

N42237.AR.001204  
NSB KINGS BAY  
5090.3a

BASEWIDE MUNITIONS RESPONSE PROGRAM PRELIMINARY ASSESSMENT WORK  
PLAN NSB KINGS BAY GA  
10/19/2012  
RESOLUTION CONSULTANTS

**MUNITIONS RESPONSE PROGRAM  
BASEWIDE PRELIMINARY RANGE ASSESSMENT  
WORK PLAN**

**NAVAL SUBMARINE BASE (NSB) KINGS BAY, GEORGIA**

**Revision: 0**

**Resolution Consultants Job Number:  
0888812553**

**Prepared for:**



**Department of the Navy  
Naval Facilities Engineering Command, Atlantic  
6506 Hampton Blvd.  
Norfolk, Virginia 23508-1278**

**Comprehensive Long-Term Environmental Action Navy  
Contract Number N62470-11-D-8013  
CTO JM15**

**Prepared by:**



**Resolution Consultants  
*A Joint Venture of AECOM & EnSafe*  
448 Viking Drive, Suite 145  
Virginia Beach, Virginia 23452**

**October 19, 2012**

**BASEWIDE MUNITIONS RESPONSE PROGRAM  
PRELIMINARY ASSESSMENT WORK PLAN  
NAVAL SUBMARINE BASE (NSB) KINGS BAY, GEORGIA**

Revision: 0

Resolution Consultants Job Number:  
0888812553

Prepared for:



Department of the Navy  
Naval Facilities Engineering Command, Atlantic  
6506 Hampton Blvd.  
Norfolk, Virginia 23508-1278

Comprehensive Long-Term Environmental Action Navy  
Contract Number N62470-11-D-8013  
CTO JM15

Prepared by:



**RESOLUTION  
CONSULTANTS**

Resolution Consultants  
*A Joint Venture of AECOM & EnSafe*  
448 Viking Drive, Suite 145  
Virginia Beach, Virginia 23452

October 19, 2012

Prepared By:

A handwritten signature in black ink, appearing to read "D. Warren", written over a horizontal line.

David A. Warren  
*Project Manager*

Reviewed By:

A handwritten signature in black ink, appearing to read "R. Swahn", written over a horizontal line.

Rick Swahn  
*Senior Technical Advisor*

## Table of Contents

ACRONYM LIST.....	iii
1.0 INTRODUCTION.....	1-1
1.1 Objective .....	1-1
1.2 Work Plan Organization.....	1-1
2.0 PROJECT APPROACH .....	2-1
2.1 Scope of Work .....	2-1
2.2 PA Process .....	2-2
2.3 Definitions.....	2-3
3.0 PROGRAM MANAGEMENT .....	3-1
3.1 Team Organization .....	3-1
3.1.1 Naval Facilities Engineering Command Southeast.....	3-1
3.1.2 Naval Facilities Engineering Command.....	3-1
3.1.3 Naval Ordnance Safety and Security Activity .....	3-1
3.1.4 NSB Kings Bay.....	3-2
3.2 Resolution Consultants Contractor Support .....	3-2
3.2.1 Roles and Responsibilities.....	3-2
3.3 Project Coordination.....	3-4
3.3.1 Coordination and Communications with NAVFAC Southeast .....	3-4
3.3.2 Coordination and Communications with NAVFAC.....	3-4
3.3.3 Coordination and Communications with Navy Installations.....	3-4
3.3.4 Coordination and Communications with Regulators.....	3-4
3.3.5 Progress Reporting.....	3-5
4.0 DATA QUALITY OBJECTIVES.....	4-1
5.0 DATA COLLECTION METHODOLOGY .....	5-1
5.1 Offsite Data Collection.....	5-1
5.1.1 Navy CTT Range Inventory Database .....	5-1
5.1.2 Installation Web Site .....	5-1
5.1.3 Local and National Archives .....	5-1
5.2 Onsite Data Collection.....	5-2
5.2.1 Kick-Off Call .....	5-2
5.2.2 Pre-Visit Planning Package.....	5-2
5.2.3 Kick-Off Meeting .....	5-3
5.2.4 Onsite Records Search .....	5-4
5.2.5 Onsite Interviews.....	5-4
5.2.6 Data Compilation and Validation.....	5-6
5.2.7 Exit Briefing.....	5-6
5.2.8 Follow-Up Site Visit .....	5-6
5.2.9 Site Reconnaissance.....	5-7
5.3 Data Elements.....	5-8
5.3.1 Site Location and History .....	5-8
5.3.2 Physical Setting .....	5-8
5.3.3 MEC/MC Release Information.....	5-9

5.3.4	Land Use and Exposure Profile .....	5-10
6.0	DATA REVIEW/ANALYSIS.....	6-1
6.1	Need for Immediate Response.....	6-1
6.2	UXO Evaluation/Site Characterization .....	6-2
6.2.1	UXO Concentrations .....	6-2
6.2.2	Site Type.....	6-2
6.2.3	Ordnance Type and Fillers.....	6-3
6.2.4	Penetration Depth .....	6-4
6.2.5	Special Attention Ordnance .....	6-5
6.3	Conceptual Site Model Development.....	6-7
7.0	DEFENSE SITE PRIORITIZATION.....	7-1
8.0	DELIVERABLES .....	8-1
9.0	QUALITY ASSURANCE/QUALITY CONTROL.....	9-1
10.0	SCHEDULE.....	10-1
11.0	REFERENCES.....	11-1

### **Figures**

Figure 10-1	MMRP Basewide Preliminary Range Assessment Project Schedule NSB Kings Bay Updated 08/01/12 .....	10-2
-------------	-----------------------------------------------------------------------------------------------------	------

### **Tables**

Table 3-1	Resolution Consultants Roles and Team Members .....	3-2
Table 6-1	Site Types and Default Densities .....	6-3
Table 6-2	Ordnance Types and Penetration Depths .....	6-6
Table 6-3	Examples of U.S. Ordnance That Contain Depleted Uranium.....	6-7

### **Appendices**

Appendix A	Health and Safety Plan
Appendix B	Pre-Site Visit Planning Package

## Acronym List

AOC	Area of Concern
CAIS	Chemical Agent Identification Set
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	Conceptual Site Model
CTT	Closed, Transferred, and Transferring
CWM	Chemical Warfare Materiel
DERP	Defense Environmental Restoration Program
DMM	Discarded Military Munitions
DOD	Department of Defense
DQO	Data Quality Objective
DU	Depleted Uranium
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
ESS	Explosive Safety Submission
GIS	Geographic Information System
GPS	Global Positioning System
HASP	Health and Safety Plan
HE	High Explosive
ICN	Incendiary
INT	Inert
MC	Munitions Constituent
MEC	Munitions and Explosives of Concern
MMRP	Military Munitions Response Program
MSR	Monthly Status Report
NARA	National and Records Administration
NAVFAC	Naval Facilities Engineering Command Southeast
NOSSA	Naval Ordnance Safety and Security Activity
PA	Preliminary Assessment
PM	Project Manager
POC	Point of Contact
PRAC	Practice Spotting Charges
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
RG	Record Group
RPM	Restoration Program Manager

## Acronym List (cont.)

SMK	Smoke
TOM	Task Order Manager
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance

## **1.0 INTRODUCTION**

At the request of the Naval Facilities Engineering Command (NAVFAC) Southeast, Resolution Consultants has prepared this Basewide Preliminary Assessment (PA) Work Plan for Military Munitions Response Program (MMRP) ranges and sites at Naval Submarine Base (NSB) Kings Bay, Georgia. MMRP ranges and sites are defined as other than operational ranges, including closed, transferred and transferring (CTT) ranges and sites that contain unexploded ordnance (UXO), munitions and explosives of concern (MEC) and/or munitions constituent (MC), and/or discarded military munitions (DMM).

### **1.1 Objective**

The MMRP, as established by applicable Defense Environmental Restoration Program (DERP) Management Guidance and the 2002 Defense Authorization Act, provides guidance and methods for establishing an inventory of military ranges. Upon completing the inventory, additional data collection at the installation level, is accomplished through the PA process.

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the objective of the PA is to determine if MEC and/or MC sites pose threats to human health or the environment and if so, identify if the nature of the threat is from explosive hazard, MC contamination, or both, and then set priorities for further investigation, as deemed necessary.

Furthermore, the PA is intended to provide information necessary to eliminate from further consideration those areas that pose no threat to public health or the environment; differentiate MEC and/or MC sites that may not require further action from MEC and/or MC sites that will require further investigation and/or response action; and determine if an imminent hazard is present, thus requiring an accelerated response.

### **1.2 Work Plan Organization**

This Work Plan is organized into the following sections:

Section 1 — Introduction

Section 2 — Project Approach

Section 3 — Program Management

Section 4 — Project Planning

Section 5 — Data Collection Methodology

Section 6 — Data Analysis



- Section 7 — Prioritization
- Section 8 — Reporting Requirements
- Section 9 — Quality Assurance/Quality Control Procedures
- Section 10 — Project Schedule
- Section 11 — References

In addition to the above sections, a project Health and Safety Plan (Appendix A) and Pre-Site Visit Planning Package (Appendix B) are included.

At the direction of the Navy, Resolution Consultants referenced the *Final Navy Programmatic Work Plan for Preliminary Assessment on MMRP Ranges and Sites* (Malcolm Pirnie, 2003) in developing **this document**. **Malcolm Pirnie's programmatic work plan was** used for PA efforts successfully completed at numerous Navy installations from 2003 through 2011.

## **2.0 PROJECT APPROACH**

### **2.1 Scope of Work**

The scope of work for this project was developed to meet the requirements of the Statement of Work for MMRP Basewide Preliminary Range Assessment for NSB Kings Bay prepared by NAVFAC Southeast, originally dated February 2010. Additional information was gathered in responses to questions, as provided in a 2012, May 21 email, from the Navy, and through a 2012, June 26 teleconference.

The PA will consist of a limited-scope investigation, including the collection and review of historical records, supplemental data collection, and visual observations made during follow-up site visits, if warranted, and associated reporting. Applicable U.S Environmental Protection Agency (EPA) and Department of Defense (DoD) reference and policy documents include, but are not limited to, the following:

- EPA (1992, September). Guidance for Performing Site Inspections Under CERCLA; Interim Final. Retrieved from: <http://www.hanford.gov/dqo/project/level5/sicercla.pdf>
- EPA Federal Facilities Remedial Site Inspection Summary Guide. (2005, July). Retrieved from: [http://www.epa.gov/fedfac/pdf/ff\\_si\\_guide.pdf](http://www.epa.gov/fedfac/pdf/ff_si_guide.pdf)
- U.S. Army Corps of Engineers (USACE). Guidance on Ordnance and Explosive Response Actions under the DERP for Formerly Used Defense Sites.
- Department of the Navy. (2005, January 30). Navy Munitions Response Program (MRP) Guidance.
- Department of the Navy. (2009, January 26). OPNAV Instruction 8020.15B, Explosives Safety Review, Oversight, and Verification Munitions Response.
- Interstate Technology Regulatory Council. (2003). Manual for Munitions Response Historical Records Reviews.
- Munitions Work Group. (Web site). (2012). Retrieved from: <http://www.ert2.org/t2mrportal/>

The PA uses data from previous environmental investigations, archival records, interviews, and visual observations to identify areas of concern (AOCs) and assesses risks, with respect to MEC and/or MC. All activities will be performed in accordance with Resolutions Consultants project-specific Health and Safety Plan (HASP) included as Appendix A.

## **2.2 PA Process**

The PA process includes the following components:

1. Development of work plan to provide details on project approach, management, methodology, reporting, schedule, quality assurance (QA), and health and safety.
2. Review of archival records available at local, national, Navy, and DoD archives.
3. Collection and review of relevant data maintained at the installation level. These data will include, but not limited to historical records, aerial photography, historical facility maps, construction drawings, shipping records, records of previous clearance activities, and records of disposal or open burning/open detonation activities.
4. Interview employees with knowledge of former and current munitions activities at NSB Kings Bay.
5. Visual site reconnaissance at AOCs (suspected MEC/MC sites), as identified during data collection.
6. Data review/analysis to determine historical uses, potential risks, and prioritization/need for response action.
7. Preparation of PA Report to document findings.

Steps, as defined above, are detailed in Sections 5.0 through 8.0 of this work plan. Project QA procedures, as outlined in Section 9.0, will be implemented for each step to ensure that data quality objectives (as described in Section 4.0) are achieved.

## **2.3 Definitions**

The following are key terms associated with the PA:

**Closed Range** — A Military Range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a DoD component. Closed ranges cannot occupy an area that has been identified as an active or inactive range. Closed ranges are those areas of land that used to be active/inactive ranges, and are still owned by the Navy/DoD, but are now used for non-range purposes.

**Defense Site** — All locations that are or were owned by, leased to, or otherwise possessed or used by the DoD. The term does not include any operational range, operating storage, manufacturing facility, or facility that is used for or was permitted for the treatment or disposal of military munitions.

**Discarded Military Munition** — A military munition that has been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal (does not include items that are being held for future use or planned disposal or items that have been properly disposed of consistent with applicable laws and regulations).

**Explosives and Munitions Emergency Response** — All immediate response activities by an explosives and munitions emergency response specialist to control, mitigate, or eliminate the actual or potential threat encountered during an explosives or munitions emergency. An explosives or munitions emergency response may include in-place, render-safe procedures, treatment or destruction of the explosives or munitions, and/or transporting those items to another location to be rendered safe, treated, or destroyed. Any reasonable delay in the completion of an explosives or munitions emergency response caused by a necessary, unforeseen, or uncontrollable circumstance will not terminate the explosives or munitions emergency. Explosives and munitions emergency responses can occur on either public or private lands and are not limited to responses at Resource Conservation and Recovery Act facilities.

**Military Munitions** — All ammunitions products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics,

chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and device and components thereof.

**Military Range** — Designated land and water areas set aside, managed, and used to conduct research on, develop, test, and evaluate military munitions and explosives, other ordnance, or weapons systems, or to train military personnel in their use and handling. Ranges include firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, and buffer zones with restricted access and exclusionary areas.

**Munitions and Explosives of Concern** — Military Munitions that are UXO or abandoned or discarded; soil with high enough concentrations of explosives to present an explosive hazard; or facilities, equipment, or other materials contaminated with a high enough concentration of explosives such that it presents an explosive hazard.

