

Statement of Work (SOW) Template
for a Small Arms Range
Remedial Investigation and Feasibility Study (RI/FS)

Department of the Navy

NAVFAC [fill in the appropriate FEC]

Statement of Work (SOW)

Contract Number:

The statement of work shall be as outlined below and as described elsewhere in the basic contract number [insert].

SMALL ARMS RANGE REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

[Insert Installation/Site Name]

RPM Note: Please refer to the Remedial Project Manager (RPM) Notes provided throughout this template and delete all notes prior to finalizing the SOW. As used in this document, the term MEC includes Discarded Military Munitions (DMM), Unexploded Ordnance (UXO), and Munitions Constituents (MC) (e.g., TNT, RDX) in high enough concentrations to pose an explosive hazard. Munitions Constituents (MC) are defined as materials originating from UXO, DMM or other military munitions, including explosive and non-explosive materials, and emission, degradation or breakdown elements of such ordnance or munitions. Include the specific definitions from the introduction if needed.

MCs below an explosive hazard are mixtures of explosive compounds and soils in concentrations less than 10% (by weight) for secondary explosives and less than 2% for primary explosives.

Small arms ammunition is ammunition, without projectiles that contain explosives (other than tracers), that is .50 caliber or smaller, or for shotguns.

A small arms range is a range used exclusively for expenditure of small arms ammunition.

Text highlighted in yellow indicates where you need to provide information specific to your project.

You will want to consider if you need a separate SOW for the planning phase prior to scoping and awarding a contract for the field work. It is important to ensure that your stakeholders are in agreement with the planned approach.

Reference information is available at the Munitions Response Workgroup web portal at https://portal.navy.mil/portal/page/portal/NAVFAC/NAVFAC_WW_PP/NAVFAC_NF_ESC_PP/ENVIRONMENTAL/ERB/MRP

As a reminder, the RPM must update the Munitions Response Site Prioritization Protocol (MRSPP) priority in NORM if any of the following circumstances are met:

- ***Upon completion of a response action that changes an MRS's conditions in a manner that could affect the evaluation under this Protocol;***

- **To update or validate a previous evaluation of an MRS when new information is available;**
- **To update or validate the priority assigned (to an MRS) where that priority has been previously assigned based on evaluation of only one or two of the three hazard evaluation modules;**
- **Upon further delineation and characterization of an MRA into more than a single MRS; or**
- **To categorize any MRS previously classified as “evaluation pending.”**

The Protocol is only required to be reapplied once sufficient new data are available. If no new data are available at the time of annual review, the Protocol need not be reapplied. See the Munitions Response Site Prioritization Primer for more details.

1.0 OBJECTIVE

The objective for this task order is to perform a Remedial Investigation (RI) [and Feasibility Study] (FS) at the [insert the site specific identifier] at [insert installation, City, State] small arms range in order to address the past release of Munitions Constituents (MC).

The purpose of this RI/FS is to determine the nature and extent of the threat presented by MC contamination at [Insert Site] and, if sufficient need is documented by site sampling, perform a risk assessment, and evaluate proposed MC remedies. Integrating the development of the RI and FS is important to ensure that data obtained in the RI is appropriate to evaluate likely remedial alternatives during the FS. The contractor shall determine the nature and extent of the release of MC at the site, provide data for the risk assessments, perform the risk assessments, and collect sufficient data to develop and evaluate potential remedial alternatives as necessary and to recommend a preferred alternative for those areas of concern (AOC) within the MRS that have been determined to present an unacceptable risk.

This action will be performed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Sections 104 and 121; Executive Order 12580; and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). [RPM to identify other regulatory drivers for this project.]

2.0 SCOPE

The scope of this Task Order is to conduct all work required to complete the final RI/FS Report for the site with Navy and regulatory concurrence. Details of this scope are further defined in Section 4. All work must be performed following applicable and appropriate Department of Defense (DOD) guidance and policy for Munitions Response Program (MRP) response actions and consider all site documentation and reports to date. The RI for this site shall consist of field investigations, including [MC sampling, etc] to characterize the nature and extent of MC (e.g., compound, affected medium, level of contamination, extent of area affected, etc.) sufficient to assess the extent to which the MC poses a risk to human health and the environment and to support the analysis and design of potential response actions if the site poses an unacceptable human health or ecological risk. The RI will provide a basis for decisions on further response actions or no further action (NFA).

RPM Note: The risk assessment from exposure to munitions constituents should follow the Navy’s tiered approach for both the Human Health Risk Assessment and the Ecological Risk Assessment. The relevant Navy Policies are: “Conducting Human Health

Risk Assessments Under the Environmental Restoration Program” (Ser N453E/10595168, 12 Feb. 2001); and “Navy Policy for Conducting Ecological Risk Assessments” (Ser N453E/9U595355, 05 Apr. 1999). Navy guidance for conducting a human health risk assessment is provided in “U.S. Navy Human Health Risk Assessment Guidance”, December 2008. Navy guidance for conducting an ecological risk assessment is provided online at <http://web.ead.anl.gov/ecorisk/>

The Work Plan should allow for the potential need for conducting the risk assessments prior to completing the RI report if the sample data suggest that risk criteria will not be achievable. This will allow for the results of the risk assessments to assist in the formulation of the possible remedial alternatives, as necessary. RPMs should consider the option of utilizing an interim removal action to address known source areas, followed by collection of updated data prior to proceeding with the risk assessment calculations. This could save significant time and cost if the site is expected to require a removal action (see the RI flow chart at the end of this document for the suggested approach).

The RI shall use the existing site information to accomplish the following:

- Develop a Work Plan for collecting necessary field data and other project plans;
 - Establish DQOs for your site in coordination with stakeholders (see U.S.E.P.A. Guidance on Systematic Planning Using the DQO Process (EPA QA/G-4, 2006),
 - Based on established DQOs for the project, select the appropriate sampling and analysis approach for MC, and
 - Identify the appropriate MC investigation depth based on data from the site and the reasonably anticipated future land uses.

The RI contractor shall then:

- Conduct the field work and assess the data collected to characterize the site;
 - Perform risk assessments (Human Health Risk Assessment, Baseline Ecological Risk Assessment) considering MC findings, access, land uses, and regulatory input which will provide a basis for decisions on further response actions or no further action (NFA), and
 - Update the Conceptual Site Model (CSM) based on the site information and form the basis for the development of Remedial Action (RA) Objectives.

The overall objectives of the FS are to: develop and evaluate potential remedies that permanently and significantly reduce the threat to public health, welfare, and the environment using the nine criteria established by CERCLA for remedy selection [\[40 CFR 300.430\(e\)\(9\)\(iii\)\]](#). These criteria are:

- Protection of Human Health and the Environment;
- Compliance with ARARs;
- Long Term Effectiveness and Permanence;
- Reduction of Toxicity;
- Short Term Effectiveness;
- Implementability;
- Cost;
- State Acceptance; and
- Community Acceptance

The FS shall use the data generated from the RI, with input from the risk assessments, to accomplish the following:

- Develop and Screen Remediation Alternatives for Effectiveness, Implementability and Cost;
 - Identify the appropriate remedy alternatives to consider (e.g. excavation and sifting, land use controls, etc.),
 - Identify the appropriate removal depth based on data from the site, the risk assessments and the future land use,
 - Assemble the remedies into alternatives and screen the alternatives as necessary, to reduce the overall number of alternatives to be forwarded for more detailed analysis, and
 - Identify Applicable or Relevant and Appropriate Requirements (ARARs).
- Conduct a detailed analysis of remedial alternatives;
 - Refine the alternatives further, as necessary,
 - Analyze the alternatives against the nine NCP criteria, and risk assessments, and
 - Compare the alternatives against each other.

