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OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

OSWER 9200.3-75

MEMORANDUM

SUBJECT: Transmittal of the *National Strategy to Expand Superfund Optimization Practices from Site Assessment to Site Completion*

FROM: James E. Woolford, Director
Office of Superfund Remediation and Technology Innovation (OSRTI)

TO: Superfund National Policy Managers (Regions 1 – 10)

The purpose of this memorandum is to transmit *the National Strategy to Expand Superfund Optimization Practices from Site Assessment to Site Completion* (Strategy). The Strategy was jointly developed by OSRTI, the regions, and representatives from the Office of Research of Development (ORD).

The goals of the Strategy are to expand and formalize optimization practices as an operating business model for the Superfund remedial program (remedial program) and to fulfill Action 10 of the Office of Solid Waste and Emergency Response Integrated Cleanup Initiative (ICI): *Opportunities to Provide Greater Support in Optimizing Cleanup of Superfund Sites*. The Strategy envisions the application of optimization concepts throughout all phases of the remedial pipeline as a normal part of remedial program activities. To facilitate that process, as part of Contracts 2010, the remedial program will modify contracts to allow for greater opportunities for optimization. Furthermore, it is expected that the regions review all Fund-lead sites for optimization opportunities by the end of fiscal year 2013. To assist regional offices with part of this effort, OSRTI will accept nominations for independent optimization studies on an ongoing basis. All nominations should be sent to Kathy Yager (yager.kathleen@epa.gov) or Dan Powell (powell.dan@epa.gov).

If you have any questions or comments please contact Jeff Heimerman at (703)603-7191 or heimerman.jeff@epa.gov.

Attachment

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September 2012
Office of Solid Waste and Emergency Response
Office of Superfund Remediation and
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National Strategy to Expand Superfund Optimization Practices from Site Assessment to Site Completion

NOTICE AND DISCLAIMER

This document presents the U.S. Environmental Protection Agency's National Strategy to expand and formalize optimization practices from site assessment to site completion as an operating business model for the Superfund remedial program. The document contains information designed to be useful for interested stakeholders including governments, the public and the regulated community. Mention of trade names or commercial products does not constitute endorsement or recommendation for use. This document was subjected to the Agency's administrative and expert review and was approved for release as an EPA document. This document provides topical introductory information rather than guidance and does not impose legally binding requirements, nor does it confer legal rights, impose legal obligations, implement any statutory or regulatory provisions or change or substitute for any statutory or regulatory provisions. EPA recommends that users refer to applicable regulations, policies and guidance documents regarding selection of cleanup remedies and implementation of cleanup actions; selected references and additional resources are provided in this document. The Agency notes that this is a living document that may be revised periodically without public notice. The EPA welcomes public comments on this document at any time and will consider those comments in any future revisions of this document.

This document can be obtained from the EPA's Integrated Cleanup Initiative (ICI) website at www.epa.gov/oswer/integratedcleanup.htm, the EPA's Hazardous Waste Clean Up Information (CLU-IN) Remediation Optimization website at www.cluin.org/optimization or the EPA's Remedy Optimization website at www.epa.gov/superfund/cleanup/postconstruction/optimize.htm.

For additional information about the EPA's National Optimization Strategy or strategies for conducting an optimization review, interested parties may contact Kathy Yager (617-918-8362 or yager.kathleen@epa.gov) or Kirby Biggs (703-823-3081 or biggs.kirby@epa.gov) of the EPA's Office of Superfund Remediation and Technology Innovation (OSRTI), Technology Innovation and Field Services Division (TIFSD).

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Appreciation is extended to the EPA Remedial Project Managers (RPM), States, Potentially Responsible Parties (PRPs) and other stakeholders that have been involved in prior optimization evaluations and efforts.

National Strategy to Expand Superfund Optimization Practices from Site Assessment to Site Completion

September 2012

Purpose

This National Strategy (Strategy) institutes changes to Superfund remedial program business processes to take advantage of newer tools and strategies that promote more effective and efficient cleanups.[1] The Strategy identifies several objectives to achieve verifiably protective site cleanups faster, cleaner, greener and cheaper. The objectives deploy techniques throughout the life cycle of site cleanup, including site evaluation, construction and operation and maintenance. Many of these approaches have been applied for years at a subset of sites under the U.S. Environmental Protection Agency's management as well as sites managed by other federal and state programs. The body of knowledge on applied optimization techniques and their use throughout the cleanup life cycle is substantial and growing rapidly. When applied consistently and systemically to site management, these techniques and the decisions they generate show a significant return on investment. The U.S. Navy reports a return of greater than 6:1.[2] The Strategy envisions iterative efforts by regions to pursue cost-effective expenditure of Superfund dollars; lower energy use; reduce carbon footprint; improve remedy protectiveness; improve project and site decision making; and accelerate project and site completion.

