandum, Vicinity Property Assessment, Colonie FUSRAP Site, Colonie, New York, Revision 1. October 2010.