



Template Scope of Work for Conducting a Remediation System Evaluation

U.S. ARMY CORPS OF ENGINEERS

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Notes to the USACE project staff preparing the scope of work are provided in *[brackets]* and shown in *italics*. Optional language for the scope are provided in *[brackets]* as normal text. Delete the brackets and unused optional text. Note that the template scope of work can be used by a district for contracting with an engineering consultant or developed by an installation to define services to be provided by a district. In all cases, the use of the term “contractor” without modifier (e.g., “well rehabilitation”) refers to the organization performing the remediation system evaluation.

1. Project Objective. The Contractor shall provide all labor, equipment, supplies and materials, and travel necessary to accomplish the following objectives through the performance of the Tasks required in the this contract.

1.1. Purpose of the Remediation System Evaluation (RSE). The RSE is intended to: 1) Verify clear and realistic remediation goals and exit strategy; 2) assess the protectiveness of the remedy in general accordance with EPA guidance on conducting five-year remedy reviews (EPA, 1999); 3) identify cost saving changes in operation or applied technologies and estimate both the costs for implementation of the changes and the probable savings; and 4) evaluate the adequacy of the maintenance of the Government-owned equipment. The contractor shall perform the RSE in accordance with the RSE Instruction Guide [and the Remedial Process Optimization Handbook (phase I and II) (AFCEE, 1999)].

1.2. Remedial Action Objectives and System Operation Criteria. [*Project Specific*]

1.3. [Government Point of Contact. The Government point of contact (POC) for technical issues will be _____. The Government Contracting Officer’s Representative (COR) for this contract is _____.]

2. Project Background. [*Site Specific - Be brief*]

2.1. Site History.

2.2. Record of Decision/Decision Document Summary.

2.3. Construction and Operation History.

2.4. References to be Provided with the Contract. [*Include the RSE Checklists and Instruction Guide, RPO Handbook. Can include Remedial Investigation (RI), Record of Decision (ROD), Plans and Specifications (P&S), Operation and Maintenance (O&M) Manual, O&M Contract, Monthly/Quarterly/Annual Reports, etc. The Contractor will be required to obtain other pertinent documents.*]

3. Personnel Qualifications. The Contractor shall provide personnel that have backgrounds appropriate for the type of technologies used at the site and that meet the following qualifications to perform the site visit and/or data analysis.

3.1. Geotechnical Engineer. The geotechnical engineer shall be a Registered Professional Engineer with a minimum of 5 years experience designing geotechnical features at hazardous waste sites [*specific design experience related to the site features can be required as well*].

3.2. Process Engineer. The process engineer shall be a Registered Professional Engineer with a degree in chemical or environmental engineering with a minimum of 5 years experience designing air, soil, and/or water treatment facilities at hazardous waste sites [*specific design experience related to the site features can be required as well*].

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3.3. Hydrogeologist. The hydrogeologist shall be a Licensed or Registered geologist with a minimum of 5 years experience in hazardous waste site characterization and design of subsurface remediation systems [*specific design experience related to the site features can be required as well*].

3.4. Chemist. The chemist shall have at least a Bachelor's Degree in Chemistry or must possess an equivalent in graduate or undergraduate college chemistry courses and a minimum of 5 years of experience in the development of Sampling and Analysis Plans for site characterization and operational monitoring.

3.4. Regulatory Specialist. The regulatory specialist shall have a minimum of [5] [] years experience in dealing with and negotiating with regulators on CERCLA and RCRA sites.

3.5. Cost Engineer. The cost engineer shall have a Bachelor's degree in the field of civil, structural, environmental, building construction, mechanical, or electrical engineering or in the field of architecture. The cost engineer shall have a minimum of [5] [] years experience in preparing budget or detailed cost estimates for HTRW projects of all types. The cost engineer shall have a experience associated with the development of life cycle cost analyses, value engineering analyses, risk analysis techniques and construction scheduling and shall have experience in using tools such as RACER and MCACES.