This Strategy builds on a long history of successful practices and integrates different optimization technical support efforts. It capitalizes on the benefits of optimization through multiple processes including: work planning, communicating, training, implementing, measuring and cost accounting. As part of this Strategy, the Office of Solid Waste and Emergency Response (OSWER) expects regions to systemically apply optimization concepts throughout all phases of the remedial pipeline as a normal business practice.

Background

For more than a decade, the Office of Superfund Remediation and Technology Innovation (OSRTI) has provided technical support to the EPA regional offices through the use of independent (third party) optimization reviews at Superfund sites. In addition, OSRTI staff have worked directly with regional staff and management to improve the efficiency and cost effectiveness of our remedial work. To date, OSRTI has conducted more than 120 optimization reviews at Superfund sites nationwide through Remediation System Evaluation (RSE) and Long-Term Monitoring Optimization (LTMO) reviews.[3] Regions also have performed optimization

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[1] This Strategy fulfills Action 10 of the Office of Solid Waste and Emergency Response (OSWER) Integrated Cleanup Initiative (ICI): "Opportunities to Provide Greater Support in Optimizing Cleanup of Superfund Sites" *www.epa.gov/oswer/integratedcleanup.htm). To align with the ICI, this Strategy is intended to be implemented by* the end of Fiscal Year (FY) 2012.

[2] Naval Facilities Engineering Command (NAVFAC), *"Guidance for Optimizing Remedy Evaluation, Selection, and Design,"* UG-2087-ENV, March 9, 2010.

[3] For more information on RSE and LTMO, refer to www.cluin.org/optimization.

reviews at a portion of their sites. Although the majority of optimization technical support has been applied to Fund-lead Long-Term Response Action (LTRA) sites, OSRTI also has conducted optimization efforts during remedial investigation/feasibility study (RI/FS), remedial design (RD) and remedial action (RA); in support of preparing Five-Year Reviews; at Potentially Responsible Party (PRP) sites; and at state-lead sites.

OSRTI also has provided technical support to regions and other stakeholders in two areas that are closely related or complementary to optimization – Green Remediation and the Triad Approach. Green Remediation is *"The practice of considering all environmental effects of remedy implementation and incorporating options to minimize the environmental footprint of cleanup activities."*[4] The principles of the Triad Approach include systematic project planning, dynamic work strategies and use of real-time measurement technologies and incorporate many of the lessons learned from optimization reviews.[5] The goals of the Triad Approach are similar to those of optimization because Triad's goals also support protective and cost-effective remedial strategies.

The key components of optimization have been used to perform more effectively the activities necessary to build and refine the conceptual site model (CSM), design and construct more effective remedies and demonstrate that a site meets cleanup criteria for protectiveness determinations and ultimately site completion. The benefits derived from these optimization strategies have included: more cost-effective expenditure of Superfund dollars; lower energy use; reduced carbon footprint; improved remedy protectiveness; improved project and site decision making; and acceleration of project and site completion. Completed optimization reviews at Superfund sites (predominantly in the post construction phase) have identified over 1,000 recommendations to improve protectiveness; improve the understanding of site conditions; and identify concrete opportunities to reduce costs associated with components of the remedy.

Other federal agencies, such as the Department of Defense (DoD), have implemented similar optimization programs to provide independent reviews. The U.S. Air Force and the U.S. Navy each developed national optimization programs and services addressing sites from the site assessment (SA) through site completion stages. Since 1999, OSRTI personnel have engaged in substantive technical and program exchanges with DoD to learn about the structure, processes, benefits and lessons learned of these optimization programs. OSRTI incorporated various successful elements from these programs and services into the Strategy, and DoD has in turned borrowed from the EPA.