Based on the alternative analysis performed in the FS, the Navy, with regulatory coordination, will select a proposed remedy that will be described in a Proposed Plan for public review and comment. Comments and input obtained on the Proposed Plan will be addressed as necessary during the development of a Record of Decision (ROD) or other Decision Document (DD) that will define response requirements for the MRS or AOCs within the site.

RPM Notes: The details for scoping a Proposed Plan and Record of Decision are not included in this scope, but the RPM can choose to add it if it is appropriate for your site. The EPA has proposed a presumptive remedy for removing lead from small arms ranges which originated from the small arms ammunition projectiles. Consult with your regulators for details. See also ITRC's Characterization and Remediation of Soils at Closed Small Arms Firing Ranges, January 2003.

Depending on the specific need at the site, a Community Relations Plan (CRP) may also be developed as part of this SOW. If not developed under this SOW, a CRP should be provided to support this and other phases of the MRP at the site. The CRP will:

- Provide the public an opportunity to express comments on and provide input to technical decisions;
- Inform the public of planned and ongoing actions; and
- Help identify and resolve conflicts.

3.0 SITE BACKGROUND

3.1 Location

[Describe the location of the site and provide a brief description of the terrain and vegetation, any existing buildings or infrastructure, photo(s), and any other information to help describe the general location and attributes for the study area. Provide references (if available) to reports or other information that would be relevant to the level of effort required to complete tasks, such as site inspection surveys and removal actions, that are assumed to be part of the RI.]

3.2 History

[Provide a brief history of the site and the reasons, known or suspected, for the potential presence of MC. Add subsections if there are specific areas of known MC and describe the types of small arms ammunition if known. Include information on the source of MC at each site (disposal, range, manufacturing, etc). Depending on the extent of information available concerning the site, it may be appropriate to reference existing reports or documents rather than providing a complete summary in the SOW].

RPM Note: *The RPM should be clear in these sections whether the site undergoing the RI/FS is an MRA, MRS or multiple MRSs. This general breakdown should have resulted from the PA/SI phase and the contractor will need to understand the limits of the study. The Navy may only be interested in remediating a single MRS within an MRA that contains multiple sites and this point should be clear in this SOW.*

It is important to state the pertinent small arms ammunition use history including the types of ammunition, types of operations (e.g., skeet range, pistol range, firing points, impact berm areas, etc.), past findings, Archive Search Reports (ASR) results, past response actions, as well as any other pertinent information on small arms uses at the site from the PA/SI reports. RPMs are encouraged to reference pertinent reports or documents that detail the history of the site and the degree of information available concerning MC incidence at the site. For small arms ranges, it is important to provide any known information on firing lines and target locations as well as the types of ammunition used at the site. The penetration depth and the range maintenance activities will be a key factor in developing your sampling and removal criteria. For non-range sites, you should consider any other information that may determine the maximum depth that MC is anticipated to be found. This can be based on geology, land filling activities, historic documents or various other sources. While this is not always available, it can be very useful in focusing the investigation.

3.3 Munitions and Explosives of Concern (MEC) and/or Material Potentially Presenting an Explosive Hazard (MPPEH) Other Than Small Arms Ammunition

The site is not expected to contain MEC or MPPEH, other than expended or unexpended small arms ammunition. However, if suspect items are encountered during any phase of site activities, the contractor shall immediately withdraw from the work area, secure the site and contact the Navy RPM who will, in turn, request an emergency response from the cognizant Explosive Ordnance Disposal (EOD) detachment. The contractor shall maintain site security until written direction is provided by the Navy regarding the procedure to be followed for performing further RI/FS work at the site. The RPM will coordinate with NOSSA/MARCORSYSCOM.

RPM Note: *It is assumed that neither MEC nor MPPEH, other than expended or unexpended small arms ammunition, will be encountered at small arms ranges and that this disclaimer is appropriate. The level of planning and protective measures required for projects that may result in encounters with MEC or MPPEH is significantly greater than projects without MEC or MPPEH. Per NOSSAINST 8020.15 (series), an ESS may not be required for operations taking place in areas known or suspected to contain MEC or MPPEH when the preponderance of evidence indicates the likelihood of encountering the MEC or MPPEH is low. These operations include ground disturbing activities on former*

ranges used exclusively for testing or training with small arms ammunition. RPMs are required to obtain a NOSSA (N53) or MARCORSYSCOM determination that an ESS is not required. The RPM shall submit the appropriate enclosure from NOSSAINST 8020.15 (series), "Request for an Explosives Safety Submission Determination".

MEC and MPPEH represent a safety hazard and may constitute an imminent and substantial endangerment to personnel and the local population due to its explosive potential. All activities involving work in areas potentially containing MEC or MPPEH hazards require prior approval from the Naval Ordnance Safety and Security Activity (NOSSA) or MARCORSYSCOM and must be performed in accordance with OPNAV 8020.15(series) (MCO 8020.13(series) for Marine Corps sites), NAVSEA Operations Pamphlet (OP) 5, NOSSAINST 8020.15 (Series), and DOD 6055.9-Std., and all other DoN and DOD requirements regarding personnel, equipment, and procedures.

3.4 Small Arms Ammunition

Due to the nature of a small arms range, expended or unexpended small arms ammunition are expected to be encountered during field work. Consequently, processes must be established and personnel must be trained and qualified prior to on-site work to ensure that recovered small arms ammunition are properly managed. If the site is located on an active facility, the contractor must document the description and location of the small arms ammunition and notify the responsible Explosives Safety officer and the project manager. If the site is not located on an active facility, the contractor must document the description and location, notify the project manager. Regardless of the location, small arms ammunition must be managed in accordance with NAVSEA OP 5, paragraph 13-15, and applicable environmental regulations.

RPM Note: The RPM should be aware that qualifications and training required for the site must be tailored to the site conditions. For example, a small arms site that also has had a release of chemicals would require that workers meet the 40 hr OSHA training requirements. It is not expected that a ranged used solely for small arms ammunition would have workers who are trained per DDESB TP-18 (which outlines the minimum requirements for UXO Technicians and Personnel).

The requirements for managing expended small arms ammunition can be found in NAVSEA OP-5, paragraph 13-15. Expended small arms ammunition that have been documented as safe (i.e. inspected, certified, and verified as safe) are considered MDAS as long as the chain of custody is maintained. In general, treatment of unexpended small arms ammunition will involve a furnace, an incinerator, or a deformer and may be regulated under RCRA. Although munitions responses to unexpended small arms ammunition do not require an ESS, these items are considered to pose an explosive hazard (considered MDEH) and must be managed in accordance with OP 5 and applicable environmental regulations.

3.5 Chemical Warfare Material (CWM)

The site is not suspected to contain Chemical Warfare Materiel (CWM). However, if suspect CWM is encountered during any phase of site activities, the contractor shall immediately withdraw upwind from the work area, secure the site and contact the Navy RPM. The contractor

shall maintain site security until written direction is provided by the Navy regarding the procedure to be followed for performing further RI/FS work at the site. The RPM will coordinate with NOSSA/MARCORSYSCOM.