**Munitions Constituents** — Any materials that originate from UXO, DMM, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

**Operational Range** — A military range that is used for range activities, or a military range that is not currently being used, but that is still considered by the Secretary of Defense or the Secretary of a military department to be a range, is under the jurisdiction, custody, or control of the DoD or of a military department, and has not been put to a new use that is incompatible with range activities.

**Site** — A “site” as defined by CERCLA is an area consisting of the aggregation of sources, the areas between the sources, and areas that may have been contaminated due to migration from sources; site boundaries are independent of property boundaries.

**Source** — An area where a hazardous substance may have been deposited, stored, disposed, or placed; and soil that may have become contaminated as a result of hazardous substance migration.

**Transferred Range** — A Military Range that is no longer under military control and had been leased by DoD, transferred, or returned from DoD to another entity, including Federal entities. This includes a Military Range that is no longer under military control, but that was used under the terms of an executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the Federal land manager. Additionally, property that was previously used by the military as a range, but which did not have a formal use agreement, also qualifies as a transferred range.

**Transferring Range** — A Military Range that is proposed to be leased, transferred, or returned from the DoD to another entity, including Federal entities. This includes a Military Range that was used under the terms of a withdrawal, executive order, special-use permit, or authorization, right of way, public land order, or other instrument issued by the Federal land manager or Property Owner. **An active range will not be considered a “transferring range” until the transfer is imminent** (generally defined as the transfer date is within 12 months and a receiving entity has been identified).

**Unexploded Ordnance** — Military munitions that have been primed, fused, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and remain unexploded either by malfunction, design, or any other cause.

### **3.0 PROGRAM MANAGEMENT**

#### **3.1 Team Organization**

##### **3.1.1 Naval Facilities Engineering Command Southeast**

NAVFAC Southeast is a component of the Atlantic Division of NAVFAC and performs engineering functions for Navy bases throughout the southeastern United States. NAVFAC Southeast will serve as the Program Manager for the **Navy's** NSB Kings Bay, Georgia PA project. NAVFAC Southeast will provide overall management and guidance; coordinate with relevant U.S. Navy organizations including Navy Installations, NAVFAC, the Naval Ordnance Safety and Security Activity (NOSSA), and other Engineering Field Divisions and Activities; track funding requirements; define achievable schedules and milestones; provide the initial list of MEC and/or MC sites to be evaluated; provide contact information for a primary POC at the installation level; and identify significant issues encountered during the PA process. The Remedial Project Manager (RPM) for NAVFAC Southeast is Mr. Brian Syme. Mr. Dana Hayworth **will serve as NAVFAC Southeast's deputy project manager.**

##### **3.1.2 Naval Facilities Engineering Command**

NAVFAC Environmental Directorate performs environmental work for the Navy through its Engineering Field Divisions and Activities. **NAVFAC manages the Navy's MMRP. It is anticipated** that NAVFAC will review documents and deliverables for the PA and provide input and guidance through CLEAN. NAVFAC will also be responsible for coordinating status and prioritizing sites on a Department of Navy basis with the Chief of Naval Operations. Resolution Consultants will work with NAVFAC Southeast to provide briefings and copies of documents and deliverables to NAVFAC, as needed, throughout the project.

##### **3.1.3 Naval Ordnance Safety and Security Activity**

NOSSA establishes standard policy and procedures for and provides global oversight of Department of Navy explosives safety ordnance physical security, ordnance environmental matters, sensitive munitions, and Naval Sea Systems Command (NAVSEA) ordnance quality evaluation. In addition, NOSSA reviews explosive safety submissions (ESS) for the Navy and provides guidance on safety issues. Resolution Consultants understands that an ESS is not required for this PA. NOSSA may review portions of the PA project deliverables; however, Resolution Consultants will not communicate directly with NOSSA on ordnance related issues unless directed by NAVFAC Southeast.

### **3.1.4 NSB Kings Bay**

Per direction by the NAVFAC Southeast RPM, Resolution Consultants’ will coordinate installation level activities, including data collection and site reconnaissance efforts, with the NSB Kings Bay Activity installation POC. Mr. James Colter will serve as the installation POC for this project.

### **3.2 Resolution Consultants Contractor Support**

Key members of the Resolution Consultants PA team include the Task Order Manager (TOM), Senior Technical Advisor, Data Collection Team Leader, Quality Assurance/Quality Control (QA/QC) Manager, Database/Geographic Information System (GIS) Coordinator, Safety Officer, and support staff. Roles and responsibilities for key positions are described below.

#### **3.2.1 Roles and Responsibilities**

The responsibilities of certain key roles defined in Table 3-1 are outlined below. Please note that roles for the Safety team are defined in the HASP enclosed in Appendix A.

<b>Table 3-1 Resolution Consultants Roles and Team Members</b>	
<b>ROLE</b>	<b>TEAM MEMBER</b>
Task Order Manager	Mr. David Warren
Senior Technical Advisor	Mr. Rick Swahn
Data Collection Team Leader	Ms. Kara Wimble
QA/QC Manager	Mr. Chris Barr
Database/GIS Coordinator	Mr. Scott Swann
Safety Officer	Mr. Steve Skipper

#### Task Order Manager

The TOM will serve as the primary point of contact between the Navy and Resolution Consultants. Furthermore, the TOM is responsible for overall project implementation, including financial, schedule, and technical aspects. The TOM prepares monthly status reports (MSRs). The TOM will maintain close contact with the Navy RPM throughout the process and report any problems or issues as soon as possible.

#### Senior Technical Advisor

The Senior Technical Advisor will leverage previous experience with regards to munitions and PA projects to provide senior level support to the project team and top-level review of the work plan and deliverables.

#### Data Collection Team Leader

The Data Collection Team Leader will be responsible for scheduling, coordinating travel, performing site visits, and reviewing data during the PA effort, including coordination with the installation POC. The Data Collection Team Leader will instruct the support team during data collection and ensure that data are presented to the appropriate installation authorities to help verify the accuracy of the **team's interpretation**. The Data Collection Team Leader will address and follow up on issues that cannot be resolved during the site visit.

#### QA/QC Manager

The QA/QC Manager will oversee development of procedures, training, control checks, and process correction/improvement actions (including those addressed in Section 9.0) to ensure that data are collected, processed, and prepared using the most accurate methods possible. The QA/QC Manager will regularly coordinate with the TOM to ensure that the Navy and contractor QA/QC programs are aligned and that project deliverables are meeting technical performance and accuracy standards.

#### Database/GIS Coordinator

The Database/GIS Coordinator will ensure that the electronic deliverables, including maps and databases, are prepared in accordance with applicable spatial data requirements. The Database/GIS Coordinator will assist the support team with technical aspects of collecting, processing, and delivering data. The Database/GIS Coordinator will also facilitate and review the draft and final electronic data submission, and advise on technical issues that require attention by the Navy.

#### Safety Officer

The Safety Officer assists in the preparation of and provides final review and approval for the project-specific HASP. Furthermore, the Safety Officer provides around the clock safety support during project execution. The Safety Officer works closely with the TOM and support team to ensure potential hazards are adequately recognized and proper safeguards are in place.

#### Support Staff

The TOM will assign additional support staff, as necessary, to meet the requirements of the PA. Typical support personnel include:

- Data Collection Team members

- UXO Qualified Munitions subject matter experts
- GIS technicians to process spatial data for maps
- Word processors and technical editors to compile report

### **3.3 Project Coordination**

The PA effort will involve a number of agencies, organizations, and offices. Coordination and communication will be essential to project success. This section outlines coordination and communication requirements. The Resolution Consultants TOM is responsible for ensuring that the team adheres to requirements outlined in the following subsections.

#### **3.3.1 Coordination and Communications with NAVFAC Southeast**

The Resolution Consultants' TOM will serve as the single point of contact for NAVFAC Southeast providing updates on project schedules, deliverables, and milestones, as well as any contract-related issues to NAVFAC Southeast via the RPM. The RPM will be notified immediately upon any issues, including the presence of potential immediate risks to human health or the environment, changes to the agreed upon project scope of work, or the need to adjust the work plan.

#### **3.3.2 Coordination and Communications with NAVFAC**

It may become necessary to coordinate with NAVFAC for technical clarification and guidance. Resolution Consultants' TOM will coordinate such efforts through the RPM.

#### **3.3.3 Coordination and Communications with Navy Installations**

The TOM and/or the data collection team leader will coordinate with the installation POC during the PA effort. Data Collection Teams will document the names and phone numbers of personnel and offices contacted/interviewed during data collection.

#### **3.3.4 Coordination and Communications with Regulators**

At the direction of the RPM, Resolution Consultants' will prepare project status updates for release by the PRM to regulatory agencies, as deemed appropriate. Such updates also may be provided via teleconferences and/or partnering meetings. Following Navy approval, regulators will be provided with draft versions of work plan and report deliverables for review and comment. Resolution Consultants will provide written responses to Navy or regulatory comments and address final documents accordingly.



### **3.3.5 Progress Reporting**

Resolution Consultants' TOM will work closely with the RPM to keep them updated on progress. Formal progress reporting will be facilitated through MSR submittals. The TOM will immediately report any problems and/or issues that arise during the project to the RPM.

#### **4.0 DATA QUALITY OBJECTIVES**

Data Quality Objectives (DQOs) are qualitative and quantitative statements to guide the development of procedures and methodologies to ensure performance expectations are achieved. DQOs are based on data requirements and acceptable levels of decision errors. Before DQOs can be established, objectives must be clarified, appropriate data types defined, and tolerance limits specified for each data to be used during the decision making process.

The DQO for this PA is to collect sufficient data allowing a decision regarding whether the site requires further action. Specific data elements necessary to satisfy the DQO, along with respective collection methodology and review/analysis protocol are described in Sections 5.0 and 6.0.

## **5.0 DATA COLLECTION METHODOLOGY**

This section describes procedures for collecting data necessary to support the PA.

To document the records collection process and to provide the Navy with information on level of effort, Resolution Consultants will track labor hours required to collect each source of data, including time spent at each archive, conducting each interview, and performing research at each office/command. The intent is to prevent duplication of effort spent on these tasks, should additional research be conducted in the future. Such information on level of effort during the data collection process will be provided to the Navy at the conclusion of the project.

### **5.1 Offsite Data Collection**

Initial offsite research will be conducted to familiarize the data collection team with the installation. Detailed attention will be given to previously identified AOCs. Data will be carefully reviewed to identify new AOCs. Sources to be researched are discussed in the following subsections.

#### **5.1.1 Navy CTT Range Inventory Database**

The Navy CTT Range Inventory Database, which includes details on previously identified MEC and/or MC sites, will serve as the starting point. The Data Collection Team will supplement and refine this information throughout the PA process.

#### **5.1.2 Installation Web Site**

The **installation's web site** will be accessed to obtain any available information pertinent to the PA.

#### **5.1.3 Local and National Archives**

Resolution Consultants will research records available through the National Archives and Records Administration (NARA) for additional information on **the installation's history and potential** MEC and/or MC sites. Applicable materials to be reviewed are maintained in the following five record groups (RGs):

RG 38 — Records of the Office of Naval Operations

RG 71 — Records of the Bureau of Yards and Docks

RG 72 — Records of the Bureau of Aeronautics (Naval Air Installations)

RG 74 — Records of the Bureau of Ordnance

RG 80 — General Records of the Department of the Navy

Pre-1940 records are maintained in Archives I, located in Washington, D.C., while records for years between 1940 and the mid-1950s are stored at the Archives II facility in College Park, Maryland. In **addition, NARA's Cartographic Branch and Still Pictures Branch are** located at the Archives II facility.

NARA also maintains records at regional branches. Resolution Consultants will review regional files maintained in RG 181, Records of the Office of Naval Districts and Shore Establishments, **at NARA's** Atlanta, Georgia, regional office.

## **5.2 Onsite Data Collection**

The data collection team will visit the installation to review records, conduct interviews, and perform site reconnaissance activities, as discussed in the following subsections.

### **5.2.1 Kick-Off Call**

The TOM and/or Data Collection Team leader will contact the installation POC to schedule the site visit. The following information will be obtained during this preliminary kick-off call:

- Available dates for site visit
- Installation hours of operation
- Driving directions
- Contact information for alternate POCs
- Installation security procedures, including the need to provide security clearance data and if sensitive areas exist at the installation

### **5.2.2 Pre-Visit Planning Package**

A pre-visit planning package will be provided to the RPM and installation POC at least two weeks prior to the initial data collection site visit. The package will describe the types of data desired, reiterate the request for support during data collection efforts, and provide a list of data elements desired for each MEC and/or MC site. A sample pre-visit planning package is included in Appendix B.

### **5.2.3 Kick-Off Meeting**

Upon arrival at the installation, the Data Collection Team will meet with the installation POC and other installation personnel (as identified by the installation POC and/or RPM). The following topics will be covered during the kick-off meeting:

- Introduction to the Navy PA Program and the purpose of the visit
- Introduction of personnel
- Summary of previously collected information
- Overview of the type of information sought
- Possible locations of relevant files and other written information sources
- Input regarding potential interview candidates
- Inquiry on existence of additional MEC and/or MC sites
- Anticipated duration of onsite activities
- Logistics for reviewing and copying relevant files
- Sharing of ideas regarding the availability of additional offsite sources of information
- Coordination to obtain GIS coverage for installation and/or suspected sites
- Scheduling and coordination of logistics for follow-up data collection and site reconnaissance efforts (to be performed during a separate mobilization)
- Scheduling of an Exit-Briefing
- A tour of the installation may be necessary to acquaint the data collection team with the layout of the installation and any previously identified potential MEC and/or MC sites

#### **5.2.4 Onsite Records Search**

Following the kick-off meeting, the Data Collection Team will begin reviewing relevant records. Specific offices and organizations to be researched may include Real Estate, Installation Historian/Museum, Range Officer, Explosive Ordnance Disposal (EOD), Engineering, Environmental, Mapping, Public Works, and Public Affairs.

Real estate files, if available, will be used to obtain and/or confirm basic information about the size and layout of the installation, changes to the installation over time, and the ownership and location of MEC and/or MC sites. Real estate records to be reviewed will include available property re-use plans, transfer plans, and installation master plans.

The team will attempt to obtain and review ordnance inventories and Range Control Records (dud books, historical EOD responses, locations of targets and firing points, etc.). Records from previous surface clearances/maintenance and geophysical surveys will be reviewed. Furthermore, the team will research any past reports of accidental encounters with UXO or munitions.