4. Task 1 - Data Collection. The Contractor shall obtain the following documents from the [administrative record] [site] [USACE offices] [USEPA offices] [document source located at _____] [locations specified below] if not provided with the Contract. The Contractor shall make copies of the documents indicated below. Costs for reproduction of these documents will be part of the costs for this contract. [Copies of the documents indicated shall also be provided to the USACE POC.] Copies of the documents shall be returned to [USACE] [point of origin for original document] upon completion of the contract. Original documents borrowed for reproduction or performance of the RSE shall be returned within [7][14][30] days of the completion of the final RSE report. The contractor shall maintain an index of documents copied and borrowed for the RSE effort and provide a copy of the index with the draft RSE report. The index shall indicate if a copy or original was obtained. [*The following documents are recommended for collection and review*]

4.1. ROD(s) or comparable Decision Document(s) [*If necessary, note the location of each document, whether an original can be borrowed or if a copy will need to be made. A table containing this information may be helpful.*]

4.2. Plans and Specs, Design Analysis

4.3. Monitoring SAPs

4.4. Periodic Monitoring / Annual Reports, Other Data on Operations

4.5. Current and Past O&M Costs

4.6. Current O&M Contract and all modifications

4.7. Site Characterization Data

4.8. Modeling Reports

4.9. Other Documents [*Specify*]

5. Task 2 - Data Review. The appropriate members of the Contractor's RSE team shall review the various documents to the extent necessary to perform the site visit, interviews, site operational and monitoring data analysis and reduction, and report generation. General guidance for the review of documents by various team members is provided in the General RSE checklist. [*Note that for estimating and negotiation purposes this task should require approximately 24 hours per person for those likely to attend the site visit and approximately 16 hours for those whom*

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will only advise in the preparation of the RSE report. These values are based on the time required by HTRW CX staff for similar tasks during tests of the RSE process.]

6. Task 3 - Coordination and Management. The Contractor shall provide coordination with the following entities for performing the RSEs. The RSE process emphasizes the need to minimize the impact to project and installation personnel, so careful coordination is required. One of the RSE team members actively participating in the RSE shall be designated as the project manager for the RSE and identified to the USACE as such. Brief records of every contact with the entities listed below shall be made by the Contractor's project staff and maintained as part of the project documentation. *[Provide project specific requirements for coordination (e.g., requiring USACE participation on phone calls with specific entities).]*

6.1. With COR. The Contractor shall provide [weekly][monthly] [written][verbal] reports to the USACE COR or his/her designee on the progress of the work, contacts made, and problems encountered. The Contractor shall inform the USACE COR or his/her designee of the anticipated site visit date within [7][14][] days of the site visit or any trips to non-USACE information repositories. The USACE will [not] accompany the Contractor on the RSE site visit. *[It is strongly recommended that the USACE provide a representative for the RSE site visit described in Task 4, if the budget allows.]*

6.2. With Installation/Customer and Operator/Facility. The Contractor shall [not] coordinate directly with the Installation/Customer and Operator/Facility in planning and scheduling the RSE site visit and the interview[s] of Installation/Customer staff and Operators. *[The USACE will coordinate the time for the site visit and interviews.]* *[The point of contact (POC) for the Installation/Customer is _____,] [and the POC for the Operator is _____].* *[The USACE manager should have some sense for the appropriateness of the direct contact between the Contractor staff and the Installation or Customer. It may be more appropriate for the USACE to handle the coordination in order to remain aware of the plans and issues.]*

6.3. With Regulator. The Contractor shall [not] coordinate directly with the Regulator in planning and scheduling the [phone] interview[s] of site Regulator. *[The USACE will coordinate the time for the interviews.]* *[The point of contact (POC) for the Regulator is _____.]* *[The Contractor shall invite the Regulator POC to the RSE site visit. [The USACE manager should discuss the appropriate involvement of the Regulator with the Installation or Customer. It may be more appropriate for the USACE or the Installation/Customer to handle the coordination. If acceptable to the Installation/Customer, the Regulator can participate in the RSE visit. Their participation can, particularly if the relationship with the regulatory agency is generally constructive, expedite and smooth the process of implementing any needed or proposed changes.]*