Benefits and Approach

OSWER anticipates many benefits from developing and implementing optimization throughout the Superfund remedial process. These include accelerating achievement of environmental results contained in the 2011-2015 EPA Strategic Plan (Strategic Plan) and key Government Performance and Results Act (GPRA) goals which can be downloaded at the following location

[4] For more information on Green Remediation, refer to www.cluin.org/greenremediation.

[5] For more information on the Triad Approach, refer to www.triadcentral.org.

(www.epa.gov /ocfo/budget/2010/fy_2010_annual_plan.pdf). A major goal of the Strategy is to perform optimization reviews as early in the project pipeline as possible, thus realizing immediate benefits that will carry through a project's life cycle. In addition, the Strategy promotes an optimization-oriented focus at subsequent pipeline stages to ensure that maximum benefits are achieved wherever possible. Other benefits anticipated include, but are not limited to:

- Achieving better and more cost-effective site characterization;
- Improving remedy evaluation and selection;
- Improving remedy protectiveness;
- Improving alignment of site activities with site remedial action objectives (RAOs);
- Reducing costs;
- Providing information to assist with the preparation of Five-Year Reviews;
- Proactively identifying potential impediments to site completion;
- Accelerating project and site completion;
- Addressing community concerns related to site cleanup;
- Incorporating newer and greener technologies into site cleanups;
- Providing site teams with tools and strategies for more effective site decision making;
- Building consensus among site stakeholders;
- Providing independent technical input that cross-pollinates expertise among sites;
- Improving data and information management practices; and
- Improving timeliness, utility and objectivity of data in decision-makers' hands.

The Strategy unifies previously independent optimization efforts (such as RSE, LTMO, Triad, Green Remediation, and other *ad hoc* site consultations) under the singular activity and term "optimization," which can be used to support decision making throughout the Superfund project pipeline from SA to site completion (See Figure 1). Furthermore, for those sites in early planning of the SA stage, the Strategy seeks to utilize optimization lessons learned and practices through similar technical support mechanisms. The Strategy also encourages activities designed to facilitate better site characterization, remedy selection and design and remedy construction by applying various techniques and optimization lessons learned to improve a given project's scope, schedule and cost.

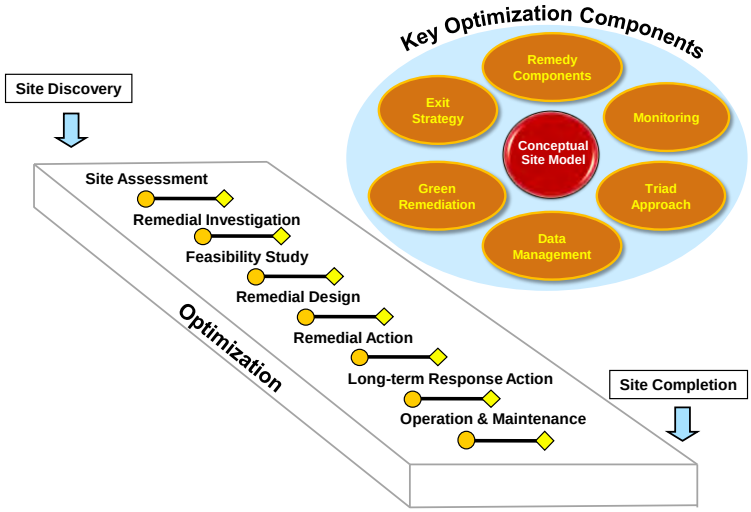
Optimization in the context of this Strategy is defined as:

"Efforts at any phase of the removal or remedial response to identify and implement specific actions that improve the effectiveness and cost-efficiency of that phase. Such actions may also improve the remedy's protectiveness and long-term implementation which may facilitate progress towards site completion. To identify these opportunities, regions may use a systematic site review by a team of independent technical experts, apply techniques or principles from Green Remediation or Triad, or apply other approaches to identify opportunities for greater efficiency and effectiveness."[6]

[6] The EPA encourages contractors, states, tribes, the public, and PRPs to propose specific opportunities to improve protectiveness and efficiency for the Agency to consider.

Figure 1 depicts the key components of optimization and the remedial pipeline phases at which optimization can be applied.