The team will review all available environmental surveys, studies, assessments, and Records of Decision documents for suspected sites and surrounding areas. Such documents will provide information on physical setting, potential for co-location of hazardous materials, down-gradient groundwater quality, and any previous site investigations or remediation actions.

Available maps and aerial photographs, including photogrammetry and orthophotos of suspected range and sites, will be reviewed.

Team members will maintain detailed notes regarding the name, type, location, and general nature of each record reviewed, along with any relevant documents that were identified for photocopying. Notes will be provided to the Navy at the conclusion of the project.

#### **5.2.5 Onsite Interviews**

Resolution Consultants will, as early as possible, and on a continuing basis in conjunction with the records review, schedule interviews with individuals familiar with installation history and MEC/MC use. Potential interviewees will be identified during preliminary research, during the kick-off meeting, through review of relevant documents, or through conversations with installation personnel or officials. Potential interviewees may include base historians, environmental officials, range officers, long-term or former employees, or nearby neighbors knowledgeable on operations and conditions at the ranges.

Objectives of the interview process are to: 1) confirm or refute information collected during the record review, and 2) obtain additional information not available or accessible in such records.

Before requesting an interview, the interviewer will ask a series of basic screening questions to **evaluate the person's knowledge of and experience with the MEC and/or MC site.** This information will be included in the interview questionnaire and will be used in data evaluation.

Basic screening questions include:

- How long have/were you associated with the installation, and what areas on the installation do you know about?
- What is the basis of your knowledge (e.g., personal observation, information from others, or document review)?
- What were your responsibilities or experiences at the installation?
- What do you know about the location(s) and operation(s) of ranges or sites containing MEC and/or MC at the installation?
- Are there others who may know about the location or use of MEC and/or MC sites?

If the person has relevant information, a formal interview will be arranged. Interviews may be conducted in-person or by telephone. In-person interviews will be scheduled to coincide with the data collection visit. Team members may facilitate the process through the use of maps, documents, photographs, and questionnaires.

The interviewer will **ask a series of general and specific questions to discern the interviewee's** knowledge of the ranges/sites used, ordnance deployed, ownership, site history, operations, contractors and/or other companies who operated at the installation, and any other data elements that may be relevant. The interview will conclude by asking the interviewee to identify any additional individuals with relevant knowledge. Interviewees may be contacted again for a follow-up interview, should additional clarification be required.

### **5.2.6 Data Compilation and Validation**

It is anticipated that data will be collected in a variety of media including historical maps, correspondence, photographs, and electronic files. To the extent possible, the collection team will **compile and review collected data nightly to help focus the team's activities for the next day.** Final data compilation and evaluation will be performed once the team returns to their home office. Every effort will be made to collect all available data during the initial site visit; however, the need for follow-up data collection may be required.

To the extent possible, data validation will take place continuously during the data collection process. Information collected from the records search will be cross-referenced with the information collected in the interviews and the limited visual survey.

### **5.2.7 Exit Briefing**

Prior to demobilization, the Data Collection Team leader will provide an exit briefing to the installation POC and designated personnel. The exit briefing will summarize the preliminary results and convey any relevant issues identified during the visit. The relevant materials that were identified, the results of interviews, and a list of individuals still to be interviewed will be discussed along with any significant problems encountered by the team and any items that may require follow-up. The exit briefing is also an opportunity for the Installation Commander or his/her representative to suggest solutions to any problems or to arrange for additional activities and discussions with the Data Collection Team. The Data Collection Team leader will also review the process for submitting deliverables and review the project schedule.

### **5.2.8 Follow-Up Site Visit**

Following review of data obtained during initial collection efforts, a follow-up site visit may be necessary to address any data gaps. Similar to the previous visit, the follow-up site visit would be coordinated with the installation POC.

### **5.2.9 Site Reconnaissance**

To allow for a thorough review of data, the site reconnaissance will be scheduled to occur during a separate mobilization. During the site reconnaissance, suspected MEC and/or MC sites, as identified during data collection efforts, will be visually inspected through a surface walk-over to identify materials and/or surface features that provide information on the areas and activities in question. Areas to be inspected will be mutually agreed upon between Resolution Consultants, the RPM, and the installation POC.

Site reconnaissance activities will be led by a UXO qualified member of the Resolution Consultants Data Collection Team, a Resolutions Consultant munitions subject matter expert, and activity personnel as deemed appropriate by the installation POC. Boundaries will be verified using maps and pin flags placed at each corner and along the boundaries at a minimum spacing of 50 feet. The corners of each site will be located using a handheld Global Positioning System (GPS) unit. The limited visual survey will be designed to encompass a minimum of 10% of the total acreage; however, the actual amount of area surveyed will be dependent on the size and nature of the site being inspected. The site reconnaissance team will walk from one corner to the opposite corner visually inspecting for any indicators of MEC. This will be repeated at the other two corners to form an X pattern. The MEC and/or MC site will then be inspected by walking the approximate center across the length of the site to the other end. This will be repeated through the width of the MEC and/or MC site. After completing this pattern, the search will start again by establishing a search lane approximately 25 feet to the left of centerline at the length of the site, then to the right of centerline. A similar search lane will be established at the centerline of the width of the site. In some cases, the distance between the search lanes may be decreased depending on the vegetation and terrain. The corners of the site, the 25-foot intervals, and the search lanes will be marked with pin flags and flagging. These lanes will then be documented using a handheld GPS unit.

Visible indicators of MEC/MC use as recognized by UXO qualified personnel may include physical depressions, indicative of former open burn and open detonation areas and potential burial trenches and/or pits. Areas that lack vegetation and/or eroded areas with obvious signs of exposed metallic items may indicate the presence of ordnance materials. More obvious signs may include actual UXO items on the surface, fragmentation, craters, bomb and projectile entry holes, vegetation damage, and ordnance-related range residue. If any live and/or suspected live UXO are encountered by UXO qualified personnel during the site reconnaissance, the location of the material will be marked and the activity POC will be immediately notified so that the Navy can take steps to

determine if an immediate response is required. A GPS unit will be used to record coordinates of notable features/observations, and, if permitted, such features will be documented with a digital camera. In addition, a limited handheld magnetometer survey may be performed by UXO qualified personnel for avoidance purposes only.

### **5.3 Data Elements**

Goals of data collection are to obtain sufficient data to develop a Conceptual Site Model (CSM) and prepare the PA report. The following sections list items that must be known or inferred from the available dataset to achieve such goals.

#### **5.3.1 Site Location and History**

The MEC and/or MC site location and history will provide a frame of reference for the PA. Information to be collected includes:

- Site name
- Location of the MEC and/or MC site, including latitude and longitude coordinates
- Site boundaries, including onshore and offshore areas
- Site Status (i.e., closed, transferred or transferring)
- Current and historic uses of the MEC and/or MC site
- Historical features that indicate potential release areas (e.g., landfills or lagoons, ground scars, craters)
- Safety issues related to munitions
- Regulatory status of the site

#### **5.3.2 Physical Setting**

The MEC and/or MC site physical setting will cover factors that may affect release, fate and transport, and potential receptors. Relevant information includes the following:

- Topographic and vegetative features

- Surface water features and drainage pathways
- Surface geology, including soil type and properties
- Meteorological data including temperature, precipitation, humidity, predominant wind direction and wind speed
- Geophysical data
- Hydrogeologic data for depth to groundwater and aquifer characteristics
- Soil boring or monitoring well logs and locations
- Cultural resources
- Biological resources
- Adjacent land use

### **5.3.3 MEC/MC Release Information**

This includes information regarding the types, quantities, constituents, and other factor related to military munitions, and incorporates knowledge about potential hazardous waste contamination. The following information will be obtained and/or computed:

- Specific types of ordnance believed to have been used including dates and durations of use
- Estimated residual density for each ordnance type
- Munitions constituents or filler materials associated with ordnance used on the site
- Other potential contamination as a result of past ordnance use
- Presence of chemical warfare material
- Types of ordnance management practices employed at the site

- Expected penetration depths of ordnance types
- Locations and delineations of confirmed MC and/or hazardous waste contamination with sampling locations (based on existing investigation reports)
- Migration routes and mechanisms to include erosion, re-deposition, and frost heave as well as typical hazardous constituent migration pathways
- Information on previous range clearance activities or remedial actions including sub-surface depths
- Types and locations of any targets that may have been used
- Modeling results

#### **5.3.4 Land Use and Exposure Profile**

Land use information and exposure pathways will be used primarily to develop the CSM. The following information will be collected:

- Land use on and near the MEC and/or MC site
- Anticipated future land use
- Land use restrictions
- Habitat type (e.g., wetland, forested, desert, pond, etc.)
- Beneficial resource classification (e.g., aquifer classification, wetlands, cultural resources)
- Resource use locations (e.g., water supply wells, recreational swimming, boating or fishing areas, hiking trails, etc.)
- Nearby populations types (e.g., schools, hospitals, site workers) and distances from site
- Number and types of buildings and distances from site



- Identification of ecological receptors in relation to habitat type (e.g., endangered or threatened species, migratory animals, fish)
- Locations of utilities on or near the site

## **6.0 DATA REVIEW/ANALYSIS**

### **6.1 Need for Immediate Response**

Intrusive investigation and/or removals are outside the scope of this PA. However, the Data Collection Team may encounter UXO and ordnance-related range residue during the site reconnaissance. In the event that any UXO and/or range residue is encountered, the general area will be marked by UXO qualified personnel using pin flags and located using a GPS unit. The activity POC will be immediately notified so that the Navy can determine the need for an immediate response. Under no circumstances will UXO be handled, moved, or disturbed during the PA process.

For the purposes of the PA, Resolution Consultants will use the following guidelines to determine when a site should be immediately brought to the attention of Navy for immediate action. These triggers include:

- The presence of chemical warfare materiel (CWM) on the surface regardless of MEC and/or MC site accessibility.
- The presence of submunitions on the surface regardless of MEC and/or MC site accessibility.
- The presence of high-explosive-filled UXO on the surface of an accessible area.
- The presence of white-phosphorus-filled UXO on the surface of an accessible area.
- The presence of sensitive fused UXO on the surface of an accessible area.
- Areas of known subsurface UXO where current intrusive activities have the potential of encountering the UXO (e.g., construction site).
- Areas of known surface or subsurface UXO where the site dynamics have the potential for UXO migration (e.g., severe beach erosion).
- Any situation where the onsite UXO technician feels that the explosive hazard on the MEC and/or MC site makes it too dangerous to conduct the MEC and/or MC site reconnaissance.

The primary concern is for site personnel and public safety. If the confirmed presence of MEC on the ground surface or one of the above triggers is present, the team leader will immediately contact the Navy for further guidance regarding the MEC and/or MC site and to present the MEC and/or MC site conditions and the need for an immediate response action. The Navy will make the final response action decision.

## **6.2 UXO Evaluation/Site Characterization**

The following sections outline the data review/analysis process for determining UXO type or site type. To determine the most efficient CERCLA process, areas may be divided depending on their use and the MEC and/or MC identified. Resolution Consultants will coordinate with the Navy RPM in making this decision. Information needed to determine the best approach for grouping sites is presented in the following subsections.

### **6.2.1 UXO Concentrations**

Data collected during the records review and site reconnaissance may be insufficient to estimate the concentration or density of UXO. Therefore, the following four categories and associated UXO density ranges will be used to characterize PA areas:

- High (greater than 40 items per acre)
- Medium (15-39 items per acre)
- Low (3-14 items per acre)
- Very low (1-2 items per acre)

Additionally, two other categories will be used: suspect areas and no evidence areas. Suspect areas contain no direct evidence of MEC; instead, indirect evidence or anecdotal information suggests that MEC may be present. By definition, there is not enough information to determine UXO density. No evidence areas are areas with no records or evidence indicating the presence of a hazard.

### **6.2.2 Site Type**

The type of site evaluated and characterized during the PA will determine specific data collection questions, the potential types of hazards, and the primary release mechanism. Table 6-1 lists site types, their general characteristics, and default density levels based on field experience and knowledge of military ranges, training areas, and activities.

<b>Table 6-1 Site Types and Default Densities</b>		
<b>Area Type</b>	<b>General Characteristics</b>	<b>Default Density</b>
Storage Area/Magazine	Strong potential for MC, munitions burials	Low
Transfer Point	Low potential for MC, munitions burials	Low
Firing Point/Gun Position	Munitions burials	Low
Impact/Target Area	High concentrations of UXO, target materials	High
Range Safety Fan/Buffer Area	Potential for UXO within area, no target materials	Medium
Combat Range	Small arms casings, UXO	Medium
Minefield	Ordnance patterns (mine lanes)	High
Burial Pit/Disposal Trench	Concentrations of UXO	High
Open Burn/Open Detonation	Scattered UXO, demo materials, MC	High
Ordnance Ricochet Area	Scattered UXO	Medium
Bivouac / Encampment Area	Discrete burial locations	Very low

Default densities will be used if site-specific data and records are insufficient to confidently assign a density value to the site. Site type will drive the data analysis and future characterization effort.

### **6.2.3 Ordnance Type and Fillers**

Classifying known or suspected ordnance types is an important factor when determining explosive safety hazard and for overall site assessment. Ordnance will be described in terms of families of ordnance and known or suspected general filler types.

The following ordnance families will be used to classify ordnance:

- Bombs
- Mortars
- Projectiles
- Rockets/Guided Missiles
- Hand Grenades
- Rifle Grenades
- Submunitions
- Underwater Ordnance

Along with the general ordnance family, the types of fillers will be assigned to the following categories:

- Toxic chemical agent (Chocking, nerve, blood, blister) (CWM)
- High explosive (HE)
- White phosphorus (WP)
- Flame or incendiary material (ICN)
- Riot control agents (vomiting, tear) (CS)
- Smoke (other than WP) (SMK)
- Practice (spotting charges) (PRAC)
- Wholly inert (INT)

The Data Collection Team will note if the ordnance category and filler combination is either known/confirmed (K), anticipated (A), or suspected (S) to be at the site.