6.4. With the Public. The Contractor shall [not] coordinate directly with [nearby residents] [local interested authorities][Restoration Advisory Board] in planning and scheduling the [phone] interview[s] as recommended in the USEPA five-year review guidance (USEPA, 1999). *[The USACE will coordinate the time for the interviews.]* *[The point of contact[s] (POC) for the Public [is][are] _____.]* *[The Contractor shall invite representatives of the Public to the RSE site visit [out-brief]. [The USACE manager should discuss the appropriate involvement of the Public with the Installation or Customer. It may be more appropriate for the USACE or the Installation/Customer to handle the coordination. The EPA five-year review process recommends the interviews of the public. If acceptable to the Installation/Customer, the Public representatives can attend in the RSE out-brief meeting. Their participation can, if the relationship with the public is somewhat constructive, make the acceptance by the Public of any recommended changes easier.]*

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7. Task 4 - Site Visit. The contractor shall visit the site to inspect the system, interview personnel, gather operational data that was not otherwise available, make limited measurements to supplement this data (as appropriate based on the review of documents and interviews conducted in task 2 and 3), shall observe the operation of the process equipment, and document observations with [appropriate field notes][RSE checklists][photographs and/or video].

7.1. Estimated Duration and Personnel. The site visit shall be conducted over the course of [1][2][3][_] days, including travel from the contractor's office. The contractor shall provide a team consisting of [1][2][3][_] members including a [hydrogeologist] [chemical engineer] [environmental engineer] [geotechnical engineer] [_____].

7.2. Government Participation. The Government will [not] provide [a] team member[s] to participate in the RSE site visit [and will notify the contractor of the team members within ___ days of contract award]. [The contractor shall coordinate the site visit with the identified Government team members within two weeks of the site visit].

7.3. Introductory Briefing. Upon arriving at the site, [the Contractor shall][a Government team member will] provide an introductory briefing of the site staff, as appropriate, regarding the the RSE process and the nature and sequence of the RSE site visit. The [Contractor shall] [team will] answer any questions raised by the site staff. The Contractor shall supplement any previously conducted interviews with appropriate questions of the site staff at this time or during the out-briefing. The contractor shall obtain any necessary site safety briefing prior to going out on site.

7.4.. Site Tour / Review. The Contractor shall inspect all pertinent components of the remediation system, verify operational conditions and parameters, inspect condition of equipment and plant, note maintenance deficiencies, identify system changes not otherwise documented in the design documents and as-builts, interview operator personnel, identify record-keeping processes, note any other unusual or relevant site conditions or circumstances, in general accordance with, but not limited to, the issues described on the applicable RSE checklists.

7.4.1. Above-Ground Facilities. *[Describe the aboveground facilities to be inspected but do not limit the contractor to only certain subset – allow the contractor the freedom to pursue issues that arise in the document review task or during the site visit itself. If certain facilities are only peripherally involved in the process, say a steam plant on the installation or the DRMO facility, you may want to exclude those from the site visit.]*

7.4.2. Subsurface System [Cap] *[Again, describe the subsurface components or landfill cap(s) that are to also be inspected. Do not limit the contractor as described above, but you may want to restrict the inspection to facilities that are directly related to a specific site (e.g., limit the monitoring well network to only that used in evaluating that specific site when there are other nearby sites.)]*

7.5. Checklist Use and Review. Following the initial site inspection, the team shall reassemble and review the applicable RSE checklists to assure that all issues and components have been evaluated. Observations and questions shall be shared among the team members to develop and identify general issues as appropriate to better refine issues needing further evaluation by specific team members or the entire team in conjunction with the site staff.

7.6. Follow-up Site Tour. If necessary, the team shall revisit specific system components [and discuss issues with site staff] to clarify unresolved issues.