RPM Note: It is assumed the CWM is not expected to be encountered at most MRP sites and that this disclaimer is appropriate. The level of planning and protective measures required for projects that may result in encounters with CWM is significantly greater than projects without CWM.

3.6 Sites with Potential MC

3.6.1 Site 1

[Site 1, Former (Skeet, Pistol, Rifle, Small Arms, etc.) Range, comprises XYZ acres and is located in the (where) portion of the MRA. It was used exclusively for (small arms weapons training, recreational skeet shooting, etc.) for X years. Describe the circumstances surrounding the operations in sufficient detail so that the bidders will understand the circumstances of the site. According to the PA/SI, historical records review, etc., the following MC are associated with this site:

- Small arms ammunition projectiles (antimony, arsenic, copper, iron, lead, tin, and zinc);
- Clay targets (PAHs); and
- Propellants (Nitroglycerin, DNT).

[Provide a description of the property, for example: The property is (hilly, relatively flat, mountainous, etc.) with (dense, sparse, etc.) vegetation. A creek runs through the property from SE to NW and the land on either side of the creek for approximately 100 feet is very wet and cannot be traversed by vehicle. etc. Include a description of any manmade infrastructure that is on the property.]

RPM Note: For rifle and pistol ranges, most training is done with fixed or stationary targets at known distances, resulting in the formation of “bullet pockets” on the face of the berm. The high-impact energy of these high-speed rounds with the rounds accumulated in the bullet pockets results in significant fragmentation and ricochet. To mitigate ricochet, standard range maintenance practices include “refacing” and/or turning the berm soil over to bury the projectiles below the impact depths of incoming rounds. As a result, particulate lead can be found at depths below traditional impact depths; and the particles range from whole, relatively intact projectiles to microscopic metal particles.

Shotgun ranges (skeet, trap, and sporting clays), on the other hand, typically involve widely dispersed lead particles that fall to the ground with little impact energy. Remediation of these ranges involves large soil volumes with relatively low particulate lead concentrations. However, based on the age of the range and soil chemistry, lead shot can corrode into a wide range of various particle sizes.

The disk-like, flying targets (called “clay pigeons”) used at shotgun ranges contain PAHs. However, Baer (1995) found that the targets did not exhibit the characteristics of toxicity as determined by an USEPA toxicity test even though they contained high levels

of PAHs. The state of Connecticut accepted these findings and treated the targets at the site as solid rather than hazardous wastes.

The Army Corps of Engineers ERDC/CRREL has recently released a report on “Propellant Residues Deposition from Small Arms Munitions” (TR-07-17).

3.6.2 Site 2

[Same information for each of multiple sites, if multiple sites are part of the RI]

RPM Note: The purpose for the site descriptions is to provide the contractor with as clear a picture of the property as possible. A description of the MC activities is essential so that they can evaluate the best possible investigation techniques to recommend. A list of the types of MC is necessary to determine which analytical methods will be used to detect the MC. The description of the property and infrastructure is necessary to evaluate what sort of platform (e.g., hand auger, geoprobe rig, hollow stem auger, backhoe, etc) to use to collect the samples and which type of positioning (e.g., GPS, fiducial, other) may be most effective. It is also important for the RPM to determine if the site will have to be cleared of vegetation or debris prior to field work.

The RPM is encouraged to provide references to documents and information that may provide a more detailed account of site conditions and history than can be provided in the site description in the SOW. In addition, a scoping meeting should be included with the contractor prior to their development of a proposal to allow the contractor to obtain all necessary data for development of the proposal. In the event that data necessary to accurately estimate the level of effort to perform the RI is not available (e.g., number of anomalies per acre in the site) the RPM and contractor should agree to the assumptions that will be used in development of the proposal.

4.0 RI DOCUMENTS

RPM Note: For sections 4.0 and 5.0 we have included below a list of the typical types of investigation/analysis an RPM may do at a MRP site during the RI/FS phase. The RPM should adapt this SOW from the parts outlined below and apply them to your specific site as needed. Each component is described in greater detail at the end of this SOW and should be cut and pasted in as needed. The documentation required for each component is highlighted below and described for each at the end of this SOW template. The hyperlinks to each section are below, just press the ctrl key and click to go to the relevant section.

The primary goals of the RI are to determine the nature and extent of contamination and to use this data to develop a baseline exposure assessment for the site. The exposure assessment considers potential threats to human health and the environment from site contaminants. The baseline exposure assessment is used to determine if an unacceptable health/ecological risk exists at the site. If an unacceptable risk exposure is determined to exist, the FS evaluates the array of remediation alternatives that will be considered to address this situation and select the preferred alternative.

In developing the plans for the RI/FS, the RPM should follow guidance provided by U.S. Environmental Protection Agency, 2006a, Guidance on Systematic Planning Using the Data Quality Objectives (DQO) Process (EPA QA/G-4). Use of this guidance will focus data collection activities included in the RI/FS to ensure that only data needed to support decision making an alternative analysis is collected and prevent needless expense and time collecting data that does not contribute to RI/FS objective. The RPM also is required to develop a UFP-SAP. The UFP QAPP Manual Guidance is implemented by NAVFAC through completion of thirty seven separate worksheets that address specific elements of the UFP QAPP guidance. Each of the worksheets references the applicable section of the UFP QAPP Manual it is intended to address. The Navy UFP-SAP template for each of these worksheets is included as a reference. The Navy UFP-SAP team has developed "Greentext" for the required UFP-SAP which provides suggestions and examples on how to populate the UFP-SAP worksheets for a MC sampling project. These worksheets are NAVFAC specific and provide a graded approach to developing the sampling and analysis plan.

The RPM should coordinate with stakeholders prior to developing this SOW to outline the site requirements and DQOs, which will help determine the most appropriate components to include for your site. In many cases, the process of determining the DQOs and defining the field data necessary to meet these objectives will require an extensive planning effort to ensure that input from regulatory agencies and stakeholders has been appropriately considered. This is particularly true for complex projects that are managed under Interagency Agreements with Federal and State regulatory agencies. At such sites, draft RI/FS work plans are commonly a primary deliverable requiring State and Federal regulatory agency approval prior to initiation of any RI/FS field work.

In cases where an extensive planning effort is required to develop the RI/FS work plans and define the DQOs and field work and data collection requirements for the RI and subsequent FS, the RPM should consider scoping the planning effort for development RI/FS work plans separately from execution of the work plans. Separate scoping of the work plan development phase of the project will allow the RPM and contractor to better define the field work that will be required to complete tasks identified in work plans that have been approved by regulatory agencies.

4.1 RI Work Plan

The contractor shall prepare and submit a Draft, Draft Final and Final RI Work Plan, with the required appendices, which describe how to implement the requirements and information developed during the planning and scoping of this RI Work Plan. The RI Work Plan will define project objectives, decision making criteria, and associated data needs to reach project closeout and describe Data Quality Objectives (DQOs). The basic RI Work Plan will describe the general methodology for performing the site MC work, including at a minimum:

- Site preparation, including vegetation removal and removal of surface metallic debris (if required);
- MC sampling;
- Geographical Information Systems (GIS) and data management; and
- Investigation-derived waste (IDW) management.