Figure 1. Optimization Tools Applied to Cleanup Activities from Site Assessment to Site Completion



Elements of the National Optimization Strategy

Development of the Strategy involved a collaborative process with the regional Superfund Programs, OSRTI and the Office of Research and Development (ORD). The Strategy is built on successful existing strategies, coordination with similar optimization technical support efforts and expansion of optimization reviews to more sites and all phases of the remedial pipeline. The following elements form the basis of development and implementation of the Strategy:

- Element 1: Planning and Outreach
- Element 2: Integration and Training
- Element 3: Implementation
- Element 4: Measurement and Reporting

Element 1: Planning and Outreach

Element 1 involves a series of planning and outreach efforts to document Strategy goals, apply optimization to improve community engagement, nominate sites for optimization and coordinate with related efforts.

1.1 Establish Strategy goals

As this Strategy has evolved, it has been important to engage in a planning process and to develop quantifiable goals that align with the 2011 – 2015 EPA Strategic Plan. Through this planning process, priorities and needs have been identified and incorporated into the following overarching goals of the Strategy:

- Incorporate optimization experience and principles in remedial program business practices including:
  - Assessment of site cleanup progress, site technical performance and costs
  - Regional/OSRTI work planning and reviews
  - Implementation of acquisition strategies and contracts management practices
- Collect, synthesize and share optimization lessons learned;
- Apply optimization practices earlier and throughout the remedial pipeline;
- Increase the number of optimization reviews supported by OSRTI to 20 to 30 sites annually; and
- Measure optimization outcomes and report results.

OSRTI and the regions worked collaboratively to implement initial Strategy elements as of the end of Fiscal Year (FY) 2012.[7] OSWER expects that by the end of FY 2013 the regions will review all remaining Fund-lead sites for optimization opportunities and will continue to evaluate optimization opportunities at new sites that come under the EPA's management.

Lead: OSRTI and National workgroup

1.2 Apply optimization as a means to improve community engagement

Optimization can be instrumental in providing structure and tools to improve communication with communities, local stakeholders, regulatory agencies, tribes and PRPs. Below are a number of examples of how optimization can and has been used to facilitate or improve community involvement and communication:

1.2.1 *Triad Approach*. Efforts to advance site management strategies that help to more fully characterize sites and to increase confidence in the understanding of the extent, location and behavior of contamination can help communicate site conditions and progress to stakeholders. See www.triadcentral.org for more information.

1.2.2 *Remediation System Evaluations* (RSE) and *Long-Term Monitoring Optimization* (LTMO). The use of optimization practices to address stakeholder concerns and provide information on the protectiveness and efficacy of remedies may provide more confidence to communities that remedies are and remain protective. See www.cluin.org/optimization for more information.

1.2.3 *Green Remediation*. Reducing the environmental footprint of remedies through environmental footprint reviews helps stakeholders understand the potential effects of remedies on their environment and project teams to understand and minimize those effects. See www.cluin.org/greenremediation for more information.

[7] Optimization reviews are being conducted concurrently with the development and implementation of the Strategy.

1.2.4 *Knowledge Transfer*. Current information resources and infrastructure, provided through www.epa.gov/superfund and www.cluin.org and the Technology Innovation and Field Services Division's (TIFSD) Internet seminars, provide a great deal of readily available and accessible information to stakeholders. In addition, OSRTI, regions and ORD have subject matter experts who can assist regions with community meetings related to site characterization and cleanup.

1.2.5 *Training*. OSRTI's CERCLA Education Center (CEC) and the Environmental Response Training Program (ERTP) support desired training for the EPA and state regulators, tribes and other government stakeholders, and could emphasize (and, if necessary, strengthen or update) the stakeholder outreach curricula in "process" classes. See www.trainex.org for more information.

OSRTI Lead Divisions: Assessment and Remediation Division (ARD)/TIFSD

1.3 Identify projects and sites for optimization

A collaborative process between OSRTI and the regions is being used currently to identify sites or site projects that would benefit from an optimization review. Regions determine which sites may warrant an independent optimization review and, as applicable, request optimization support from the headquarters (HQ) team. Support can be provided by OSRTI, regional or ORD resources. The following are examples of general criteria that suggest an optimization review may be beneficial:

- Desire to accelerate or improve effectiveness of the remedial process;
- Opportunities to reduce cumulative project costs;
- Options for handling funding constraints;
- Transition of projects between entities (for example, before a Fund-lead site transfers to a state);
- Achieving Environmental Indicators (such as Human Exposure Under Control (HEUC) and Groundwater Migration Under Control (GMUC));
- Supporting an upcoming Five-Year Review; and
- Addressing Five-Year Review recommendations.