- Landmines
- Signals/Flares
- Gas Identification Sets (CAIS)
- Small Arms
- Miscellaneous (Demolition materials, detonators, blasting caps, fuses)

#### **6.2.4 Penetration Depth**

Ordnance penetration depth will be analyzed to understand exposure scenarios, potential depth of ordnance, and overall explosive hazard. Ordnance penetration depth depends on the characteristics of the ordnance items and the properties of the impacted soil. The major characteristics that effect penetration depth include weight, shape, material, velocity, and angle of impact. An extensive study offering generalized solutions and procedures for estimating maximum expected penetration depth was performed by the Soils Dynamics Laboratory at the U.S. Army Corps of Engineers Waterways Experiment Station. The results of the study are contained in an Army Technical Manual titled Fundamentals of Protective Design for Conventional Weapons, TM5-855-1. The theory and formulas derived from TM 5-855-1 have been incorporated into a software program, which can estimate the maximum theoretical depth of penetration.

The theories and formulas derived in TM 5-855-1 are not presented here, but the overall results are presented in Table 6-2 below.

<b>Table 6-2 Ordnance Types and Penetration Depths</b>						
<b>Ordnance Type</b>	<b>Approx. Gross Ordnance Weight</b>		<b>Estimated Maximum Ordnance Penetration</b>			
			<b>Sandy Soil</b>		<b>Clayey Soil</b>	
	<b>(lbs)</b>	<b>(kgs)</b>	<b>(FT)</b>	<b>(meters)</b>	<b>(FT)</b>	<b>(meters)</b>
20 mm	.56	.25	1.0	.305	3.0	.914
60 mm	3.52	1.60	1.0	.305	3.0	.914
66 mm	2.35	1.07	2.0	.610	4.5	1.37
37 mm	1.61	.73	2.5	.762	5.0	1.54
40 mm	1.98	.90	2.5	.762	5.0	1.54
2.75 inch	8.90	4.04	3.5	1.07	7.5	2.29
57 mm	5.29	2.04	4.0	1.22	8.5	2.59
4.2 inch	27.07	12.29	4.0	1.29	8.5	2.59
75 mm	10.14	4.60	4.5	1.37	9.5	2.90
105 mm	31.80	14.44	5.5	1.68	11.5	3.50
106 mm RR	17.55	7.97	5.5	1.67	10.5	3.20
3.5 inch	9.00	4.09	5.5	1.67	10.5	3.20
76 mm	14.15	6.42	6.0	1.83	12.0	3.66
3 inch	13.50	6.13	6.0	1.83	12.0	3.66
4.5 inch	42.50	19.30	6.5	1.98	13.0	3.96
90 mm	11.24	5.10	7.0	2.13	13.1	3.96
152 mm	95.92	43.55	7.5	2.28	15.0	4.57
5 inch	70.00	31.78	8.0	2.44	16.5	5.03
155 mm	94.60	42.95	8.5	2.59	16.5	5.03
120 mm	31.20	14.16	9.0	2.74	17.0	5.18

This table will be used to establish probable maximum ordnance penetration depth.

### **6.2.5 Special Attention Ordnance**

Some ordnance items require special consideration or are of specific concern and should be evaluated as a site progresses through the response and/or remedial process. Ordnance items with very high hazard levels, that may cause public relations concerns among regulators and stakeholders, or that are emerging problems at other DoD installations, are considered special attention ordnance. The following are several categories of ordnance requiring special attention and their specific concerns:

- Chemical Warfare Material — (Safety and public relation concern)
- Electrically Fused Ordnance — (Safety concern) Electrically fused ordnance on a range is a safety concern for geophysical survey crews. Certain geophysical instruments generate magnetic and/or electrical fields that can initiate certain electrically fused ordnance. If electrically fused ordnance is suspected at a site, using certain geophysical instruments (e.g., ground penetrating radar) is prohibited. In addition, specific safety precautions are followed with other survey instruments.
- Depleted Uranium Ordnance — (Public relation concern) Depleted Uranium (DU) is perceived by the public as a serious hazard; however, it is generally not as hazardous as it is perceived. DU is used mainly in projectiles to penetrate armored targets. DU is very dense, strong, and hard and is designed to have a pyrophoric effect on armored targets. As a DU round penetrates armor it breaks up into small fragments generating intense heat while DU oxide is dispersed into the atmosphere. The spalling, sparking, and extreme heat is enough to cause fires inside of armored vehicles, thus defeating the target.

In terms of UXO clearance DU is relatively harmless unless ingested or absorbed into bloodstream through open cuts. DU dust does, however, pose an inhalation hazard to UXO workers based on its toxicity rather than its radioactivity. DU found on a range will exhibit the following characteristics:

- Non magnetic
- Extremely heavy (about 50% denser than lead)
- Jet-black lumps or dust (may have a greenish tinge) that eventually turn green
- Honeycomb-like texture
- Yellowish color after years of exposure or oxidized

In many cases, it may not be possible to identify DU areas through visual inspection and normal radiographic instruments are not sensitive enough to detect DU and will not be used in the site walk. Therefore, the potential for DU being present will most likely come from historic records. Examples of ordnance containing DU are included in Table 6-3 below.

<b>Table 6-3 Examples of U.S. Ordnance That Contain Depleted Uranium</b>	
<b>DODIC</b>	<b>Munition Nomenclature</b>
A675	CARTRIDGE, 20 MM LINKED, DS, MK 159-1,
A676	CARTRIDGE, 20 MM LINKED, DS, MK 149-2
A986	CARTRIDGE, 25 MM , APFSDS-T, M919
A983	CARTRIDGE, 25 MM , API, PGU-20/U
B103	CARTRIDGE, 30 MM , API-T/HEI, PGU-14/B & PGU-13/B
C523	CARTRIDGE, 105 MM APFSDS-T M774, W/M13 TRACER
C524	CARTRIDGE, 105 MM , APFSDS-T, M833
C543	CARTRIDGE, 105 MM , APFSDS-T, M900
C786	CARTRIDGE, 120 MM , APFSDS-T, M829
C380	CARTRIDGE, 120 MM , APFSDS-T, M829A1
D501	PROJECTILE, 155 MM APERS, M692, W/O FZ, W/M67 APERS MINES ADAM-L,
D502	PROJECTILE, 155 MM APERS, M692, W/O FZ, W/M67 APERS MINES ADAM-L,
K152	MINE, AP, PDM M86

- Perchlorate-linked munitions — (Public relations concern) Perchlorate is rapidly becoming a leading challenge for DoD and environmental regulators. Most manufactured perchlorate is primarily in the form of ammonium perchlorate, which is a main ingredient in solid propellant. Since 1997, it has been found in soil, groundwater, and even surface water.

As part of the data collection effort, if special attention ordnance is known or suspected to be at the site, it will be highlighted and brought to the **Navy's attention**.

### **6.3 Conceptual Site Model Development**

Developing a CSM is an iterative process that, through continual refinement, reflects the activities at a site from PA through closure. The CSM serves as a planning instrument, a modeling and data interpretation aid, and a communication device by summarizing known information and identifying additional data needs. By identifying sources, potential transport and release mechanisms, pathways of exposure, and potential receptors, the CSM is instrumental in developing an understanding of potential safety hazards and risks to human health and the environment. Specific data elements to be included in the CSM are as follows:

The Facility Profile, which describes all man-made features of the range or site, will contain information such as:

- The type and number of MEC and/or MC sites (including but not limited to firing ranges of all types, maneuver/training areas, bivouac areas, and ordnance disposal or treatment areas).
- The MEC and/or MC site size and boundaries.
- The weapons and ammunition used at the MEC and/or MC site (including but not limited to the use time frame, type, density, condition, filler, and depth of MEC including UXO).
- Types and quantity of MEC encountered during the limited visual survey.
- The orientation and dimensions of the MEC and/or MC site (including, but not limited to, the function of the MEC use over time from both limits of fire and placement of firing points and impact areas).
- The types of MC at each MEC and/or MC site (including the media that contain MC and the concentrations of MC, if available).

The Physical Profile, which describes the environmental setting in which the range or site is located, will contain information such as:

- The geology underlying the MEC and/or MC site including soil types, stratigraphy, and permeability.
- The hydrogeology underlying and in the vicinity of the MEC and/or MC site including depth to groundwater, groundwater flow, confining units, and discharge/recharge areas.
- Hydrology including location, size, and direction of flow of surface water bodies on and in the vicinity of the MEC and/or MC site.
- Meteorology including temperature, precipitation, humidity, predominant wind direction, and wind speed.

- Types of vegetation and percent cover.

The Release Profile, which describes environmental fate and transport mechanisms that may contribute to the movement of MEC or MC, will contain information such as:

- The fate and transport mechanisms that may cause the migration or movement of MEC (i.e., frost heave, erosion, and re-deposition).
- The fate and transport mechanisms that may cause the migration of MC (i.e., percolation through soil to groundwater, dissolution in groundwater or surface water, etc.).
- Information on precipitation and humidity to assess the possibility of munitions rusting or decomposing to release MC.
- Information on vegetative cover to assess the possibility of MC in soil to become suspended in air as a dust due to insufficient vegetative cover.
- Information on types and rates of soil erosion (i.e., wind, wave action, etc.)

The Land Use and Exposure Profile will describe current and reasonable future land use on and in the vicinity of the MEC and/or MC site to identify potential human and ecological receptors. The Land Use and Exposure Profile will contain information such as:

- Change in the location and distribution of MEC including re-deposition of MEC that may occur while excavating soil during construction activities such that MEC that were once deeply buried may become more shallow, frost heave that tends to cause buried MEC to move toward the surface, and soil erosion that also can cause buried MEC to become closer to the surface, all of these may cause MEC to be more accessible for contact.
- In addition to changes in the location of MEC due to frost heave, erosion, and re-distribution, penetration depth may also be affected by soil type, soil moisture, topography, and vegetation.

- Access to MEC and/or MC sites, both currently and under future land use need to be considered. This will include the frequency of receptor use at the MEC and/or MC site and the depth of soil intrusion that the **receptors'** activities will involve.
- For exposure to MC, it is important to consider whether MC have migrated or have the potential to migrate from the MEC and/or MC site. MC may become available for contact by receptors far from the MEC and/or MC site; for instance, MC that have migrated to groundwater which may be used as a potable source in the vicinity of an MEC and/or MC site.

The Ecological Profile will describe actual and potential ecological receptors at and in the vicinity of the MEC and/or MC site. Information obtained during the data collection phase on threatened and endangered species and sensitive communities will contribute to the Ecological Profile.

Based on findings of the data collection, a draft, preliminary CSM will be prepared on behalf of each MEC/MC site. The preliminary CSM will utilize text and graphics to summarize known information for each area, with a focus on the delivery mechanism whereby the suspected MEC was placed in its current location. The CSM for each MEC/MC site will include:

- The types and locations of known or suspected sources of MEC/MC and the expected density, distribution, and concentrations.
- The media where the MEC/MC sources may be found.
- Release mechanisms for transfer of the MEC/MC.
- The exposure media to which the MEC, specifically MC, have migrated.
- The exposure routes whereby the receptors contact the MEC/MC.
- Human and ecological receptors that may come into contact with MEC/MC.

Draft versions of initial CSMs will be submitted for review by the Navy RPM and activity or installation POC, prior to incorporation to the PA report.



## **7.0 DEFENSE SITE PRIORITIZATION**

In accordance with 10 United States Code §2710(b)(1), the Office of the Secretary of Defense, U.S. DoD has established protocol for assigning a relative priority for military munitions response activities at each site. 10 United States Code 2710(b)(2) requires DoD to prioritize actions according to overall site conditions by considering various factors affecting the potential for safety and environmental hazards. Data elements collected during the PA will provide the Navy with sufficient information to develop an initial prioritization scoring for PA sites using the Munitions Response Site Prioritization Protocol (MRSPP). Resolution Consultants will assist the Navy RPM in preparing the MRSPP site prioritization score sheets.

## **8.0 DELIVERABLES**

A PA Report will be prepared to present/summarize data collected and document findings of the data review efforts and site reconnaissance. The report will identify, screen, and describe areas that pose varying levels and types of risks, as well as those that pose little or no risk, to human health and the environment and/or areas that warrant an accelerated response. The screening process will focus on potential MEC hazards, while taking into account the initial CSM. Results of the screening will be used to make recommendations of no further action, additional investigation, and/or immediate action for each area. The PA Report will also identify any data gaps, which could impede future decisions on response actions. Versions of the PA report will include a draft for Navy review and comment, a draft-final report for regulatory review and comment, and a final report. The basic format for the PA report is outlined below (supporting figures and tables will be included, as necessary):

- I. Introduction
  - A. Purpose
  - B. Project drivers
  - C. Project management
  - D. Data collection process
  
- II. Installation Background
  - A. Location/Setting (Include map)
  - B. Brief History
  - C. Munitions related training/storage/usage
  
- III. Physical Characteristics
  - A. Climate
  - B. Topography
  - C. Soil and vegetation types
  - D. Hydrology (groundwater and surface water)
  - E. Cultural and natural resources
  - F. Endangered and special status species

- IV. Summary of Data Collection Efforts
  - A. Archives (offsite)
  - B. Site visit (onsite)
    - 1. Records reviewed
    - 2. Offices visited/interviews
    - 3. Site Reconnaissance
  
- V. MEC and/or MC Site Characteristics (Separate section for each site)
  - A. History and description
  - B. Visual observations
  - C. Munitions and munitions related materials
  - D. MEC presence
  - E. Ordnance penetration estimates
  - F. MC presence
  - G. Contaminant migration routes
  - H. Receptors
  - I. Land use
  - J. Access controls/restrictions
  - K. Conceptual site model
  - L. Findings and recommendations

Appendices:

- A. References
- B. Project Source Data — General
- C. Project Source Data — Site Specific
- D. Ordnance Technical Data Sheet

The PA report, along with other project deliverables, correspondence, and data will be uploaded to the Naval Installation Restoration Information System (NIRIS) web portal. All documentation submittals for NIRIS will be coordinated with the Command Environmental Restoration Records Manager.