4.1.1 Site Health & Safety Plan (HASP)

The contractor will prepare and submit a Site Health & Safety Plan (HASP). The HASP will contain an Activity Hazard Analysis (AHA) for each site-specific task to be conducted. The HASP will be appended to the Accident Prevention Plan (APP) that was prepared for the basic contract.

4.1.2 Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP)

The contractor will prepare a Draft and Final SAP/QAPP in accordance with the Guidance for Quality Assurance Project Plans, EPA QA/G-5, December 2002 and the Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP), which was signed by EPA and DOD in March 2005 and the Navy UFP-SAP Template. The SAP will comprise a Field Sampling Plan (FSP) and a Quality Assurance Project Plan (QAPP), at a minimum. The SAP will be submitted as an Appendix to the RI Work Plan.

The contractor shall propose a methodology for selecting sampling locations, in coordination with the RPM and the stakeholders to characterize and evaluate exposures to MC at the site(s). Samples shall be analyzed in accordance with the most current approved methods consistent with the SAP/QAPP.

RPM Note: The following references for MC Sampling at a small arms range may be useful to the RPM.

a. Characterization and Remediation of Soils at Closed Small Arms Firing Ranges, ITRC, January 2003

b. Propellant Residues Deposition from Small Arms Munitions, ERDC/CRREL TR-07-17, September 2007

c. Technical Protocol for Determining the Remedial Requirements for Soils at Small-Arms Firing Ranges, AFCEE, August 2000

d. NAVFAC Uniform Federal Policy –Sampling and Analysis Plan Template, (See your FEC QA POC for the latest version)

e. Munitions Constituent (MC) Sampling Technical Update, USACE Military Munitions Center of Expertise, March 2005

f. USEPA SW 846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Method 8330B Nitroaromatics, Nitramines and Nitrate Esters by High Performance Liquid Chromatography and Method 8321A Solvent Extractable Nonvolatile Compounds by High Performance Liquid Chromatography/Thermospray/Mass Spectrometry (HPLC/TS/MS) or Ultraviolet (UV) Detection

g. DoD EDQW Guide for Implementing EPA SW-846 Method 8330B

h. Environmental Management at Operating Outdoor Small Arms Firing Ranges, ITRC, February 2005.

i. Implementation of Incremental Sampling (IS) of Soil for the Military Munitions Response Program, USACE Interim Guidance 09-02, July 20, 2009.

Sample locations should be marked with a stake or other means, with identifying markings, tags, or by other location ID methods for future reference. Locations on maintained grounds should be marked in a manner that does not interfere with grounds maintenance (mowing).

The analytical laboratory should be identified in the proposal and must be identified in the SAP/QAPP and hold all applicable state certifications to perform the analytical methods required. Laboratories must also meet Navy IR QA Program requirements presented in the most current version of the Navy Installation Chemical Data Quality Manual, SP-02056-ENV.

The contractor shall determine the position of all sample locations using Global Positioning System (GPS) or other location method that will achieve a horizontal accuracy of [insert number] feet. The contractor shall prepare a drawing and spreadsheet of the sample location information (name, coordinates) and submit it as part of the MC Data Package with the RI Report. The same information will also be submitted to NIRIS using the NEDD and automated data checker. QA/QC samples of sufficient matrix medium type and quantity must be collected.

The SAP/QAPP will outline the contractor's Quality Control and Quality Assurance measures. The duplicate QA and QC samples will be analyzed for the same parameters as the field samples. All samples will be submitted to a Navy-accredited laboratory. All procedures for samples collected and analyzed for MC shall be addressed and identified in the SAP/QAPP.

RPM Note: During the initial phase of the site characterization, field screening may be an effective way to define the boundaries of the area affected by the chemical constituents of concern, identify "hot spots" or source areas, and focus the scope of the investigation and sampling plan. Portable multi-element x-ray fluorescence (XRF) analysis, in particular, may be used to approximate lead, arsenic, and other metallic elements in situ to establish contamination profiles and identify locations for collecting confirmatory samples for laboratory analysis. Since contamination patterns tend to be heterogeneous, the large number of data points gathered with in situ field screening can be a time- and cost-saving means of delineating contamination patterns.

Depending on the data quality objectives, an XRF instrument may be used to screen samples for subsequent laboratory analysis or may be used with USEPA Method 6200 to achieve the necessary precision and accuracy to quantify metal concentrations for use in risk characterization and remedial decision making.

Standard USEPA SW-846 Method 3051 is used for digestion of samples for total metals analysis. The digestates can then be analyzed by flame AA or by ICP (SW-846 Standard Method 6010).

For a more thorough discussion of Soil Sampling, Sample Collection, Preparation of Soil Samples for Analysis, and Soil Sample Analysis, see ITRC's Characterization and Remediation of Soils at Closed Small Arms Firing Ranges.

The EPA's SW 846 Method 8330B (November 2006 update to the original 8330) includes field sampling techniques, as well as analytical procedures, for munitions constituents sampling on ranges where energetic compounds are used. It should be noted that because EPA Method 8330B is so new, only a few commercial laboratories are setup to use the method at this point in time, particularly the grinding and sample preparation processes, which is potentially problematic for metals. Also, Method 8330B uses a UV detector, which is not definitive, so a confirmatory method (Ic/ms is an option in 8330B or 8321) could also be used on a subset of the samples to positively identify the constituents present. EPA Method 8321 uses a mass spectrometer to positively identify the compounds present.

RPMs should review the Energetics Constituents Sampling Tool on the Navy's MR Portal, and the DoD EDQW Guide for Implementing EPA SW-846 Method 8330B if they are sampling for energetic compounds.

RPMs will need to choose which analytical and field sampling method to use based on site-specific DQOs. This will entail having to determine how to cost effectively manage the sampling and analysis costs.

4.1.3 Other Relevant Planning Documents

The contractor shall prepare the following additional planning documents, based on knowledge of site conditions provided by the PA/SI and the site-specific RI requirements:

- [insert applicable documents (e.g., Environmental Protection Plan, Erosion Control, Stormwater Management Plan, etc.)]

5.0 RI FIELD ACTIVITIES

5.1 Site Preparation

The contractor shall perform necessary site preparation to adequately support the field sampling methodology outlined in this SOW. [RPM to outline the type and extent of site preparation requirements and/or restrictions based on your site]. Procedures and equipment requirements shall be approved by the RPM prior to execution.

RPM Note: Site preparation for MC sampling will typically be minimal. Site preparation at an MRS generally consists of vegetation clearance and surface removal of debris from the areas that will undergo survey and investigation. It may also include a surface sweep for MEC to ensure safety. The RPM should consider the type of vegetation that needs to be cleared, the regrowth rate, the cost impacts of site preparation, and natural and cultural resource issues (e.g. endangered species or habitat for endangered species).

5.2 Munitions Constituents Sampling and Analysis Activities

The contractor shall propose a plan to collect samples and identify the depth of samples, proposed analysis, and measures to ensure the samples are collected safely. For estimating and planning purposes, the contractor should expect to collect a total of [insert number] samples [including quality control (QC) and quality assurance (QA) samples]. The laboratories shall provide analytical results within 30 days of sample receipt. In accordance with Navy IR QA Program requirements presented in the most current version of the Navy Installation Chemical Data Quality Manual, SP-02056-ENV, the contractor shall be responsible for quality control planning and implementation, performing data validation, and for submitting the appropriate NIRIS electronic data deliverable (NEDDs) via the NIRIS automated data checker.