7.7. Out-Briefing. The [Contractor shall][Government representative will] conduct an out- briefing for the site staff of the significant issues (both negative and positive) identified during the site visit. Some preliminary/initial recommendations may be identified, but the Contractor shall clearly state that no recommendation provided at the out briefing should be considered final until the RSE report is issued. The Contractor shall make every effort not to lay blame for any site deficiency and shall exercise professionalism and tact in addressing all issues.

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8. Task 5 - Data Analysis. The contractor shall analyze the data collected as part of Tasks 2, 3, and 4 as described below. The objective of the analyses is to fulfill the goals of the RSE as described in section 1.1 of this scope of work, and shall consider the issues and perform the analyses described in the relevant RSE checklists. Any significant quality problems for prior analytical data should be evaluated in the context of the objectives of the investigation prior to data reduction and analysis is performed. A statistical approach should be implemented if this significantly facilitates the evaluation of the analytical data with respect to the goals of the RSE. Some of the analyses may be performed at the time of the site visit, others may be performed following the site visit.

8.1. Subsurface Performance and Protectiveness Review. The contractor shall review the available information and determine the degree to which the remedy is performing as intended and the level of protection offered to human health and the environment. The review shall include an evaluation of the monitoring data, both physical and chemical as described in the appropriate RSE subsurface performance evaluation checklist [and the EPA five-year review guidance.] [If the remedial action objectives are risk based, a risk assessor shall conduct a brief evaluation of the basis for the risk-based criteria in light of any new toxicological data. The risk assessor shall have a thorough understanding of both EPA and USACE guidance on conducting risk assessments and shall have a minimum of [3] [] years experience in performing risk assessments. *[The scope should include specific direction on the evaluation of the site remedy, such as a ground water pump and treat or soil vapor extraction system.]*

8.2. Regulatory Review. The contractor shall generally evaluate the compliance of the remedy with the applicable regulations (both state and Federal requirement) and shall identify any changes in applicable regulations or standards since the remedy decision document was approved. The intent of this review is not to perform a thorough compliance audit, but rather to identify significant deficiencies that may cause a risk of health impacts or regulatory action and to identify changes in regulation that may allow or force changes in treatment objectives. These changes may result in cost savings (e.g., due to changes in influent concentrations, offgas treatment is no longer needed for an air stripper), or may change the target treatment zone due to a revision in numerical or risk-based clean-up standards.

8.3. Evaluation of Remedial Action Objectives and Exit Strategy. The contractor shall evaluate the remedial action objectives (or equivalent) and verify that such objectives are clearly stated in decision documents, O&M manuals, and/or other documents and are understood by the site staff. The contractor shall evaluate the objectives in light of changes in applicable regulations and standards and understanding of technology limitations to verify that the objectives are reasonable. Furthermore, the contractor shall evaluate if the site staff have developed a clear exit strategy such that the process to site closure is well defined.

8.4. Equipment / Component Performance and Maintenance and Overall Aboveground Treatment System Review. The contractor shall evaluate the performance of each component of the remedy based on the available information and shall determine if any changes in the operation of the component is necessary (including the elimination of the component). The contractor shall also evaluate the adequacy of the maintenance of the component and determine changes in the procedures or frequency of maintenance. In addition, the contractor shall evaluate the overall performance of the above-ground treatment system and identify changes appropriate in the overall approach to the treatment of the waste streams. The review shall generally follow the appropriate RSE checklists. *[Additional guidance on specific pieces of equipment should be provided as necessary on a site-specific basis.]*

8.5. Optimization Evaluation. The contractor shall review the available information and shall identify changes in the operation of existing remedy components/technology or recommend entirely different technologies that would offer significant cost-saving potential. The optimization evaluation shall include limited engineering

analyses and conceptual design necessary to evaluate screening level costs and provide a basis for further follow-on studies not included as a portion of this contract. [The contractor shall evaluate whether any of the recommended changes would trigger the need for an Explanation of Significant Differences (ESD) or require the re-opening of the ROD as per EPA 540-R-98-031, “A Guide to Preparing Superfund Proposed Plans, Records of Decisions, and Remedy Selection Decision Documents.”] *[This is appropriate for CERCLA sites.]*