## **9.0 QUALITY ASSURANCE/QUALITY CONTROL**

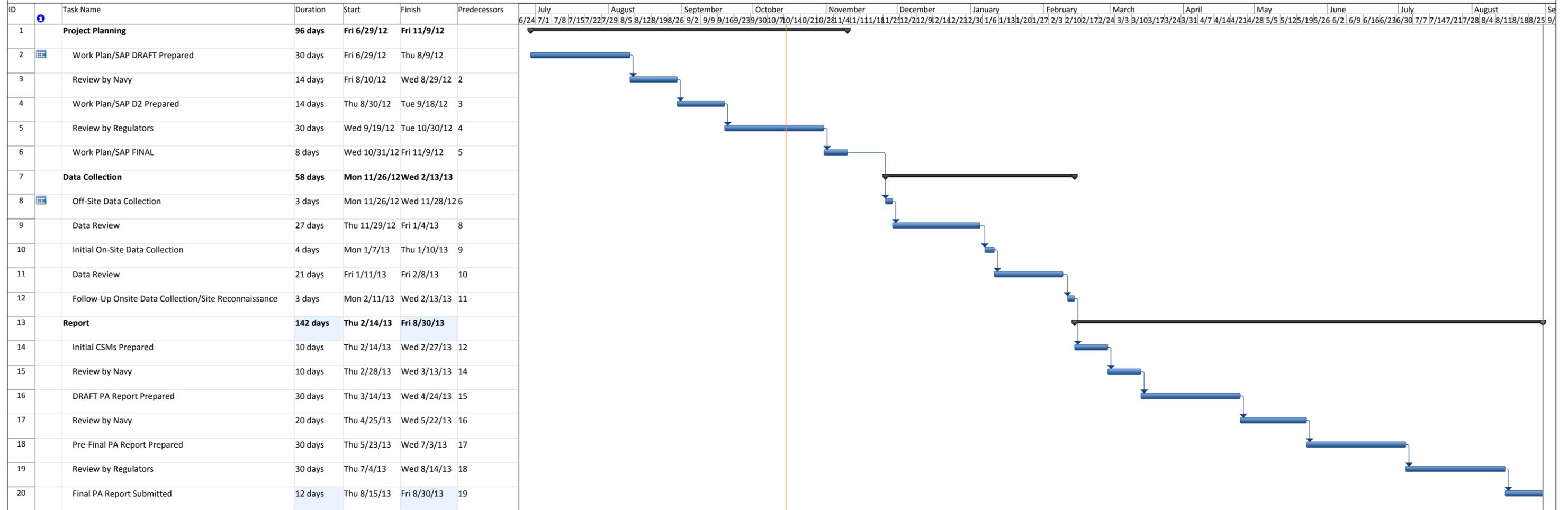
The quality of service and deliverables under this project will be the responsibility of the TOM, while **the overall responsibility for implementation and monitoring the Resolution Consultants' QA Program** resides with the CLEAN Program Management team. Resolution Consultants will comply with the most recent CLEAN Program Management Plan. During execution of the PA, team members will take thorough notes to document files reviewed, the nature of the information found in those files, and the type of information selected for electronic entry or photocopying. Identifying data sources in the notes will also allow the data collection teams and the Navy to assess the reliability of the various sources. Formal interview records will be prepared to ensure that the relevant information is documented in a consistent, thorough manner. Data supplied by interviewees will be validated by comparing interview notes to the information sources found onsite. Data will be reviewed by the TOM and senior technical advisor through an ongoing basis and during internal review of the draft PA report. Additional peer reviews and detail checks will be performed to ensure consistent and accurate results. Munitions subject matter experts will determine if reported MEC and/or MC site areas and boundaries are appropriate for the type of weapons/ordnance reportedly used on the MEC and/or MC site, during that time period. The TOM will ensure that data elements have been adequately collected. Finally, the TOM will ensure that any data discrepancies are corrected before final data delivery to the Navy.



## **10.0 SCHEDULE**

The estimated period of performance for this project is 12 months. The proposed project schedule is included as Figure 10-1. Resolution Consultants will inform the Navy on any delay/changes to the project schedule.

**FIGURE 10-1  
MMRP BASEWIDE PRELIMINARY RANGE ASSESSMENT PROJECT SCHEDULE  
NSB KINGS BAY  
UPDATED 10/15/12**



Project: Project1  
Date: Mon 10/15/12

Task		Summary		External Milestone		Inactive Summary		Manual Summary Rollup		Finish-only	
Split		Project Summary		Inactive Task		Manual Task		Manual Summary		Deadline	
Milestone		External Tasks		Inactive Milestone		Duration-only		Start-only		Progress	



## **11.0 REFERENCES**

27 Code of Federal Regulations (CFR) Part 55, Commerce in Explosives.

American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.

Applicable sections of Department of Transportation, 49 CFR Parts 100 to 199, Transportation.

Applicable sections of EPA, 40 CFR Parts 260 to 299, Protection of Environment.

AR 200-1, Environmental Protection and Enhancement.

AR 385-10, The Army Safety Program.

AR 385-16, System Safety Engineering and Management.

AR 385-40 w/USACE supplement, Accident Reporting and Records.

AR 385-64, Ammunition and Explosives Safety Standards.

ATFP 5400.7, Alcohol Tobacco and Firearms Explosives Laws and Regulations.

CEHNC EM 385-1-1, Safety and Health Requirements Manual.

CEHNC ER 385-1-92, Safety and Occupational Health Document Requirements for Hazardous Waste Remedial Actions.

DA PAM 385-64, Ammunition and Explosives Safety Standards.

DoD 4160.21-M, Defense Reutilization and Marketing Manual.

DoD 6055.9-STD, DoD Ammunition and Explosives Safety Standards.

MPI Safety and Health Program.



NAVSEA OP 3565/NAVAIR 16-1-529, VOL 2, 11<sup>th</sup> Edition, Electromagnetic Hazards.

NAVSEA OP 5, 7<sup>th</sup> Edition, Ammunition and Explosive Safety Ashore Vol. 1.

National Institute of Safety and Health/Occupational Safety and Hazard Administration (OSHA)/United States Coast Guard/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.

OSHA, 29 CFR 1910, General Industry Standards.

OSHA, 29 CFR 1926, Construction Standards.

TM 5-855-1 (For Official Use Only) 1376 CEMP Design & Analysis of Hardened Structures to Conventional Weapons Effects. (1998, August).

TM 60 Series Publications.

TM 9-1300-200, Ammunition General.

TM 9-1300-214, Military Explosives.

Content Standard for Digital Geospatial Metadata (FGDC-STD-001-1998), The Federal Geographic Data Committee, June 1998.

DERP Management Guidance, September 2001.

Guidance Manual and Handbook on the Management of Ordnance and Explosives at Closed, Transferred, and Transferring Ranges. (2001, June).

Malcolm Pirnie. (2003). Final Navy Programmatic Work Plan for Preliminary Assessment on MMRP Ranges and Sites.

Management Principles for Implementing Response Actions at CTT Ranges. (2000, March).



Mil-Hdbk-1027/3b 30 November 1992 Superseding, Military Handbook - Range Facilities And Miscellaneous Training Facilities Other Than Buildings.

Spatial Data Standards for Facilities, Infrastructure, and Environmental version 2.2, CAD/GIS Technology Center. (2002, August).

United States Army Corp of Engineers. (2002). Working Review Draft of the Development of Integrated Conceptual Site Models for Environmental and Ordnance and Explosives Sites.

United States Environmental Protection Agency. (1989). Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA/540/G-89/0004).

**Appendix A**  
**Health and Safety Plan**

**HEALTH AND SAFETY PLAN**  
**MUNITIONS RESPONSE PROGRAM**  
**BASEWIDE PRELIMINARY RANGE ASSESSMENT**  
**NAVAL SUBMARINE BASE (NSB) KINGS BAY, GEORGIA**

**Revision: 0**

**Resolution Consultants Job Number:**  
**0888812553**

**Prepared for:**



**Department of the Navy**  
**Naval Facilities Engineering Command, Atlantic**  
**6506 Hampton Blvd.**  
**Norfolk, Virginia 23508-1278**

**Comprehensive Long-Term Environmental Action Navy**  
**Contract Number N62470-11-D-8013**  
**CTO JM15**

**Prepared by:**



**RESOLUTION  
CONSULTANTS**

**Resolution Consultants**  
*A Joint Venture of AECOM & EnSafe*  
**448 Viking Drive, Suite 145**  
**Virginia Beach, Virginia 23452**

**October 2012**

## **SITE HEALTH AND SAFETY PLAN**

This Health and Safety Plan (HASP) was prepared for employees performing a specific, limited scope of work. It was prepared based on the best available information regarding the physical and chemical hazards known or suspected to be present on the project site. While it is not possible to discover, evaluate, and protect in advance against all possible hazards that may be encountered during the completion of this project, adherence to the requirements of the HASP will significantly reduce the potential for occupational injury. By signing below, I acknowledge that I have reviewed and hereby approve the HASP for Naval Submarine Base (NSB) Kings Bay. This HASP has been written for the exclusive use of Resolution Consultants' employees and subcontractors. The HASP is written for specified site conditions, dates, and personnel, and must be amended if these conditions change.

### **Prepared by:**

\_\_\_\_\_  
Eric Allen  
Health and Safety Specialist  
(901) 937-4281

\_\_\_\_\_  
October 2012

Date

### **Review by:**

\_\_\_\_\_  
Steve Skipper  
Health and Safety Program Manager  
(904) 367-4324

\_\_\_\_\_  
October 2012

Date

### **Concurrence by:**

\_\_\_\_\_  
David Warren  
Project Manager  
(843) 884-0029

\_\_\_\_\_  
October 2012

Date

## EXECUTIVE SUMMARY

The purpose of this Health and Safety Plan (HASP) is to address health and safety concerns related to Resolution Consultants managed activities at Naval Submarine Base (NSB) Kings Bay, Georgia. The specific roles, responsibilities, authority, and requirements as they pertain to the safety of employees and the scope of services are discussed herein. The document is intended to identify known potential hazards, and facilitate communication and control measures to prevent injury or harm. Additionally, provisions to control the potential for environmental impact from these activities are included where applicable.

<b>SUMMARY TABLE</b>					
Resolution Consultants SOW		Resolution Consultants will locate and review onsite records and perform a site reconnaissance, limited to a visual survey, for suspected Military Munitions Response Program (MMRP) sites and/or ranges.			
<b>PRIMARY PHYSICAL HAZARDS</b>					
	Underground Utilities	x	Traffic Control		Electrical Hazards
	Overhead Utilities	x	Slips, Trips/Walking Surface		Hand & Power Tools
	Drilling and Boring		Manual Lifting	x	Wildlife, Plants & Insects
	DPT Rig Operations		Water, Working Around	x	Heat Stress
<b>CHEMICAL HAZARDS, MONITORING, ACTION LEVELS</b>					
<b>COC</b>		<b>Monitoring</b>		<b>Action Levels</b>	

All staff are bound by provisions of this HASP and are required to participate in a preliminary project safety meeting to familiarize them with the anticipated hazards and respective onsite controls. The preliminary safety meeting should cover the entire HASP subject matter, putting emphasis on critical elements of the plan, such as the emergency response procedures, personal protective equipment, site control strategies, and monitoring requirements. In addition, daily tailgate safety meetings will be held to discuss: the anticipated scope of work, required controls, any new hazards and associated controls, incident reporting protocol, results of any inspections, and any lessons learned or concerns from the previous day.

## Table of Contents

SITE HEALTH AND SAFETY PLAN .....	i
EXECUTIVE SUMMARY.....	ii
ACRONYM LIST.....	vi
1.0 INTRODUCTION.....	1-1
1.1 General.....	1-1
1.2 Project Policy Statement.....	1-1
1.3 References.....	1-2
2.0 SITE INFORMATION AND SCOPE OF WORK.....	2-1
2.1 Site Information .....	2-1
2.1.1 General Description.....	2-1
2.1.2 Site Background/History .....	2-1
2.2 Objective/Scope of Work.....	2-3
2.2.1 Mobilization/Demobilization.....	2-3
2.2.2 Site Reconnaissance.....	2-3
2.2.3 Additional Work Operations .....	2-4
3.0 HAZARD ASSESSMENT (SAFETY) .....	3-1
3.1 Physical Hazards.....	3-1
3.1.1 Slips, Trips, Falls, and Protruding Objects.....	3-1
3.1.2 Vehicle Operations .....	3-1
3.2 Biological Hazards.....	3-2
3.2.1 Small Mammals .....	3-2
3.2.2 Venomous Animals.....	3-2
3.2.3 Poisonous Plants.....	3-2
3.2.4 Insects.....	3-3
3.3 Ultraviolet Hazards .....	3-4
3.4 Weather Hazards.....	3-4
3.5 Hazard Analysis .....	3-5
3.6 Task Specific Safety, Health, & Environment Procedures .....	3-5
4.0 SH&E REQUIREMENTS (SAFETY) .....	4-1
4.1 Site-Specific Safety Training .....	4-1
4.2 Tailgate Meetings .....	4-1
4.3 Hazard Communication .....	4-1
4.4 General Safety Rules.....	4-1
4.5 Smoking, Eating, or Drinking .....	4-1
4.6 Water Supply .....	4-2
4.7 Stop Work Authority .....	4-2
4.8 Client Specific Safety Requirements.....	4-2
4.9 Heat and Cold Stress .....	4-3

5.0	ENVIRONMENTAL PROGRAM (ENVIRONMENT) .....	5-1
6.0	PERSONAL PROTECTIVE EQUIPMENT .....	6-1
7.0	PROJECT HEALTH AND SAFETY ORGANIZATION .....	7-1
7.1	Task Order Manager [ <i>David Warren</i> ] .....	7-1
7.2	Site Supervisor [ <i>Kara Wimble</i> ] .....	7-1
	7.2.1 Responsibilities .....	7-1
	7.2.2 Authority .....	7-1
	7.2.3 Qualifications .....	7-2
7.3	Site Safety Officer [ <i>Kara Wimble</i> ] .....	7-2
	7.3.1 Responsibilities .....	7-2
	7.3.2 Authority .....	7-3
	7.3.3 Qualifications .....	7-3
7.4	Employees .....	7-3
	7.4.1 Employee Responsibilities .....	7-3
	7.4.2 Employee Authority .....	7-4
7.5	Resolution Consultants Health and Safety Program Manager [ <i>Steve Skipper, CIH, CSP, CHMM</i> ] .....	7-4
7.6	Visitors .....	7-4
8.0	EMERGENCY RESPONSE PLANNING .....	8-1
8.1	Emergency Action Plan .....	8-1
	8.1.1 Emergency Coordinator .....	8-1
	8.1.2 Site-Specific Emergency Procedures .....	8-2
	8.1.3 Safety Accident/Incident Reporting .....	8-3
9.0	PERSONNEL ACKNOWLEDGEMENT .....	9-1

### **Figures**

Figure 8-1	Emergency Occupational Hospital Route/Detail Map .....	8-4
------------	--------------------------------------------------------	-----

### **Tables**

Table 3-1	Hazardous Plant Identification Guide .....	3-3
Table 3-2	Applicable SOPs .....	3-6
Table 4-1	Identification and Treatment of Heat-Related Illness .....	4-3
Table 6-1	Personal Protective Equipment .....	6-1
Table 8-1	Emergency Coordinators/Key Personnel .....	8-2
Table 8-2	Emergency Planning .....	8-3

## **Attachments**

Attachment A Revision Log  
Attachment B Applicable Standard Operating Procedures  
Attachment C Task Hazard Analysis

## Acronym List

ANSI	American National Standards Institute
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
COC	Contaminant of Concern
CSP	Certified Safety Professional
EAP	Emergency Action Plan
EC	Emergency Coordinator
MSDS	Material Safety Data Sheet
PM	Project Manager
PPE	Personal Protective Equipment
SH&E	Safety, Health, and Environmental
SOP	Standard Operating Procedure
SOW	Statement of Work
HASP	Site Health and Safety Plan
SSO	Site Safety Officer
THA	Task Hazard Analysis

## **1.0 INTRODUCTION**

This Health and Safety Plan (HASP) provides a general description of the levels of personal protection and safe operating guidelines expected of each employee or subcontractor associated with project-specific activities being conducted at Naval Submarine Base (NSB) Kings Bay, Georgia. Furthermore, this HASP identifies chemical and physical hazards known to be associated with the Resolution Consultants'-managed activities. The HASP will be supplemented, as necessary, to address any additional activities or changes in site conditions. All such changes must be approved by the Resolution Consultants Health and Safety Program Manager or designee, and will be documented in the Revision Log (Attachment A).