RPM Note: MC sampling is an area that will be critical to have stakeholder acceptance. Typically SI sampling will have been done to determine the site boundaries and explore the nature and extent of MC contamination. Ideally any sampling at this point should be to augment the work begun during the SI, and be focused on filling any data gaps and addressing any additional sampling issues with the stakeholders in order to reach a level

of certainty regarding the nature and extent of MC contamination at the site. The RPM will need to add language to reflect whether the sampling activity is to augment SI data or whether it is to collect original data from the site. The RPM should add information and references for any past data collected. If the SI did not conduct any sampling, be sure to focus the RI sampling on both defining the site limits and assessing risks from MC.

The need for MC sampling is based on a site specific determination. Past small arms related uses at the site should be considered in developing the SAP. For example, sampling approaches for former rifle ranges will differ from the approach used to assess skeet ranges. Field sampling and field testing techniques, as opposed to wet chemistry analysis by an off site lab, may be appropriate for some sites.

5.3 Investigation-Derived Waste

IDW management shall ensure protection of human health and the environment and be in compliance with ARARs. US EPA/state policy shall be incorporated into the IDW Management Plan developed for the RI Workplan.

RPM Note: US EPA's Guide to Management of Investigation-Derived Wastes (OSWER 9345.3-03FS, Jan. 1992) presents an overview of possible IDW management options, discusses the protectiveness requirements and ARARs associated with these options, and outlines general objectives established for IDW management under Superfund.

6.0 RI/FS REPORTS and CRP

The RI/FS Report shall document the findings of the data collection efforts and field investigation, including relevant data collected by others. The Government reserves the right to collect relevant site data separately or concurrent with this investigation for use in the final RI report. The RI/FS report shall be submitted in preliminary/internal draft for Navy review, draft for full regulatory review, and final after comments are addressed. The contractor will develop a range of MC management alternatives that will remediate or control any MC remaining at the site, as deemed necessary in the RI, and the risk assessments to provide adequate protection of human health and the environment. The potential alternatives should encompass, as appropriate, a range of alternatives (e.g. Dig and Haul, Soil Washing/Particle Separation, Soil Stabilization, Chemical Extraction, Asphalt Emulsion Batching-Encapsulation, and Phytoextraction and Stabilization Approaches) in which MC removal is used to reduce the toxicity, mobility, or volume of MC but vary in the degree to which long-term management of residual/remaining MC is required. One or more alternatives involving land use controls and a no-action alternative should also be included.

The potential technologies and process options should be combined into location-specific or sitewide alternatives. The contractor will meet with the Navy to discuss which alternatives will be evaluated in the detailed analysis and to facilitate the identification of action-specific ARARs. The contractor will conduct a detailed analysis of alternatives which will consist of an individual analysis of each alternative against a set of the CERCLA nine evaluation criteria and a comparative analysis of all options against the evaluation criteria with respect to one another. The individual analysis should include: (1) a technical description of each alternative that outlines the MC management strategy involved and identifies the key ARARs associated with each alternative; and (2) a discussion that profiles the performance of that alternative with

respect to each of the evaluation criteria. A table summarizing the results of this analysis should be prepared. Once the individual analysis is complete, the alternatives will be compared and contrasted to one another with respect to each of the evaluation criteria.

RPM Note: The RI report can be combined with the FS report to form an RI/FS report, but the RI and FS reports also can be submitted separately. The RI section of the RI/FS report should present the methods used for the RI, the updated CSM resulting from the investigation, the results of the risk assessments, a determination of whether further remedial action is needed, and if so, the recommended remedial action objectives. The primary focus of the FS report is to ensure that appropriate remedial alternatives are developed and evaluated in such a manner that the information can be presented to a decision-maker and an appropriate remedy selected. Development of alternatives shall be fully integrated with the site characterization activities of the RI, and the combined RI/FS leads to the selection of an optimal response action for the site.

The recommended format to follow for the RI and FS sections of the report are provided in Table 8-1 and Table 8-3 of the Department of the Navy Environmental Restoration Program Manual.

The decision tree at the end of this document: Characterization and Remediation of Closed Small Arms Firing Range Soils will help to provide a list of available decisions and alternatives that may be evaluated in the RI/FS. This graphic is from the Interstate Technology and Regulatory Council's "Characterization and Remediation of Soils at Closed Small Arms Firing Range", January 2003.

Community Relations Plan (CRP)

The contractor will be responsible for setting up and documenting community interviews in order to produce the CRP. Interviews will be conducted with FEC personnel and local officials, residents, public interest groups, and other interested or affected parties to ascertain community concerns, community information needs, and how or when citizens would like to be involved in the CERCLA process. The contents of the CRP should include the following: background and history of community involvement at the site including local activity and interest plus key issues; site history including environmental history; objectives of the ER Program; community involvement activities to meet the ER Program objectives; and a list of officials, citizen/community groups, and media contacts. The CRP shall be submitted in preliminary/internal draft for Navy review, draft for full regulatory review, and final after comments are addressed.

RPM Note: The Community Relations Plan documents the history of community relations and the issues of community concern at a site. It describes the objectives of the community relations activities and how these objectives will be met and includes a discussion of planned community interviews, fact sheets, and public meetings. The Navy Environmental and Natural Resources Program Manual (OPNAVINST 5090.1B, 01 Nov. 1994) and Marine Corps Environmental Compliance and Protection Manual (MCO P5090.2A, 10 July 1998) provide public participation guidance.

DON's policy is to prepare CRPs for specific installations rather than for specific actions, the CRP may have additional requirements beyond those specified in CERCLA and, therefore, the RPM should check the installation's CRP to ensure that all requirements

are being met. If necessary a CRP should be developed. Otherwise, community relations activities should support the existing CRPs (most cases).

7.0 PROJECT MANAGEMENT

The contractor shall perform project management activities necessary to maintain project control and to meet reporting requirements, including but not limited to the following:

7.1 Schedule

The contractor will prepare a comprehensive project schedule which shall be due within [insert weeks/months] after project award. The schedule will be prepared using MS Project and provided in hardcopy and electronically in native format and may be required as a .PDF file as well. The contractor shall update the schedule monthly and provide this as an electronic deliverable (email only for this electronic deliverable) to the RPM. The contractor shall coordinate critical deliverable dates with the RPM. [Insert any critical schedule requirements here, such as Federal Facility agreements or other agreements]

7.2 Meetings and Project Coordination

7.2.1 Pre-Bid and Kickoff Meetings

A pre-bid site visit [will/will not] be conducted by the Government. The pre-bid site visit will occur, [provide the date, time, assembly place, etc. for the visit]. The Government will prepare an abbreviated Site Safety and Health Plan to cover the site visit. If necessary, a request for an ESS determination will be prepared by the government for submittal to NOSSA/MARCORSYSCOM prior to the site visit.

RPM Note: The need for a pre-bid site visit will depend on the information available from the PA and/or SI and the contractor's familiarity with the site and your selected contract mechanism. A pre-bid site visit may be required for contract mechanisms where the SOW is sent to several bidders.