8.5.1. Alternative Technologies. The contractor shall consider the applicability of alternative subsurface soil/groundwater or waste stream treatment technologies that may allow lower O&M costs or shorter remediation times. The contractor shall develop recommendations as appropriate, in general accordance with the guidance provided in the relevant RSE checklists [and the following customer constraints]. *[If there are specific technologies that the customer or district would like considered, they should be listed here. Specific customer requirements or constraints should also be listed here (e.g., desired remediation timeframe, land use or access issues).]*

8.5.2. Recommended Changes in System Components. The contractor shall identify changes in the types and design of system components to achieve system objectives in a more cost-effective manner. Engineering evaluation shall include development of a conceptual process flow diagram and rough equipment sizing if changes to the process are recommended.

8.5.3. Recommended Changes in Operations and Maintenance. The contractor shall identify changes in the operation and maintenance of existing equipment or components in order to reduce operating costs and prevent unnecessary equipment repair and/or replacement costs. Limited engineering calculations shall be performed as necessary to verify the adequacy (for meeting objectives) of any recommended changes in operation.

8.5.4. Recommended Changes to Monitoring Program. The contractor shall identify changes in the monitoring program for both subsurface performance and waste-stream treatment processes. Both physical and chemical monitoring shall be considered. For subsurface performance monitoring, the spatial monitoring network (e.g., monitoring well locations) and monitoring frequency shall be evaluated for potential modification. Detailed quantitative analyses [(e.g., Cost Effective Sampling {CES} sampling frequency analysis, geostatistical analyses of monitoring networks)] are [not] required. *[For most RSEs, such detailed evaluations are outside the scope; however, if the data are available in a form that facilitates such quantitative analysis, and it is clear that there is significant redundancy in the monitoring program, such an analysis may be worthwhile.]* For waste-stream treatment process monitoring, the contractor shall evaluate the sample tap/port locations and sample frequency for potential modification. The contractor shall also evaluate the chemical analytical program and recommend changes (e.g., the analytical methodology, associated QA/QC and data validation requirements, and analytes of concern). These evaluations shall be performed in accordance with the Air Force Long-Term Monitoring Optimization Guidance and the appropriate RSE checklist. Although, it is desirable to reduce monitoring costs through this evaluation, the contractor shall also recommend additions to the monitoring program where necessary to properly evaluate the performance and protectiveness of the remediation system.

8.5.5. Changes to Contract Approach or Provisions. The contractor shall make recommendations to the contracting approach for O&M at the site that would reduce O&M costs. This may include, for example, recommending changes to the system of measurement and payment (e.g., lump sum vs. cost plus, incentives, performance-based), type of operations contractor (e.g., small specialized operator vs. engineering consultant), approach to contracting for repairs (e.g., hiring a well rehabilitation contractor directly).

8.5.6. Recommended Studies Outside the Scope of the RSE. The contractor shall recommend other studies outside the scope of the RSE that may result in or support decreased cost and/or increased performance and protectiveness. These may include, for example, a re-evaluation of the risk posed by the site, bench-scale or pilot studies of a different process or technology, ground water modeling, or detailed engineering design.

8.6. Cost Analyses. The contractor shall develop screening level costs for the recommended changes. Any cost estimate shall be developed using the [MCACES and HTRW Work Breakdown Structure to the third level] [RACER] [_____]. The contractor shall [not] contact vendors for quotes on equipment, supplies, and services, as required. [The contractor shall not divulge the site name to the vendors contacted in the process of getting quotes.] The cost analysis shall estimate the following.