### **1.1 General**

Provisions of this HASP are mandatory for all Resolution Consultants personnel engaged in fieldwork associated with the project-specific environmental services. A copy of this HASP, any applicable addendums, **and the Resolution Consultants' Safety, Health, and Environmental (SH&E) Procedures and Programmatic HASP (2011, October 11)**, shall be accessible onsite and available for review at all times. Recordkeeping will be maintained in accordance with this HASP and the applicable Standard Operating Procedures (SOPs), included in Attachment B. In the event of a conflict between this project-specific HASP, the Programmatic HASP, and/or federal, provincial, state, and local regulations, workers shall follow the most stringent/protective requirements. Concurrence with the provisions of this HASP is mandatory for all personnel and must be acknowledged via signature in Section 9.0.

### **1.2 Project Policy Statement**

Resolution Consultants is committed to protecting the safety and health of our employees and meeting our obligations with respect to the protection of others affected by our activities. We are also committed to protecting and preserving the natural environment and communities in which we operate. The safety of persons and property is of vital importance to the success of this project and accident prevention measures shall be taken toward the avoidance of needless waste and loss. It shall be the policy of this project that all operations be conducted safely.

Onsite supervisors are responsible for those they supervise by maintaining a safe and healthy working environment in their areas of responsibility, and by fairly and uniformly enforcing safety and health rules and requirements for all project personnel.



Subcontractors shall comply with the requirements of this HASP, provisions contained within the contract document, and all applicable rules, requirements, health and safety, and environmental regulations. All practical measures shall be taken to promote safety and maintain a safe place to work. Subcontractors are wholly responsible for the prevention of accidents on work under their direction and shall be responsible for thorough safety and loss control programs and the execution of their own safety plans for the protection of workers.

### **1.3 References**

This HASP conforms to the regulatory requirements and guidelines established in the following documents:

- Title 29, Part 1910 of the Code of Federal Regulations (29 CFR 1910), *Occupational Safety and Health Standards* (with special attention to Section 120, *Hazardous Waste Operations and Emergency Response*).
- 29 CFR 1926, *Safety and Health Regulations for Construction*.
- National Institute for Occupational Safety and Health/Occupational Safety and Health Administration/U.S. Coast Guard/US Environmental Protection Agency, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, Publication No. 85-115, 1985.
- Resolution Consultants, *Programmatic HASP* (2011, October 11)

## **2.0 SITE INFORMATION AND SCOPE OF WORK**

Resolution Consultants will conduct environmental services at NSB Kings Bay in accordance with the applicable Navy Statement of Work (SOW) and associated project-specific work plan documents. Deviations from the SOW and/or work plan will require that the Resolution Consultants' Health and Safety Program Manager or designee review and revise this HASP to ensure adequate protection. All such changes must be documented in Attachment A.

The following is a summary of relevant data concerning the project and the work to be performed. The project-specific work plan serves as a companion document to this HASP and provides additional detail concerning both site history and planned activities.

### **2.1 Site Information**

#### **2.1.1 General Description**

NSB Kings Bay serves as a support base for the Navy's submarine fleet. The base encompasses several thousand acres, on which Resolution Consultants will be conducting a Basewide Preliminary Assessment (PA) for Military Munitions Response Program (MMRP) ranges and sites. MMRP ranges and sites are defined as other than operational ranges, including closed, transferred and transferring ranges and sites that contain unexploded ordnance (UXO), munitions and explosives of concern (MEC) and/or munitions constituent (MC), and/or discarded military munitions.

#### **2.1.2 Site Background/History**

The following history was borrowed from the public NSB Kings Bay website (<http://www.cnic.navy.mil/kingsbay/About/History/index.htm>).

*The chain of events that led to today's combination of high-tempo submarine operations at Kings Bay and the complex construction project that reshaped the face of thousands of acres of land began in 1975. At the time, treaty negotiations between Spain and the United States were in progress. A proposed change to our base agreement with Spain was the withdrawal of the fleet ballistic-missile submarine squadron, Submarine Squadron 16, from its operational base at Rota, Spain. Anticipating this would take place, the Chief of Naval Operations ordered studies to select a new refit site on the East Coast. In January 1976, negotiators initialed a draft treaty between Spain and the U.S.; it called for withdrawal of the squadron from Rota by July 1979. The U.S. Congress ratified the treaty in June 1976.*

*A site-selection steering group evaluated more than 60 sites along the Atlantic and Gulf coasts. By summer of 1976, the number of sites was narrowed to five: Narragansett Bay, RI; Cheatham Annex, VA; Charleston, SC; Kings Bay, GA; and, Mosquito Lagoon, FL.*

*A comprehensive study evaluated each site against a number of criteria, including: costs, ability to meet required schedule, land availability to meet explosive safety requirements, operational capabilities, and logistics consideration, environmental impact and growth potential for future requirements. After careful review, the Navy selected Kings Bay.*

*The first Navy personnel arrived in the Kings Bay area in January 1978 and started preparations for the orderly transfer of property from the Army to the Navy. Naval Submarine Support Base Kings Bay was established in a developmental status July 1, 1978.*

*The base, now Naval Submarine Base Kings Bay, occupies the entire former Army terminal, as well as several thousand additional acres. Preparations for the arrival of the submarine squadron went forward in haste throughout the remainder of 1978 and into 1979. Commander, Submarine Squadron 16 greeted the submarine tender USS Simon Lake (AS-33), when it arrived at Kings Bay on July 2, 1979. Four days later, USS James Monroe (SSBN 622) entered Kings Bay and moored alongside Simon Lake to begin a routine refit in preparation for another deterrent patrol. Kings Bay has been an operating submarine base since that day.*

*In May 1979, the Navy selected Kings Bay as the preferred East Coast site for the Ohio-class submarine. On October 23, 1980, after a one-year environmental impact study was completed and with Congressional approval, the Secretary of the Navy announced Kings Bay as the future home of the new Trident submarine. The building project included the construction of three major commands: Trident Training Facility (TTF), Trident Refit Facility (TRF) and Strategic Weapons Facility, Atlantic (SWFLANT).*

*On January 15, 1989, the first Trident submarine, USS Tennessee (SSBN 734), arrived at Kings Bay. The commissioning of USS Louisiana (SSBN 742) in September 1997 gave Kings Bay its full complement of 10 Trident submarines.*

*The enormous effort put forth by all the commands at Kings Bay reached fruition in late March 1990, when the Trident II (D-5) missile made its first deterrent patrol on board Tennessee.*

*The end of the Cold War and the reorganization of military forces in the 1990s affected Kings Bay. A nuclear policy review recommended the Navy reduce the Ohio-class fleet ballistic-missile submarines from 18 to 14 by 2005.*

*In order to meet the review recommendation, the four oldest Ohio-class submarines were decommissioned and converted to guided missile (SSGN) platforms. Pennsylvania, Kentucky, Nebraska, Maine, and Louisiana shifted homeport to Naval Base Kitsap, WA, as part of balancing the Trident fleet.*

*USS Florida (SSGN 728) arrived at Kings Bay in May 2006 and the USS Georgia (SSGN 729) in 2007.*

## **2.2 Objective/Scope of Work**

The objective of the PA is to determine if MEC and/or MC sites pose threats to human health or the environment, and if so, identify if the nature of the threat is from explosive hazard, MC contamination, or both, and then set priorities for further investigation, as deemed necessary. Furthermore, the PA is intended to provide information necessary to eliminate from further consideration those areas that pose no threat to public health or the environment; differentiate MEC and/or MC sites that may not require further action from MEC and/or MC sites that will require further investigation and/or response action; and determine if an imminent hazard is present, thus requiring an accelerated response. The SOW for this PA consists of the collection and review of historical records, supplemental data collection, and visual observations made during a follow-up site reconnaissance, if warranted, and associated reporting.

### **2.2.1 Mobilization/Demobilization**

Mobilization and demobilization represent limited pre and post-task activities. These activities include driving to and from the site, initial site preparations, and post-work activities.

### **2.2.2 Site Reconnaissance**

Intrusive investigation and/or removals of munitions are outside the scope of the PA. However, field staff may encounter UXO and ordnance-related range residue during the site reconnaissance portion of the work. In the event that any UXO and/or range residue is encountered, the general area will be marked by UXO qualified personnel using pin flags and located using a Global Positioning System unit. The activity Point of Contact will be immediately notified so that the Navy can determine the need for an immediate response. Under no circumstances will UXO be handled, moved, or disturbed during the PA process.



### **2.2.3 Additional Work Operations**

Before performing any task not covered in this HASP, a Task Hazard Analysis (THA) must be developed (at a minimum) and approved by the Resolution Consultants Health and Safety Program Manager or designee.

### **3.0 HAZARD ASSESSMENT (SAFETY)**

#### **3.1 Physical Hazards**

Based on the SOW, the following generic physical hazards may be present at jobsites of this nature. Any additional hazards identified should be included on subsequent THAs to be developed for individual tasks.

##### **3.1.1 Slips, Trips, Falls, and Protruding Objects**

A variety of conditions may exist that may result in injury from slips, trips, falls, and protruding objects. Slips and trips may occur as a result of wet, slippery, or uneven walking surfaces. To prevent injuries from slips and trips, always keep work areas clean, keep walkways free of objects and debris, and report/clean up liquid spills. Protruding objects are any object that extends into the path of travel or working area that may cause injury when contacted by personnel. Always be aware of protruding objects and when feasible remove or label the protruding object with an appropriate warning.

##### **3.1.2 Vehicle Operations**

Vehicles can present serious hazards for site personnel. Blind spots, failure to yield, and other situations may cause heavy equipment/vehicles to come into contact with personnel. To reduce the possibility of contact between equipment/traffic and personnel, always adhere to the following:

- Wear a high visibility reflective safety vest at all times when working near vehicle traffic.
- Always yield to vehicle traffic and stay as far as possible from all vehicle traffic.
- Always maintain eye contact with operators.
- Ensure reverse warning alarms are working and louder than surrounding noise levels.
- Ensure Daily Equipment Safety Inspections are being performed and documentation filed at the site.

For additional requirements, refer to the *Programmatic HASP* (Resolution Consultants, 2011, October 11).

## **3.2 Biological Hazards**

It is anticipated that numerous biological hazards may be present. Poisonous plants may be found along the tree lines, and adjacent to monitoring wells, along with ticks and other biting insects. Stinging insects, such as bees and wasps may build nests within proximity of the work zone. Below is a discussion of the most common biological hazards found on project sites.

### **3.2.1 Small Mammals**

Working in the field either directly or indirectly with small mammals has inherent risks of injury or exposure to zoonotic diseases (infectious diseases that can be transmitted from animals to humans) that all field staff needs to protect themselves against. The risks are usually higher when there is direct contact with a wild animal, either through a break in the skin (blood), saliva, or excrement; however, there are also risks through air-borne diseases (e.g., Hantavirus).

### **3.2.2 Venomous Animals**

Some animals have the ability to inject venom. These include rattlesnakes, black widow spiders, and scorpions. These all have limited distributions, so in most areas you are unlikely to encounter them. Other spiders possess venom but they are not harmful to humans. Shrews have poisonous saliva but the chance of being envenomed by them is extremely unlikely unless they are handled. If bitten by any of these animals special care should be taken to treat the wound as it may lead to complications due to the toxin.

A bite from a venomous snake, which may inject varying degrees of toxic venom, is rarely fatal but should always be considered a medical emergency.

### **3.2.3 Poisonous Plants**

Sensitivity to toxins generated by plants, insects, and animals varies according to dosage and the ability of the victim to process the toxin; therefore, it is difficult to predict whether a reaction will occur or how severe the reaction will be. Staff should be aware that there are a large number of organisms capable of causing serious irritations and allergic reactions. Some reactions will only erupt if a secondary exposure to sunlight occurs. Depending on the severity of the reaction, the result can result in severe scarring, blindness or even death.

Plants that field staff should recognize and take precautions to avoid include: Poison Sumac, Poison Ivy (terrestrial and climbing), Poison Oak, Giant Hogweed (or Giant Cow Parsnip), Wild Parsnip, Devil’s Club, and Stinging Nettle. Many others are extremely poisonous to eat (e.g., Poison Hemlock, Water Parsnip) — do not eat anything that has not been identified.

A large number of plants are not harmful to touch but may contain poisonous berries or foliage that could cause serious complications or death if they are ingested. It goes without saying not to eat any berries or plants that you are not absolutely sure of their identity. Examples of common poisonous or irritating plant species common to the United States are shown in Table 3-1.