The contractor shall plan to attend a kickoff meeting/formal site visit at [insert site or Facilities Engineering Command (FEC)]. Attendees of this meeting may include the Navy RPM, Environmental Coordinators and others from the site and various FEC personnel. At a minimum, the contractor's Project Manager and/or Technical Lead for this project shall attend. Regulators and stakeholders may be included as determined by the RPM. The agenda for this meeting will include discussions of roles and responsibilities, emergency response, health and safety, access to the site, project schedule, explosives safety, contracted deliverables, investigation methodology, and other issues related to the delivery order. The contractor shall provide a written meeting agenda to all invited participants not less than [insert number of days] prior to the scheduled meeting, coordinate with the RPM to arrange meeting facilities, and provide invited participants written meeting minutes within [insert number of days] after the meeting.

7.2.2 Project Meetings

The contractor shall coordinate and attend [insert number] additional meetings at [insert location] to be held at the discretion of the RPM. Attendees normally include regulators and stakeholders. To the extent possible, it is recommended to schedule project meetings during times when the contractor's staff are already visiting [insert location] for project-related duties. Teleconference and web enabled meetings may also be necessary. The contractor is responsible for agendas and minutes of all meetings. The contractor will provide an agenda, via

e-mail, no less than [insert number] days prior to any meeting to participants identified by the RPM. For meetings involving review of a deliverable, include a brief synopsis of the latest comments and recommendations for the deliverable. The contractor will provide invited participants written meeting minutes within [insert number] days after the meeting.

8.0 SUBMITTALS AND CORRESPONDENCE

8.1 Format for Reports

The final RI/FS Report shall consist of a black and white master adequate for printing and copying on 8 1/2" X 11" paper size. It is permissible to use foldout sheets as long as the eleven-inch vertical dimension is retained. Maps should be in color to easily distinguish the various features, however, the contractor must ensure that critical data are not lost if the map is reproduced in black and white. Deliverables, other than Draft, shall contain a "Response to Comments" (RTC) table indicating how each regulatory agency comment was addressed. All draft and final submittals must be letter quality; all pages must be numbered with chapter number followed by page number (1 1, 1 2, 1 3, 2 1, 2 2, 2 3, etc.). Appendix documentation submittals must be letter quality with all pages numbered (A 1, A 2, B 1, B 2 etc.).

In general, figures and/or maps should be scaled to conform to an engineering scale, to facilitate easy measurement of distance. This does not apply to vicinity maps, areal photographs, or other figures and maps where this would not be appropriate or useful.

8.2 Electronic Deliverables of Records

The electronic version/file of the preliminary/internal draft, draft, and final after comments are addressed shall be submitted in both A) the native format, which Navy prefers be a Microsoft product, and B) Adobe Acrobat .PDF (or compatible) format. The .PDF version of all final deliverables (other than raw analytical and databases) must be a complete, mirror image of the hardcopy, and include appendices, maps, signature pages, etc. At completion of the project with the Final RI/FS Report submittals, the contractor will provide an electronic deliverable with a copy of all reports, meeting minutes, point papers, maps and map databases, and briefings. All electronic submittals will be certified "virus free" and include the statement "virus free" on the disk or transmittal message. The contractor shall verify, with the RPM, the appropriate data management requirements and electronic data deliverables.

8.3 Spatial and Non-Spatial Data Standards

RPM Note: NIRIS is designed to manage both IR and MRP site data using GIS and other end user tools. Training on the use of NIRIS for both RPMs and contractors started at most FECs in 2008. Coordinate with your local IR GIS Data Management Workgroup member regarding access and training for NIRIS and mapping needs. NIRIS can be linked to Regional Shore Installation Management System (RSIMS) for local basemap data, real estate parcel information and aerial photography for most sites, and NIRIS is NMCI compatible. All ER data must be submitted via the NIRIS EDDs and automated data checker. NIRIS should be used for MRP projects mapping needs, however, if there is an existing, legacy system with data to migrate to NIRIS, or specialized applications or tools, talk to your local IR GIS Data Management Workgroup member. NIRIS can be located on the NAVFAC Portal by navigating to the "employees" side, clicking on "eTools", clicking on "more eTools" and scrolling down to NIRIS

Spatial data such as maps, CADD drawings, aerial photos, etc. may be required in support of the project. All CADD and Geographic Information Systems (GIS) graphics deliverables shall be compliant with the latest Navy and DOD spatial data requirements i.e., Naval Installation Restoration Information Solution (NIRIS) Non-NEDD Deliverable Submittal Guidelines SOP).

8.4 Geographic Information Systems (GIS) Deliverables

MRP data is inherently spatial in nature. A GIS shall be used to facilitate decision making, perform analysis and visualize results, to ensure effective cleanup decisions are made in cooperation with the Navy, regulators, and other stakeholders. GIS data may include: past and present uses, site conditions, historical photographs, land use controls (LUCs), geophysical data, MEC findings data, and MC data collected throughout the RI/FS. The Government will provide the contractor access to NIRIS and provide the initial base mapping data and information on the format of the data. The NIRIS Non-NEDD Deliverable Submittal Guidelines SOP contains detailed requirements and specifications and should be used for all GIS deliverables.

The contractor shall update and manage the project GIS in NIRIS, or if needed, an export of the NIRIS data using a local machine running ArcGIS or ArcInfo. Any project related spatial data including maps, models and associated collected or created data must then be submitted back to NIRIS according to the NIRIS Non-NEDD Deliverable Submittal Guidelines SOP. This would include daily geophysical data, MEC related items found during the investigation, positively identified MEC, positively identified archeological sites, environmental sample locations, inaccessible areas such as brush piles, fence lines, areas of bare rock, etc.

8.5 Electronic Data Deliverables

All tabular data such as MC analytical results by location shall be provided using the appropriate NIRIS Electronic Data Deliverable according to the NEDD Standard Operating Procedure using the NIRIS web based data checker.

8.6 Administrative Record File (ARF)

The contractor will **establish or maintain** an ARF during this phase of the project. All documents will be prepared and indexed for inclusion in the ARF.

RPM Note: Information regarding the establishment of AR Files can be found in “Final Guidance on Administrative Records for Selecting CERCLA Response Actions” OSWER 9833.3A-1, Dec 1990 and in NAVFAC’s “CERCLA Interim Administrative Records Management System Users Guide” UG-2024-ENV, Dec 2000.

8.7 Public Affairs

The contractor shall not disclose any data resulting from actions in this contract to the news media, the public, regulatory agencies, or any other non-project-involved personnel. The contractor shall refer all press or public contacts to the RPM. The contractor may not distribute reports or data to any other source, unless specifically authorized, in writing, by the Public Affairs Officer in accordance with NAVFAC Instruction 5720.10A. All project-related materials become permanent property of the United States Government.

8.8 Distribution

Deliverables must be approved by the RPM prior to distribution (see Table 1). [RPM should make below chart specific to your SOW]

Table 1. Schedule of Deliverables

Deliverable	# of Hard Copies/Disks			Due Date
	RPM	Activity/ Installation	Regulatory/ Other	
<i>RI/FS Work Planning Documents</i>				
Project Schedule	1/1	0/0	0/0	2 weeks from award
ESS Determination (RPM responsible for submission and determination from NOSSA)	1/1	1/1	2/0	30 days from award
Draft RI Work Plan	0/3	0/0	0/0	30 days from award
Gov't comments				1 week
Draft Final RI Work Plan and Supporting Documents				
All review comments				
Final RI Work Plan	1/1	1/1	0/0	1 week
<i>RI/FS REPORT</i>				
Draft RI/FS Report	1/1	1/1	0/0	180 days from award
Navy Review/comment				200 days from award
Draft-Final RI/FS Report	1/1	1/1	1/1	220 days from award
All Review/Comment				250 days from award
Final RI/FS Report	2/2	1/1	1/1	280 days from award

9.0 SPECIAL CONDITIONS

The contractor will obtain written approval from the appropriate installation personnel [insert location and phone number] prior to obtaining photographic records, still or motion pictures, and aerial or ground photographs; in accordance with Public Law 18 U.S. Code 795 and applicable Station Regulations. The Government may provide a representative to act in an advisory capacity to prevent unauthorized disclosure of classified information.