Other government stakeholders (such as states, tribes and local governments) and communities may initiate a request for optimization technical support through their respective EPA regions. Based on regional determination and available resources, OSRTI, ORD and regions may provide the requested technical support.

In FY 2013, all regions are expected to review their active Fund-lead sites to identify candidates for potential optimization reviews. This requirement will be outlined in a memorandum to the regions by the end of November 2012. This effort will also be discussed in all OSRTI/Regional work planning meetings.

Leads: OSRTI and Regions

1.4 Coordinate with complementary technical support efforts

Existing optimization efforts support established remedial program goals. Optimization reviews support the National Remedy Review Board (NRRB), Contaminated Sediments Technical Advisory Group (CSTAG), Value Engineering (VE), program measures such as construction completion, operational and functional, Site-Wide Ready for Anticipated Use (SWRAU), HEUC, GMUC and other program requirements such as Five-Year Reviews and LTRA transfer.

This element also involves coordinating with key related EPA workgroups and proposing strategies to connect optimization and avoid conflicts with their efforts. Key workgroups include the subgroups of the Technical Review Workgroup (TRW), Groundwater Forum, Engineering Forum, Federal Facilities Forum and the National Association of Remedial Project Managers (NARPM).

OSRTI Lead Division: ARD/Resource Management Division (RMD)

Element 2: Integration and Training

Efforts are continuing to fully integrate optimization into program operations through supplementing existing guidance documents (as appropriate); evaluating current incentives for optimization; incorporating optimization language into contracts; and developing a more robust training program.

2.1 Create technical resources to supplement existing guidance and policy, and address optimization in new guidance

OSRTI is organizing existing optimization-related resources to describe how optimization principles, practices and techniques can be utilized with current programmatic guidance, as needed. Existing guidance may be supplemented by directives, technical bulletins, fact sheets and other materials to explain how optimization applies at various stages of cleanup. Furthermore, OSRTI will prepare additional technical resource material (such as training courses, fact sheets and an updated resource center website) as appropriate, based on new findings and lessons learned as the Strategy is implemented. These enhancements to guidance are intended to enable project teams to integrate improved methods and strategies for cleanup learned from previous optimization studies into site characterization, remedy selection and remedial design. OSRTI also is developing standard operating procedures such as project engagement forms, checklists and documentation to facilitate the scoping and conduct of optimization reviews (see Element 3.3 for more information).

OSRTI Lead Divisions: ARD/TIFSD

2.2 Adopt lessons learned into business practices

On a routine basis, optimization lessons learned will be collected, summarized and discussed by OSRTI and regional program and project staff to determine how our business practices (including contracting) can benefit from these lessons learned. In

addition, several program directives (for example, directives related to VE) include contract-specific requirements that could be leveraged.

As part of Contracts 2010 implementation (www.epa.gov/oswer/docs/contracts_2010_strategy_report.pdf), the remedial program will be refining contracts to allow for greater opportunities for optimization. Specifically, OSRTI, working with the Office of Acquisition Management (OAM), will work to add language to task orders, work assignments and contract vehicles to promote optimization. Such language could include incentives regarding performance proposals. Project-specific Statements of Work may likely be the best tool to incentivize or direct contractors to gather and analyze data and trends to evaluate site progress toward the RAOs. Identifying and utilizing these best management practices across sites and regions may be one of the most important objectives of the Strategy.

OSRTI Lead Divisions: RMD/TIFSD/ARD

2.3 Formalize an optimization training program

OSRTI has actively promoted optimization knowledge transfer since optimization activities commenced in the late 1990's. To date, OSRTI has sponsored national conferences on optimization, in-person training events and Internet-based training events; developed many technical documents; presented optimization findings at numerous national conferences; and provided site-specific support. OSRTI has specifically targeted EPA Remedial Project Managers (RPM) and technical staff by participating in and developing training courses for NARPM training and Technical Support Project (TSP) meetings. However, this training was developed and offered on an *ad hoc* basis and all facets of optimization were not consolidated into a formal, unified training program. The goal of the training sub-element is to review training needs associated with the Strategy, consolidate existing training material, develop new training as needed, deliver training and ensure that appropriate project and program managers have access to the training material on an ongoing basis (such as via archived training material, CEC and ERTP).