<b>Table 3-1 Hazardous Plant Identification Guide</b>	
<p><b>Poison Ivy</b></p> <ul style="list-style-type: none"> <li>• Grows in West, Midwest, Texas, East</li> <li>• Several forms — vine, trailing shrub, or shrub</li> <li>• Three leaflets (can vary 3-9)</li> <li>• Leaves green in summer, red in fall</li> <li>• Yellow or green flowers</li> <li>• White berries</li> </ul>	
<p><b>Poison Oak</b></p> <ul style="list-style-type: none"> <li>• Grows in the East (NJ to Texas), Pacific Coast</li> <li>• 6-foot tall shrubs or long vines</li> <li>• Oak-like leaves, clusters of three</li> <li>• Yellow berries</li> </ul>	

### 3.2.4 Insects

Insects for which precautionary measures should be taken include mosquitoes (potential carriers of disease aside from dermatitis), black flies, wasps, bees, ticks, and the European Fire Ant. Wasps and bees will cause a painful sting if they are harassed. They are of most concern for individuals with allergic reactions who can go into anaphylactic shock. If an individual is exposed to multiple stings, this can cause a serious health concern. These insects are most likely to sting when their hive or nest is threatened.

Ticks can be encountered when walking in tall grass or shrubs. They crawl up clothing searching for exposed skin where they will insert mouthparts to drink blood. Most serious concern is possibility of contracting Lyme disease, which is spread by the Blacklegged or Deer Tick. Occasionally a tick can cause Tick Paralysis if it is able to remain feeding for several days. Full recovery usually occurs shortly after the tick is removed.

The European Fire Ant is often very abundant where it is established. It is very aggressive and commonly climbs up clothing and stings unprovoked when it comes into contact with skin. Painful irritations will persist for an hour or more.

### **3.3 Ultraviolet Hazards**

The 2010 historical UV Index for NSB Kings Bay shows **that worker's UV exposures were in the Extremely High category beginning in May and lasting until September, with worker's exposures in the update Extremely High category from August through September.** Workers performing fieldwork outdoors may be susceptible to sunburn if not properly protected with sunscreen or protective clothing and hats. Skin can burn in minutes when the UV Index is Extremely HIGH. Protective measures are advised.

### **3.4 Weather Hazards**

The Site Safety Officer (SSO) will acquire daily weather forecasts for the project area each morning. Predicted weather conditions of potential field impact are to be included in safety briefings and the THA for that day. Weather changes require a review and update to the THA. Weather-related hazards will directly correlate to the type of weather involved. Hot, dry weather may cause greater dust emissions, particularly during intrusive activities. Rain may increase slip/trip hazards, particularly for ground workers.

Severe weather can occur with little warning. Employees will be vigilant for the potentials for storms, lightning, high winds, and flash flood events. Lightning strikes during electrical storms are also a potential hazard. The following procedures will be implemented once thunder is heard or lightning observed:

- 1) If thunder is heard, all site personnel are to be alert of any visible lightning flashes. The SSO will observe the storm front and track the direction it is moving. The SSO will continue to observe the storm front until it passes or until the prevailing direction is determined to be away from the site.

- 2) If lightning is observed, the Site Supervisor or SSO are to be notified. When the next lightning flash is observed, a “second” count shall be initiated from the time the lightning is observed until the thunder from the strike is heard.
  
- 3) The following action guidelines shall be implemented once the “second” count is  $\leq 30$  seconds:
  - a) “second” count  $> 30$ , the Site Supervisor or SSO will continually observe the storm front. If the front is moving away, work will continue. If the front is moving towards the site, the SS will initially place workers on alert for potential evacuation.
  
  - b) “second” count  $\leq 30$ , the Site Supervisor will issue the evacuation command and all workers are to report to the break/lunch trailer. Work can be re-initiated once the front has passed by and thunder has not been heard for 30 minutes.
  
- 4) If lightning is observed and the storm front is moving away from or around the site and is  $> 20$  miles away, work will be permitted to continue. The location of the storm can be confirmed via internet access to a local weather website that has a Doppler radar tracking system.

### **3.5 Hazard Analysis**

A project-specific THA, based on the current SOW, is included in Attachment C. As a result of unanticipated work activities or changing conditions, the development of additional THAs may be required. Any additional THAs will be reviewed and approved by the Resolution Consultants’ Health and Safety Manager or designee.

### **3.6 Task Specific Safety, Health, & Environment Procedures**

Personnel may be exposed to a variety of chemical, physical, and radiological hazards resulting from project-specific activities. The controls for many of these hazards are discussed in SOPs found in the 300 to 500 Series of the Resolution Consultants Safety, Health, & Environment (SH&E), included as part of the Programmatic HASP. Copies of SOPs applicable to this project are listed in Table 3-2 and included in Attachment B of this HASP.



<b>Table 3-2 Applicable SOPs</b>							
<b>SOP#</b>		<b>Title</b>		<b>SOP#</b>		<b>Title</b>	
S3NA 300 Series — Field (Common)				S3NA 500 Series — Industrial Hygiene			
<input type="checkbox"/>	S3NA-301-PR	Confined Spaces		<input type="checkbox"/>	S3NA-501-PR	Asbestos	
<input type="checkbox"/>	S3NA-302-PR	Electrical, General		<input type="checkbox"/>	S3NA-502-PR	Benzene	
<input type="checkbox"/>	S3NA-303-PR	Excavation and Trenching		<input type="checkbox"/>	S3NA-503-PR	Blood borne Pathogen Program	
<input type="checkbox"/>	S3NA-304-PR	Fall Protection		<input type="checkbox"/>	S3NA-504-PR	Cadmium	
<input type="checkbox"/>	S3NA-305-PR	Hand and Power Tools		<input type="checkbox"/>	S3NA-505-PR	Cold Stress Prevention	
<input type="checkbox"/>	S3NA-306-PR	Highway and Road Work		<input type="checkbox"/>	S3NA-506-PR	Compressed Gases	
<input type="checkbox"/>	S3NA-307-PR	Housekeeping, Worksite		<input type="checkbox"/>	S3NA-507-PR	Hazardous Materials Communication/ WHMIS	
<input checked="" type="checkbox"/>	S3NA-308-PR	Manual Lifting, Field		<input type="checkbox"/>	S3NA-508-PR	Hazardous Materials Handling and Shipping	
<input checked="" type="checkbox"/>	S3NA-309-PR	Mobile or Heavy Equipment		<input type="checkbox"/>	S3NA-509-PR	Hazardous Waste Operations and Emergency Response Activities	
<input type="checkbox"/>	S3NA-310-PR	Rigging, Hoisting, Cranes and Lifting Devices		<input type="checkbox"/>	S3NA-510-PR	Hearing Conservation Program	
<input type="checkbox"/>	S3NA-311-PR	Scaffolding		<input checked="" type="checkbox"/>	S3NA-511-PR	Heat Stress Prevention	
<input type="checkbox"/>	S3NA-312-PR	Ladders and Stairways		<input type="checkbox"/>	S3NA-512-PR	Laboratory Safety	
<input checked="" type="checkbox"/>	S3NA-313-PR	Wildlife, Plants and Insects		<input type="checkbox"/>	S3NA-513-PR	Lead	
<input type="checkbox"/>	S3NA-314-PR	Working Alone & Remote Travel		<input type="checkbox"/>	S3NA-514-PR	Munitions and Explosives of Concern/ Unexploded Ordnance (MEC-UXO)	
<input type="checkbox"/>	S3NA-315-PR	Water, Working Around		<input type="checkbox"/>	S3NA-515-PR	Nanotechnology	
S3NA 400 Series — Field (Uncommon)				<input type="checkbox"/>	S3NA-516-PR	Radiation Safety Programs	
<input type="checkbox"/>	S3NA-401-PR	Aircraft Charters		<input type="checkbox"/>	S3NA-517-PR	Radiation, Non-Ionizing	
<input type="checkbox"/>	S3NA-402-PR	All-Terrain Vehicles (ATVs)		<input type="checkbox"/>	S3NA-518-PR	Radiation, Gauge Source program	
<input type="checkbox"/>	S3NA-403-PR	Avalanches		<input type="checkbox"/>	S3NA-519-PR	Respiratory Protection Program	
<input type="checkbox"/>	S4NA(US)-404-PR	Commercial Motor Vehicles		<input type="checkbox"/>	S3NA-520-PR	Spill Response, Incidental	
<input type="checkbox"/>	S3NA-405-PR	Drilling and Boring					
<input type="checkbox"/>	S3NA-406-PR	Electrical Lines, Overhead					
<input type="checkbox"/>	S3NA-407-PR	Electro-fishing					
<input type="checkbox"/>	S3NA-408-PR	Elevated Work Platforms and Aerial Lifts					
<input type="checkbox"/>	S3NA-409-PR	Forklifts (operation of)					
<input type="checkbox"/>	S3NA-410-PR	Hazardous Energy Control					
<input type="checkbox"/>	S3NA-411-PR	Machine Guarding					
<input type="checkbox"/>	S3NA-412-PR	Powder-Actuated Tools					
<input type="checkbox"/>	S4NA(US)-413-PR1	Process Safety Management					
<input type="checkbox"/>	S4NA(US)-414-PR	Railway Sites					
<input type="checkbox"/>	S4NA(US)-415-PR	RCRA Regulated Facilities					
<input type="checkbox"/>	S3NA-416-PR	Tunnel and Underground Work					
<input type="checkbox"/>	S3NA-417-PR	Utilities, Underground					
<input type="checkbox"/>	S3NA-418-PR	Welding, Cutting and Other Hot Work					
<input type="checkbox"/>	S3NA-419-PR	Water, Marine Operations, Boating					
<input type="checkbox"/>	S3-NA420-PR	Water, Underwater Diving					

## **4.0 SH&E REQUIREMENTS (SAFETY)**

### **4.1 Site-Specific Safety Training**

Resolution Consultants personnel performing onsite activities will be trained in accordance with the Programmatic HASP. Personnel are required to remain current in all of their required training and evaluate their need for additional training when there is a change in work. In addition to the general health and safety training programs, personnel will be required to complete any supplemental training necessary for the specific tasks to be performed. Administration and compliance with the requirements for additional task-specific training will be the responsibility of the site supervisor. Additional training will be documented in the project files.

### **4.2 Tailgate Meetings**

Prior to the commencement of daily project activities, a tailgate meeting will be conducted by the SSO to review the specific requirements of this HASP and applicable THAs. Attendance at the daily tailgate meeting is mandatory for all employees covered by this HASP and must be documented on the attendance form. All safety training documentation is to be maintained in the project file by the SSO.

### **4.3 Hazard Communication**

Hazardous materials that may be encountered as existing onsite environmental or physical/health contaminants during the work activities are addressed in this HASP. In addition, any employee intending to bring any hazardous material onto this Resolution Consultants' controlled work site **must first provide a copy of the item's Material Safety Data Sheet (MSDS) to the SSO for** review and filing. The SSO will maintain copies of all MSDS onsite. MSDS may not be available for locally obtained products, in which case some alternate form of product hazard documentation will be acceptable in accordance with requirements as described in the Programmatic HASP.

### **4.4 General Safety Rules**

All site personnel shall conduct themselves in a safe manner and maintain a working environment that is free of additional hazards, in adherence to the Programmatic HASP.

### **4.5 Smoking, Eating, or Drinking**

Smoking, eating and drinking is not permitted inside any controlled work area at any time. Field workers will wash hands and face immediately after leaving controlled work areas (and always prior to eating or drinking). Consumption of alcoholic beverages is prohibited at any Resolution Consultants' jobsite. Smoking, eating or drinking must be in an approved area.

#### **4.6 Water Supply**

A water supply meeting the following requirements will be utilized:

- *Potable Water* — An adequate supply of potable water will be available for field personnel consumption. Potable water can be provided in the form of water bottles, canteens, water coolers, or drinking fountains. Where drinking fountains are not available, individual-use cups will be provided as well as adequate disposal containers. Potable water containers will be properly identified in order to distinguish them from non-potable water sources.
- *Non-Potable Water* — Non-potable water may be used for hand washing and cleaning activities. Non-potable water will not be used for drinking purposes. All containers of non-potable water will be marked with a label stating:

***Non-Potable Water  
Not Intended for Drinking Water Consumption***

#### **4.7 Stop Work Authority**

All employees have the right and duty to stop work when conditions are unsafe and to assist in correcting these conditions as outlined in the Programmatic HASP. Whenever the SSO determines that workplace conditions present an uncontrolled risk of injury or illness to employees, immediate resolution with the appropriate supervisor shall be sought. Should the supervisor be unable or unwilling to correct the unsafe conditions, the SSO is authorized and required to stop work, which shall be immediately binding on all affected Resolution Consultants employees.

Upon issuing the stop work order, the SSO shall implement corrective actions so that operations may be safely resumed. Resumption of safe operations is the primary objective; however, operations shall not resume until the Resolution Consultants' Health and Safety Manager or designee has concurred that workplace conditions meet acceptable safety standards.

#### **4.8 Client Specific Safety Requirements**

The client has specified no additional health and safety requirements at this time.

## 4.9 Heat and Cold Stress

Heat and cold stress may vary based upon work activities, personal protective equipment (PPE)/clothing selection, geographical locations, and weather conditions. To reduce the potential of developing heat/cold stress, be aware of the signs and symptoms of heat/cold stress and watch fellow employees for signs of heat/cold stress. Heat stress can be a significant field site hazard, particularly for non-acclimated personnel operating in a hot, humid setting. Site personnel will be instructed in the identification of a heat stress victim, the first-aid treatment procedures for the victim and the prevention of heat stress casualties. Work-rest cycles will be determined and the appropriate measures taken to prevent heat stress as outlined in S3NA\_511\_PR, *Heat Stress* (Attachment B).

Table 4-1 below will be the guidance used in identifying and treating heat-related illness.