8.6.1. Capital Costs for Changes

8.6.2. Projected Changes in O&M Costs

8.6.3. Projected Savings and Time Period

[8.7. Limited Design and Studies as Beyond Typical RSE.] *[The customer or the district may wish to include limited design, modeling or risk assessment beyond the normal RSE procedures. Detailed requirements should be included here, if appropriate. This may also be a contract option.]*

[8.7.1. Preliminary Design]

[8.7.2. Numerical Modeling]

[8.7.3. Risk Assessment]

[8.7.4. Sampling and Analyses]

[8.7.5. Other Studies] *[These may include a more detailed evaluation of the monitoring program, treatability studies, etc.]*

9. Report. The contractor shall prepare a report that summarizes the RSE and shall generally follow the format provided in the General RSE checklist and the Sample RSE report (available at <http://www.environmental.usace.army.mil/library/guide/rsechk/rsechk.html>). [The report shall also document the analyses performed as required in section 8.g.] *[Additional requirements for reporting ground water modeling, risk assessment, or other studies must be provided. Refer to EPA guidance and ASTM standards on modeling, EM 200-1-4 and the EPA Risk Assessment Guidance, as appropriate. Specific requirements for documentation of design are provided in Engineer Regulations ER 1110-345-700 Design Analysis, Drawings, and Specifications as supplemented by ER 1110-1-263 Chemical Data Quality Management for HTRW Remedial Activities and ER 385-1-92 Safety and Occupational Health Document Requirements for HTRW and Ordnance and Explosive Waste Activities.]* The report shall be concise, clearly written, free from typographical and grammatical errors, and less than [15] [25] [___] pages in length [excluding appendices]. The report shall conform to the Federal Style Manual. All figures and drawings shall be drafted [or neatly sketched] and provided on [8.5 X 11 inch] [and/or] [11 X 17 inch] [_____] inch sheets. The contractor shall submit photos or videos taken at the site as appropriate to document the findings. Photos or video tapes shall be labelled with the date, site name, and brief description of the subject. The report shall be provided in [both] [hard copy] [and] [electronic] format. [Electronic submissions shall be in _____ word processor format, and all drawings and graphics shall be in _____ graphics format, unless otherwise authorized by the COR.] *[Recommend that only a draft and final report be required to reduce costs.]*

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9.1. Draft Report. The contractor shall prepare a draft report for review by the Government, [the site staff,] [the regulatory agencies,] [_____]. The draft report shall be provided [in hard copy] [and] [electronically] to the COR.

9.2. Comment Responses. Comments will be provided to the contractor [in hard copy] [electronically]. The contractor shall prepare comment responses [including a restatement of the original comment] that clearly state the actions taken to incorporate the comment [or show the changes in a redline and strikeout version of the revised report.] The contractor may [not] contact the reviewers directly. Unresolved technical issues shall be coordinated with the POC.

9.3. Final Report. The contractor shall provide a final report incorporating the comments on the draft [as discussed with the POC]. The final report shall be provided [in hard copy] [and] [electronically] to the COR. *[Recommend that the final report be provided electronically such that it can be revised to the satisfaction of the district or the customer.]*

9.4. Distribution. The contractor shall provide copies of the draft report, comment responses, and final report as shown in the table below:

Address	No. of Copies		
	Draft Report	Comment Response	Final Report

Commander	XX	XX	XX <i>[insert no. of copies]</i>
U.S. Army Corps of Engineers			
ATTN: CE____-____-____ (_____)			
Street Address			
City, State zip			
Or e-mail address			
Other (one each)	XX	XX	XX
<i>[addresses to be determined]</i>			

10. Schedule. The project schedule is as follows (all days are calendar days):

Notice to Proceed on Written Order is	Day 1
[Data Collection Visit]	Day ----
[Interviews]	Day ----
Site Visit	Day ----
Draft Report	Day ---- <i>[recommend 30 days after site visit]</i>
Final Report	Day ----

[The work should normally be completed within 60-90 days of Notice to Proceed.]

11. Additional Travel. Payment for the Contractor to attend additional conferences, when so requested in writing by the COR, will be made at the rate per hour for the discipline(s) involved plus travel expenses computed in accordance with the Government Joint Travel Regulations in effect at the time travel is performed plus actual cost of transportation.

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