Additional technology transfer and training will be necessary as the Strategy is implemented. The substantial resources already developed are being assembled into a comprehensive optimization training program. Optimization training, supplements to guidance and other technical resources could also be assembled into a unified, organized web presence so that the EPA staff, state personnel, tribal members and contractors can conveniently access technical, policy and training information as needed. Training will provide a number of benefits, including, but not limited to:

- Increased knowledge of optimization practices and tools for all participants;
- National consistency in the quality of, approach to and outcomes of optimization efforts;
- An anticipated increase in the number of sites that are recommended for optimization; and
- Expansion of region-led optimization efforts.

OSRTI Lead Division: TIFSD/ARD

Element 3: Implementation

Element 3 involves implementing the Strategy based on the goals established through the planning process. Implementation involves conducting optimization reviews at all stages of the project pipeline beginning with SA; incorporating Triad, Green Remediation and other best practices; providing access to a pool of qualified optimization contractors; developing the capabilities of regions and other stakeholders; and advancing the application of innovative optimization strategies.

3.1 Conduct optimization reviews at all stages of the project pipeline beginning with site assessment

The optimization program is being implemented based on the strategic goals identified in Section 1. The remedial program has established a target goal of OSRTI providing independent optimization reviews to 20 to 30 sites per year for 3 years, after which a joint OSRTI/regional review of the optimization program is proposed to determine whether the number of sites should be maintained, increased or decreased. The actual number of sites optimized in any year, however, relies upon annual budget appropriations.

3.2 Expand optimization to earlier project pipeline stages and incorporate Triad, Green Remediation and other best practices

Although optimization has historically been applied primarily to sites with operating remedies, through this Strategy OSRTI is expanding optimization to sites earlier in the Superfund project pipeline, including SA, remedial investigation (RI), feasibility study (FS) and RD.

Optimization at these cleanup stages may consist of equivalent independent reviews that employ strategies such as the Triad Approach and will be informed by lessons learned from historical and ongoing optimization reviews. Some sites in the early phases of work may not have sufficient information to complete independent optimization reviews but instead can receive technical assistance in applying the latest analytical methods, sampling tools and project management strategies. The Strategy encourages the application of lessons learned from optimization reviews to all of these Superfund project pipeline activities. Furthermore, Green Remediation environmental footprint evaluations should be integrated into optimization reviews, where appropriate, to identify opportunities to further optimize site activities, while reducing the impact of characterization and remedial efforts on the environment. Finally, optimization efforts should integrate best practices from across the remedial program.

3.3 Independent party optimization review steps

After a site is identified for optimization, an optimization team is assembled consisting of independent experts with relevant qualifications tailored for each site's needs. Efforts are made to inform and include all stakeholders (such as regional management, site owners, PRPs, states, tribes, local governments, communities and others), as they may have a vested interest in optimizing site performance. Regional management will be informed regularly on the status of an optimization project when OSRTI is involved and will receive copies of draft final optimization review reports. With completion of each review

there will be a senior management briefing to discuss the results, any potential impediments to implementing recommendations and the path forward for the site.

To initiate an independent party optimization review, key site data are identified and transferred to the optimization team for evaluation. Pipeline stage and the quantity and quality of data will be significant factors in establishing the nature and goals of the review. Optimization reviews typically are conducted through a series of conference calls or web conferences and a site visit (as appropriate) to collect and evaluate appropriate site data. For optimization reviews performed at some sites, follow-on technical support may be appropriate to fill gaps necessary to fully evaluate site or project conditions and to further develop strategies for implementing the recommendations. Numerous existing technical documents describe the steps involved in an optimization review.[8]

OSRTI has also developed several new documents to establish a consistent and standardized approached to implementing optimization reviews. These documents will be available in electronic format at www.cluin.org/optimization and include:

- An optimization standard operating procedure;
- An optimization primer and overview;
- An optimization engagement form;
- Management notification emails; and
- A template optimization report.