Any oral directions, instructions, explanations, commitments and/or acceptances given by any government employee to the contractor, shall not be construed by the contractor as a change in scope to this delivery order. Any change in scope of work must be issued to the contractor, in writing, by the Contracting Officer in order to be binding to the government.

The contractor shall provide copies of all project correspondence to the RPM as well as synopses of all phone conversations with regulators in a timely manner. The RPM is to be copied on all electronic correspondence with FEC and Installation/Activity representatives, and others as appropriate and as requested by the RPM.

The contractor shall organize, furnish, maintain, supervise, and direct a work force, which, within the limitations of the provisions of the contract, is thoroughly capable and qualified to effectively perform the work set forth in this delivery order. The contractor will ensure that personnel have been appropriately trained for the tasks and duties assigned. The contractor will maintain and provide upon request, records of training and qualifications of individuals involved in the project.

The contractor and his employees and subcontractors shall become familiar with and obey installation regulations, including fire, traffic, and security regulations. Contractor personnel employed on the installation shall keep within the limits of the work (and avenues of ingress and egress), and shall not enter restricted areas unless required to do so and are cleared for such entry. The contractor's equipment shall be conspicuously marked for identification.

Permit Equivalency for CERCLA On-site Response Actions: CERCLA on-site response actions are exempted by law from requirements to obtain Federal, State or local permits related to any activities conducted completely onsite [CERCLA Section 121(e)]. However, the substantive provisions of the permitting regulations that are applicable or relevant and appropriate, must be met. Expenses to obtain on-site permits that are exempt under CERCLA are not normally reimbursable.

Identification badges and vehicle passes will be furnished without charge; application for and use of passes will be specified by [insert Installation/Activity] Installation Security when issued. Immediately report lost or stolen passes to [insert Installation/Activity] Installation Security and, in writing, to the Contract Specialist (CS) and RPM. Issuance will be coordinated through the RPM.

10.0 REFERENCES

References: (RPM to determine all that are applicable and add site specific references. The RPM should also update the list to include the most recent issuance of any document or instruction)

- **NAVSEA OP-5**, Vol. 1, Seventh Revision, “Ammunition and Explosives Ashore Safety Regulations for Handling, Storing, Production, Renovation and Shipping”.
- **NOSSA Instruction 8020.15 (Series)**, “Explosives Safety Review, Oversight, And Verification Of Munitions Responses”
- OPNAV INSTRUCTION 8020.15/MCO 8020.13 (series), “Explosives Safety Review, Oversight, And Verification of Munitions Responses
- Department of the Navy Environmental Restoration Program Manual, August 2006
- Federal Regulation 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER)
- **PA/SI report or Archives Search Report of installation**
- **Installation Master Plan**
- IRP Initial Assessment Study/Preliminary Assessment/Site Inspection and other IRP reports related to the site
- Environmental Baseline Survey or Environmental Condition of Property
- Integrated Natural Resources Management Plan
- Military Munitions Rule [Federal Register: February 12, 1997 (Volume 62, Number 29)]
- DOD Policy to Implement the EPA’s Military Munitions Rule (July 1, 1998)
- DODD 4715.11E, Environment, Safety, and Occupational Health (ESOH) (March, 2005)
- Handbook on the Management of Munitions Response Actions, USEPA (Draft Final May 2005)
- Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA Section 120 (h) 42 U.S.C. Section 9620) and as amended by the SARA of 1986
- Community Environmental Response Facilitation Act (CERFA), Public Law 102-426 (Oct 19, 1992)
- The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Part 300, Chapter 40, CFR
- USACOE, Implementation of Incremental Sampling (IS) of Soil for the Military Munitions Response Program, USACE Interim Guidance 09-02, July 20, 2009
- USACOE, Military Munitions Response Actions, EM 1110-1-4009, June, 2007
- USACOE, Military Munitions Center of Expertise, Technical Update for Munitions Constituents (MC) Sampling, March 2005
- US Navy, Conducting Human Health Risk Assessments Under the Environmental Restoration Program (Ser N453E/10595168, 12 Feb. 2001);
- US Navy, Navy Policy for Conducting Ecological Risk Assessments (Ser N453E/9U595355, 05 Apr. 1999)
- US Navy, U.S. Navy Human Health Risk Assessment Guidance”, December 2008.
- US Navy, Navy guidance for conducting an ecological risk assessment is provided online at <http://web.ead.anl.gov/ecorisk/>
- Baer, K.N., D. Hutton, R. Boer, T. Ward, and R. Stahl. 1995. “Toxicity evaluation of trap and skeet shooting targets to aquatic test species. *Ecotoxicity* 4: 438–392.
- USEPA SW 846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Method 8330B Nitroaromatics, Nitramines and Nitrate Esters by High Performance Liquid Chromatography and Method 8321A Solvent Extractable Nonvolatile Compounds by High Performance Liquid Chromatography/Thermospray/Mass Spectrometry (HPLC/TS/MS) or Ultraviolet (UV) Detection
- DoD EDQW Guide for Implementing EPA SW-846 Method 8330B

- USEPA A Guide to Developing and Documenting Cost Estimates During the Feasibility Study. EPA 540/R-D0/002, OSWER 9355.0-75
- USEPA Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final (October 1988) EPA 540/G-89/004, OSWER 9355.3-01
- USEPA Getting Ready: Scoping the RI/FS (November 1989) OSWER 9355.3-01FS1, NTIS: PB90-274390INX
- USEPA The Feasibility Study, Development and Screening of Remedial Action Alternatives (November 1989) OSWER 9355.3-01FS3, NTIS: PB90-274416INX
- The Feasibility Study: Detailed Analysis of Remedial Action Alternatives (March 1990) OSWER 9355.3-01FS4, NTIS: PB90-272675INX
- USEPA The Remedial Investigation, Site Characterization and Treatability Studies (November 1989) OSWER 9355.3-01FS2, NTIS: PB90-274408INX
- USEPA Superfund Community Involvement Handbook EPA/540/K-01/003, Apr. 2002
- USEPA Uniform Federal Policy for Quality Assurance Project Plans Manual, March 2005
- ITRC, Characterization and Remediation of Soils at Closed Small Arms Firing Ranges, January 2003
- USACOE, Propellant Residues Deposition from Small Arms Munitions, ERDC/CRREL TR-07-17, September 2007
- AFCEE, Technical Protocol for Determining the Remedial Requirements for Soils at Small-Arms Firing Ranges, August 2000
- NAVFAC Uniform Federal Policy –Sampling and Analysis Plan Template, (See your FEC QA POC for the latest version)
- ITRC, Environmental Management at Operating Outdoor Small Arms Firing Ranges, February 2005.

The Navy will provide an installation map of the subject property.