OSRTI Lead Divisions: TIFSD/ARD

3.4 Provide access to a pool of qualified, independent contractors

OSRTI has access to technical experts who perform the majority of EPA optimization reviews and are currently available to perform optimization reviews. Experts currently available include OSRTI staff, OSRTI mission support contractors, Argonne National Laboratory and the U.S. Army Corps of Engineers (USACE). Regions also have used Remedial Action Contract (RAC) contractors to perform optimization reviews. OSRTI's experience confirms that it is critical to use only highly qualified technical experts. Optimization involves the synthesis and analysis of a significant quantity of data in a limited time frame and budget. To accomplish optimization objectives, contractors must have demonstrated qualifications and the capacity to accomplish these goals on highly challenging, unique and complex sites across the country.

As part of the Strategy, in the future it may be beneficial to expand the pool of experts available to OSRTI and the regions to perform optimization reviews. Regions also can perform optimization reviews through regional acquisition mechanisms (for example, RAC and USACE) or through "buy in" to existing OSRTI contracting and Inter-agency Agreement mechanisms. A variety of national and regional contracting strategies are

[8] For more information on how to conduct optimization reviews refer to www.cluin.org/optimization or www.frtr.gov/optimization.

currently being evaluated to ensure OSRTI and regional access to optimization review resources.

OSRTI Lead Divisions: TIFSD/ARD/RMD

3.5 Develop regional optimization capabilities

To fully integrate optimization into the remedial program, regional offices have been involved in planning and implementing optimization at all stages of the remedial process. Involving regional offices is helping to establish an expanded pool of EPA staff knowledgeable of optimization approaches, benefits and complications. Direct involvement of regional staff is also essential to the selection of sites for optimization, subsequent oversight of optimization reviews and implementation of recommendations. Each region has identified an "Optimization Liaison" who serves as the primary point of contact for the region for selecting sites, assisting with completing optimization studies and interfacing with OSRTI on all aspects of implementing the Strategy in that region.

Regions worked with OSRTI to develop and finalize the Strategy and continue to identify and select high-priority sites; oversee optimization reviews; review optimization reports; track progress toward implementation; and report results. OSRTI assists in site prioritization and selection, as appropriate, provides access to independent optimization contractors, collects and analyzes reported results, and measures outcomes. OSRTI also will assist regions in assessing funding sources for implementation of optimization recommendations at Fund-lead sites. As needed and as resources will allow, OSRTI will provide technical support during implementation, irrespective of a site's funding source.

OSRTI will continue managing contractor site optimization review efforts until at least the end of FY 2013. Over time, regions are anticipated to become increasingly involved in performing optimization studies. Continued use of OSRTI's current optimization technical support strategy and resources will help ensure optimization reviews are performed with consistency by contractors who are qualified and independent, while also reducing the contracting burden to the regions. Future contracting scenarios could include contracts managed directly by OSRTI with the regions serving as task managers; regions utilizing region-specific contracts; or regions using federal resources via interagency agreements. Regardless of the contracting approach, it is essential to the optimization process that review teams be composed of qualified experts who are independent from the site contractor. Contract language, including statements of work (SOW), will be established for regional use in procuring and managing site optimization contracts and projects. An important component of developing regional optimization capabilities involves training for regional staff, contractors and other EPA stakeholders. Please reference section 2.3 of this document for more information on formalizing an optimization training program.

Leads: TISFD/RMD/Regions/OAM

3.6 Develop other stakeholders' capabilities

All stakeholders, including state project managers, should be included at the outset of optimization reviews, during implementation and during follow-up tracking. It will be

necessary, therefore, to assist some states, tribes, communities and other stakeholders with development of their optimization capabilities, through training as indicated in Element 2.3 and participation in optimization efforts as indicated in Element 3.1.

OSRTI Lead Divisions: TIFSD/ARD

3.7 Advance application of innovative optimization strategies

OSRTI will maintain involvement in innovations in the optimization arena by continuing to participate in ongoing research projects (for example, ORD, DoD's Strategic Environmental Research and Development Program [SERDP] and Environmental Security Technology Certification Program [ESTCP], National Institute of Environmental Health Sciences [NIEHS] Superfund Research Program, Interstate Technology and Regulatory Council [ITRC], national laboratories and universities), performing general tracking of developments by other agencies or the private sector, and encouraging and deploying innovative approaches at Superfund sites.

OSRTI Lead Division: TIFSD

Element 4: Measurement and Reporting

Element 4 involves tracking progress of optimization, measuring outcomes and accounting for related costs.