11.0 DEPARTMENT OF THE NAVY POINTS OF CONTACT

Remedial Project Manager (RPM):

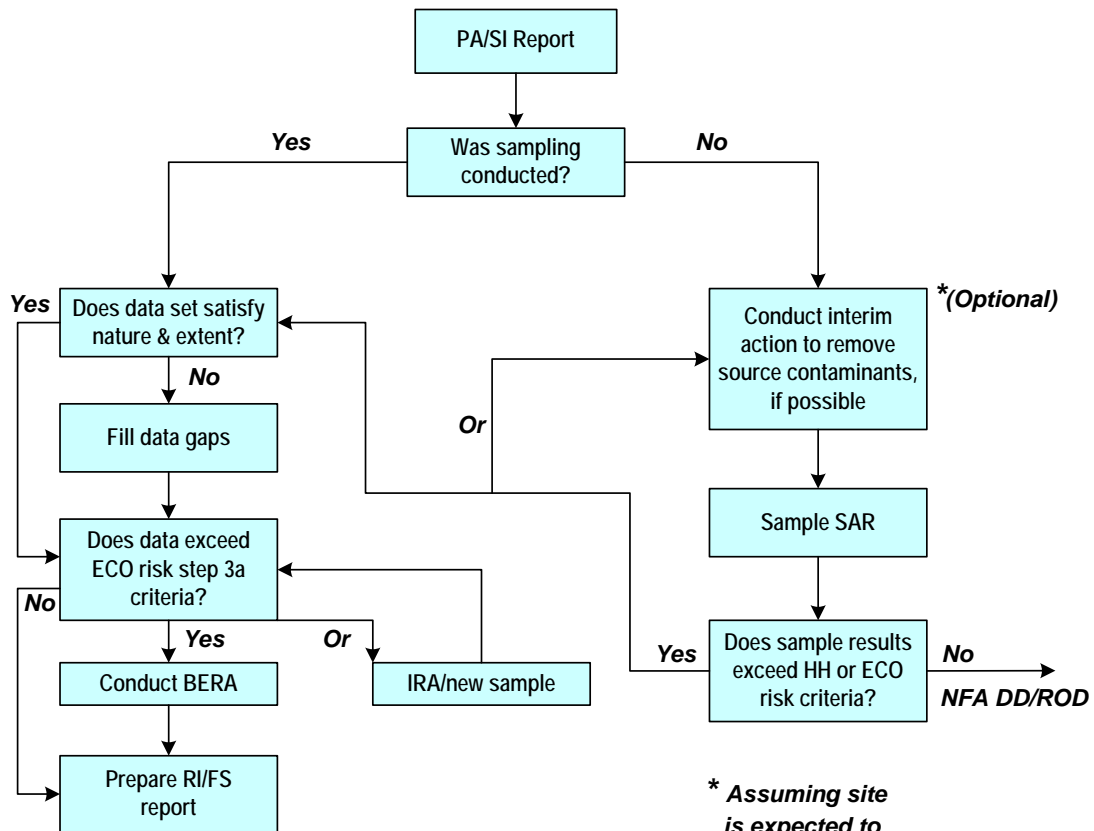
Name:
Address:
Phone:
Fax:
Email:

Contract Specialist (CS):

Name:
Address:
Phone:
Fax:
Email:

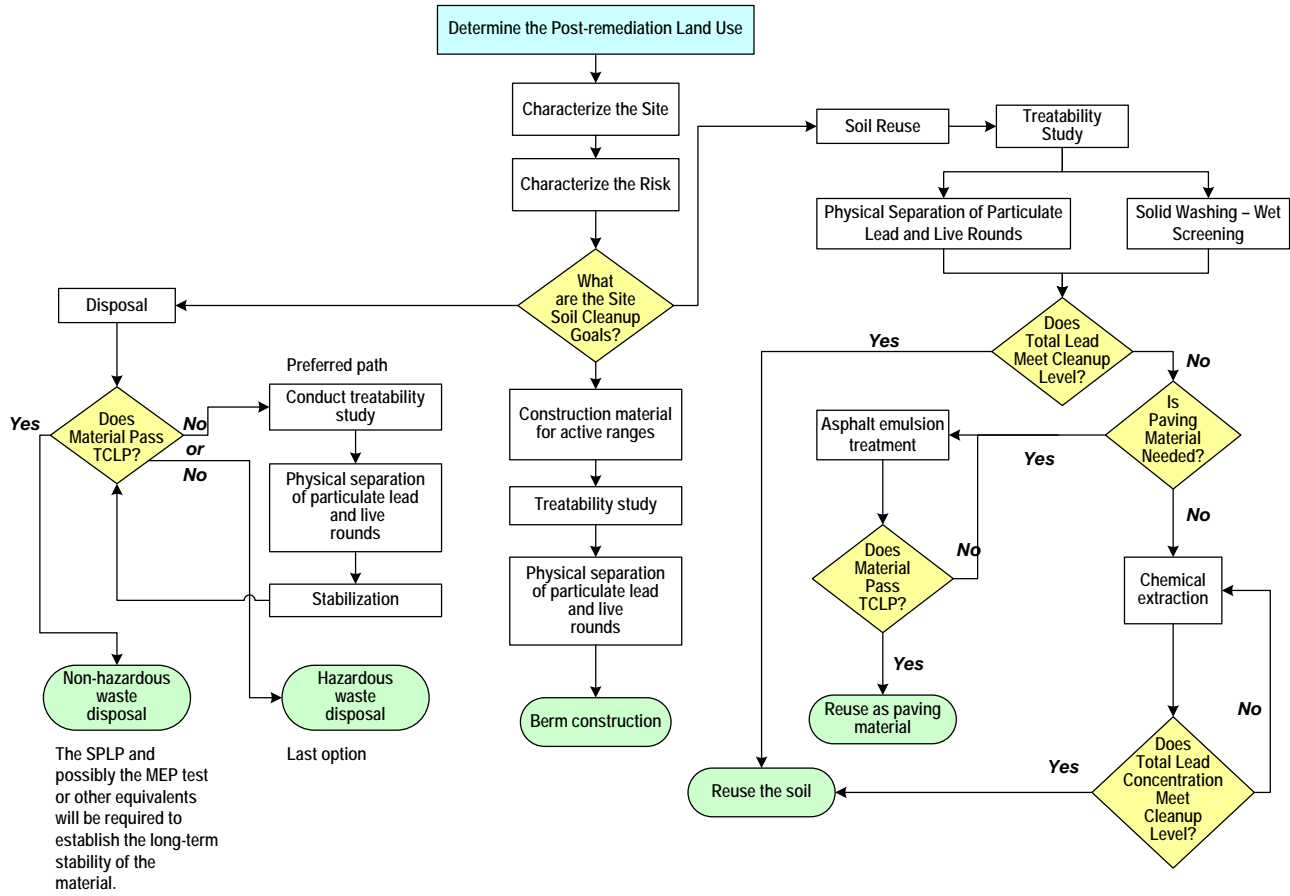
Activity/Installation Point of Contact (POC):

Name:
Address:
Phone:
Fax:
Email:



** Assuming site is expected to require remediation based on visual evidence.*

RI Flow Chart



Decision Tree: Characterization and Remediation of Closed Small Arms Firing Range Soils, adapted from ITRC's Characterization and Remediation of Soils at Closed Small Arms Firing Ranges, January 2003.