4.1 Track implementation of recommendations

Two critical components of a successful optimization program include tracking implementation progress and reporting results. Experience has shown that with tracking and reporting, optimization recommendations are more likely to be implemented and benefits realized. Because optimization often results in follow-on work, RPMs will benefit from ongoing involvement by the optimization team to clarify report recommendations, answer questions and identify additional technical support needs.

A process to measure the outcomes of the Strategy is being developed to effectively track implementation of recommendations. Metrics being considered include, but are not limited to, protection of human health and the environment; assistance with achieving program measures (such as operational and functional, acceleration of site completion, and special initiatives such as Green Remediation); and cost impacts (for example, potential cost savings identified, capital costs, cost avoidance, and cost savings realized). At a minimum, the following elements may be considered for each optimization study:

- Status of each optimization recommendation (completed, in progress, declined);
- Cost impacts of each optimization recommendation (capital costs, cost avoidance, cost savings);
- Benefits that resulted from implementation;
- Obstacles encountered during implementation; and
- Other metrics that allow for quantifying optimization results.

To support recommendations and results tracking, a platform for managing, tracking and reporting optimization information is being developed. This platform will facilitate analysis of program effectiveness. With the support of regions, OSRTI will maintain the information tracking system.

OSRTI Lead Divisions: ARD/TIFSD/RMD

4.2 Measure optimization outcomes and report results

Development and implementation of the Strategy and site-specific and program-wide results are anticipated to be summarized and reported regularly. An annual report prepared by OSRTI is proposed for internal and public distribution. The document may include a summary of Strategy goals; a summary of regional optimization review efforts; a site-by-site summary of optimization results; quantified optimization outcomes; lessons learned; and suggestions for improvement.

OSRTI Lead Divisions: ARD/TIFSD

4.3 Monitor cost accounting

Through program measurement and tracking described above, cost expenditures and identified savings will be reported on a regular basis. Cost accounting information can be used to determine whether changes are necessary to ensure that optimization program goals are achieved in the anticipated timeframe. Costs incurred and deliverables prepared by support contractors will be closely tracked to ensure that contract requirements are achieved at reasonable cost to the government.

Leads: RMD/Office of the Chief Financial Officer (OCFO)/OAM

Implementation Schedule

The Strategy proposes to expand optimization to more sites nationwide, with the following three primary milestones:

- Start implementation – second quarter, FY 2011
- Finalize Strategy – end of FY 2012
- Implement Full Strategy – by beginning of FY 2013

ATTACHMENT A – LIST of ACRONYMS

Acronym	Definition
ARD	Assessment and Remediation Division
CEC	CERCLA Education Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	Conceptual Site Model
CSTAG	Contaminated Sediments Technical Advisory Group
DoD	Department of Defense
EPA	U.S. Environmental Protection Agency
ERTP	Environmental Response Training Program
ESTCP	Environmental Security Technology Certification Program
FS	Feasibility Study
FY	Fiscal Year
GMUC	Groundwater Migration Under Control
GPRA	Government Performance and Results Act
HEUC	Human Exposure Under Control
HQ	Headquarters
ICI	Integrated Cleanup Initiative
ITRC	Interstate Technology and Regulatory Council
LTMO	Long Term Monitoring Optimization
LTRA	Long Term Response Action
NARPM	National Association of Remedial Project Managers
NIEHS	National Institute of Environmental Health Sciences
OAM	Office of Acquisition Management
OCFO	Office of the Chief Financial Officer
ORD	Office of Research and Development
OSRTI	Office of Superfund Remediation and Technology Innovation
OSWER	Office of Solid Waste and Emergency Response
PRP	Potentially Responsible Party
RA	Remedial Action
RAC	Remedial Action Contract
RAO	Remedial Action Objective
RD	Remedial Design
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RMD	Resource Management Division
RPM	Remedial Project Manager
RSE	Remediation System Evaluation
SA	Site Assessment
SERDP	Strategic Environmental Research and Development Program
SOW	Statement of Work
SWRAU	Site-Wide Ready for Anticipated Use
TIFSD	Technology Innovation and Field Services Division
TRW	Technical Review Workgroup
TSP	Technical Support Project
USACE	U.S. Army Corps of Engineers
VE	Value Engineering