<b>Table 4-1 Identification and Treatment of Heat-Related Illness</b>		
<b>Type of Heat-Related Illness</b>	<b>Description</b>	<b>First Aid</b>
Mild Heat Strain	The mildest form of heat-related illness. Victims exhibit irritability, lethargy, and significant sweating. The victim may complain of headache or nausea. This is the initial stage of overheating, and prompt action at this point may prevent more severe heat-related illness from occurring.	<ul style="list-style-type: none"> <li>• Provide the victim with a work break during which he/she may relax, remove any excess protective clothing, and drink cool fluids.</li> <li>• If an air-conditioned spot is available, this is an ideal break location.</li> <li>• Once the victim shows improvement, he/she may resume working; however, the work pace should be moderated to prevent recurrence of the symptoms.</li> </ul>
Heat Exhaustion	Usually begins with muscular weakness and cramping, dizziness, staggering gait, and nausea. The victim will have pale, clammy moist skin and may perspire profusely. The pulse is weak and fast and the victim may faint unless they lie down. The bowels may move involuntarily.	<ul style="list-style-type: none"> <li>• Immediately remove the victim from the work area to a shady or cool area with good air circulation (<i>avoid drafts or sudden chilling</i>).</li> <li>• Remove all protective outerwear.</li> <li>• Call a physician.</li> <li>• Treat the victim for shock. (<i>Make the victim lie down, raise his or her feet 6–12 inches, and keep him/her cool by loosening all clothing</i>).</li> <li>• If the victim is conscious, it may be helpful to give him/ her sips of water.</li> <li>• Transport victim to a medical facility ASAP.</li> </ul>

<b>Table 4-1 Identification and Treatment of Heat-Related Illness</b>		
<b>Type of Heat-Related Illness</b>	<b>Description</b>	<b>First Aid</b>
Heat Stroke	<p>The most serious of heat illness, heat stroke represents the collapse of the <b>body's cooling mechanisms</b>. As a result, body temperature may rise to 104 degrees Fahrenheit or higher. As the victim progresses toward heat stroke, symptoms such as headache, dizziness, nausea can be noted, and the skin is observed to be dry, red, and hot. Sudden collapse and loss of consciousness follows quickly and death is imminent if exposure continues. Heat stroke can occur suddenly.</p>	<ul style="list-style-type: none"> <li>• Immediately evacuate the victim to a cool/shady area.</li> <li>• Remove all protective outerwear and as much personal clothing as decency permits.</li> <li>• Lay the victim on his/her back w/the feet slightly elevated.</li> <li>• Apply cold wet towels or ice bags to the head, armpits, and thighs.</li> <li>• Sponge off the bare skin with cool water.</li> <li>• The main objective is to cool without chilling the victim.</li> <li>• Give no stimulants or hot drinks.</li> <li>• Since heat stroke is a severe medical condition requiring professional medical attention, emergency medical help should be summoned immediately to provide onsite treatment of the victim and proper transport to a medical facility.</li> </ul>



## **5.0 ENVIRONMENTAL PROGRAM (ENVIRONMENT)**

This project and the individual tasks will comply with all federal, state, provincial, and local environmental requirements.

## 6.0 PERSONAL PROTECTIVE EQUIPMENT

The purpose of PPE is to provide a barrier that will shield or isolate individuals from the chemical and/or physical hazards that may be encountered during work activities. The Programmatic HASP lists the general requirements for selection and usage of PPE. Table 6-1 lists the minimum PPE required during site operations and additional PPE that may be necessary for this project. The specific PPE requirements for each work task are specified in the individual THAs (Attachment C). By signing this HASP, the employee agrees to having been trained in the use, limitations, care, and maintenance of the protective equipment to be used by the employee at this project

<b>Table 6-1 Personal Protective Equipment</b>		
<b>Type</b>	<b>Material</b>	<b>Additional Information</b>
<b>Minimum PPE</b>		
<b>Safety Vest</b>	ANSI Type II high-visibility	Must have reflective tape/be visible from all sides
<b>Boots</b>	Leather	ANSI approved safety toe
<b>Safety Glasses</b>		ANSI Approved; ≥98% UV protection
<b>Hard Hat</b>		ANSI Approved; recommended wide-brim
<b>Work Uniform</b>		No shorts/cutoff jeans or sleeveless shirts
<b>Additional PPE</b>		
<b>Hearing Protection</b>	Ear plugs and/ or muffs	In hazardous noise areas
<b>Leather Gloves</b>		If working with sharp objects or powered equipment.
<b>Protective Chemical Gloves</b>	N/A	N/A
<b>Protective Chemical Coveralls</b>	N/A	N/A
<b>Protective Chemical Boots</b>	N/A	N/A
<b>Level C Respiratory Protection</b>	N/A	N/A
<b>Level B Respiratory Protection</b>	N/A	N/A
<b>Sunscreen</b>	SPF 30 or higher	
<b>Fall Protection</b>	N/A	N/A

## **7.0 PROJECT HEALTH AND SAFETY ORGANIZATION**

### **7.1 Task Order Manager [*David Warren*]**

The Task Order Manager (TOM) has overall management authority and responsibility for all site operations, including safety. The TOM will provide the site supervisor with work plans, staff, and budgetary resources, which are appropriate to meet the safety needs of the project operations.

### **7.2 Site Supervisor [*Kara Wimble*]**

The Site Supervisor has the overall responsibility and authority to direct work operations at the job site according to the provided work plans. The TOM may act as the site supervisor while on site.

#### **7.2.1 Responsibilities**

The Site Supervisor is responsible to:

- Discuss deviations from the work plan with the SSO and TOM
- Discuss safety issues with the TOM, SSO, and field personnel
- Assist the SSO with the development and implementation of corrective actions for site safety deficiencies
- Assist the SSO with the implementation of this HASP and ensuring compliance
- Assist the SSO with inspections of the site for compliance with this HASP and applicable SOPs

#### **7.2.2 Authority**

The Site Supervisor has authority to:

- Verify that all operations comply with the requirements of this HASP, and halt any activity that poses a potential hazard to personnel, property, or the environment.
- Temporarily suspend individuals from field activities for infractions against the HASP pending consideration by the SSO, the Resolution Consultants' Health and Safety Manager or designee, and the TOM.

### **7.2.3 Qualifications**

No additional qualifications are required for this phase of work.

## **7.3 Site Safety Officer [*Kara Wimble*]**

### **7.3.1 Responsibilities**

The SSO is responsible to:

- Update the site-specific HASP to reflect changes in site conditions or the SOW. HASP updates must be reviewed and approved by the Resolution Consultants' Health and Safety Program Manager or designee. Updates must be documented using the Revision Log in Attachment A.
- Be aware of changes in Resolution Consultants' Safety Policies, Programmatic HASP, and/or SOPs.
- Monitor the lost time incidence rate for this project and work toward improving it.
- Inspect the site for compliance with this HASP and the SOPs using the appropriate audit inspection checklist provided by the Resolution Consultants' Health and Safety Program Manager or designee.
- Work with the Site Supervisor and TOM to develop and implement corrective action plans to correct deficiencies discovered during site inspections. Deficiencies will be discussed with project management to determine appropriate corrective action(s).
- Contact the Resolution Consultants' Health and Safety Program Manager or designee for technical advice regarding safety issues.
- Determine emergency evacuation routes, establishing and posting local emergency telephone numbers, and arranging emergency transportation.
- Check that all site personnel and visitors have received the proper training and medical clearance prior to entering the site.

- Establish any necessary controlled work areas (as designated in this HASP or other safety documentation).
- Present tailgate safety meetings and maintain attendance logs and records.
- Discuss potential health and safety hazards with the Site Supervisor, Resolution Consultants' Health and Safety Program Manager or designee, and the TOM.
- Select an alternate SSO by name and inform him/her of their duties, in the event that the SSO must leave or is absent from the site. The alternate SSO must be approved by the TOM.

### **7.3.2 Authority**

The SSO has authority to:

- Verify that all operations comply with the requirements of this HASP.
- Issue a "Stop Work Order" under the conditions set forth in this HASP.
- Temporarily suspend individuals from field activities for infractions against the HASP pending consideration by the Resolution Consultants Health and Safety Program Manager or designee and the TOM.

### **7.3.3 Qualifications**

No special qualifications are required for this phase of work.

## **7.4 Employees**

### **7.4.1 Employee Responsibilities**

Responsibilities of employees associated with this project include, but are not limited to:

- Understanding and abiding by the policies and procedures specified in the HASP and other applicable safety policies, and clarifying those areas, where understanding is incomplete.
- Providing feedback to health and safety management relating to omissions and modifications in the HASP or other safety policies.
- Notifying the SSO, in writing, of unsafe conditions and acts.

#### **7.4.2 Employee Authority**

The health and safety authority of each employee assigned to the site includes the following:

- The right to refuse to work and/or stop work authority when the employee feels that the work is unsafe (including subcontractors or team contractors), or where specified safety precautions are not adequate or fully understood.
- The right to refuse to work on any site or operation where the safety procedures specified in this HASP or other safety policies are not being followed.
- The right to contact the SSO or the Resolution Consultants' Health and Safety Program Manager or designee at any time to discuss potential concerns.
- The right and duty to stop work when conditions are unsafe, and to assist in correcting these conditions

#### **7.5 Resolution Consultants Health and Safety Program Manager [*Steve Skipper, CIH, CSP, CHMM*]**

The Health and Safety Manager is assigned to provide guidance and technical support for the project. Duties include the following:

- Approving this HASP and any required changes
- Approving the designated SSO
- Reviewing all personal exposure monitoring results
- Investigating any reported unsafe acts or conditions

The Health and Safety Manager may designate another safety professional as the direct liaison for this project; if that is the case, he will remain available for any, or all of the tasks listed here or elsewhere in this HASP in lieu of the designee.

#### **7.6 Visitors**

Authorized visitors (e.g., client representatives, regulators, Resolution Consultants' management staff, etc.) requiring entry to any work location on the site will be briefed by the Site Supervisor on the hazards present at that location. Visitors will be escorted at all times at the work location and will be responsible for compliance with their employer's health and safety policies.

## **8.0 EMERGENCY RESPONSE PLANNING**

### **8.1 Emergency Action Plan**

Although the potential for an emergency to occur is remote, an emergency action plan has been prepared for this project should such critical situations arise. The only significant type of onsite emergency that may occur is physical injury or illness to a member of the Resolution Consultants team. The Emergency Action Plan (EAP) will be reviewed by all personnel prior to the start of field activities. A test of the EAP will be performed within the first three (3) days of the project field operations. This test will be evaluated and documented in the project records.

Three major categories of emergencies could occur during site operations:

1. Illnesses and physical injuries (including injury-causing chemical exposure)
2. Catastrophic events (fire, explosion, earthquake, or chemical)
3. Workplace Violence, Bomb Threat
4. Safety equipment problems

#### **8.1.1 Emergency Coordinator**

The duties of the Emergency Coordinator (EC) include:

- Implement the EAP based on the identified emergency condition
- Notify the appropriate project and SH&E department personnel of the emergency (Table 8-1)
- Verify emergency evacuation routes and muster points are accessible
- Conduct routine EAP drills and evaluate compliance with the EAP



<b>Table 8-1 Emergency Coordinators/Key Personnel</b>			
<b>Name</b>	<b>Title/Workstation</b>	<b>Telephone Number</b>	<b>Mobile Phone</b>
	Client Contact		
David Warren	Project Manager	843-884-0029	843-323-1682
Kara Wimble	Site Supervisor/SSO	904-367-4324	N/A
Steve Skipper	Resolution Consultants H&S Program Manager	904-367-4324	865-607-1082
Phil Platcow	AECOM Regional SH&E Manager		617-899-5403
Sean Liddy	AECOM District SH&E Manager		410-869-6164
John Knopf	EnSafe H&S Manager	901-372-7962	901-937-4255
Incident Reporting	EnSafe — call Steve Skipper Or John Knopf	865-693-3623 901-372-9262	865-607-1082 901-451-1464
Eric Hamilton	AECOM TDG/IATA Shipping Expert, Level 1 Shipper		804-357-8109
Kevin Arick	EnSafe TDG/IATA Shipping Expert	901-372-7962	901-356-3525
<b>Organization/Agency</b>			
<b>Name</b>			<b>Telephone Number</b>
Police Department (local)			911
Fire Department (local)			911
Ambulance Service <b>(EMT will determine appropriate hospital for treatment)</b>			911
Emergency Hospital <b>(Use by site personnel is only for emergency cases)</b>			
Southeast Georgia Health System Camden Campus			
501 Kings Bay Road, Kingsland, GA 31548			912-576-6190
Emergency Hospital Route: See Figure 8-1			
Poison Control Center			800-222-1222
Pollution Emergency			800-292-4706
National Response Center			800-424-8802
Title 3 Hotline			800-424-9346
<b>Public Utilities</b>			
<b>Name</b>			<b>Telephone Number</b>
<i>Call Before You Dig</i>			811 800-892-0123

### 8.1.2 Site-Specific Emergency Procedures

Prior to the start of site operations, the EC will complete Table 8-2 with any site-specific information regarding evacuations, muster points, communication, and other site-specific emergency procedures.

<b>Table 8-2 Emergency Planning</b>		
<b>Emergency</b>	<b>Evacuation Route</b>	<b>Muster Location</b>
<b>Chemical Spill</b>	<ul style="list-style-type: none"> <li>Upwind</li> </ul>	<ul style="list-style-type: none"> <li>Site vehicles</li> </ul>
<b>Fire/Explosion</b>	<ul style="list-style-type: none"> <li>Upwind</li> </ul>	<ul style="list-style-type: none"> <li>Site vehicles</li> </ul>
<b>Tornado/Severe Weather</b>	<ul style="list-style-type: none"> <li>Closest available tornado shelter</li> </ul>	<ul style="list-style-type: none"> <li>Building # (TBD by SSO)</li> </ul>
<b>Lightning</b>	<ul style="list-style-type: none"> <li>Closest available shelter</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle/Site Trailer</li> </ul>
<b>Additional Information</b>		
<b>Communication Procedures</b>	Direct verbal communications, however; must be supplemented anytime voices cannot be clearly perceived above ambient noise levels (e.g., noise from heavy equipment; drilling rigs, backhoes, etc.) and anytime a clear line-of-sight cannot be easily maintained amongst all Resolution Consultants personnel because of distance, terrain or other obstructions. Verbal communications will be adequate to warn employees of hazards associated with the immediate work area. Resolution Consultants personnel will bring a mobile phone to the site to ensure that communications with local emergency responders is maintained, when necessary.	
<b>CPR/First Aid Trained Personnel</b>	Steven Hodskins, David Warren, Kara Wimble	
<b>Site-Specific Spill Response Procedures</b>	Not Applicable	

### 8.1.3 Safety Accident/Incident Reporting

All accidents and incidents that occur onsite during any field activity will be promptly reported to the SSO, immediate supervisor, and Program Manager.

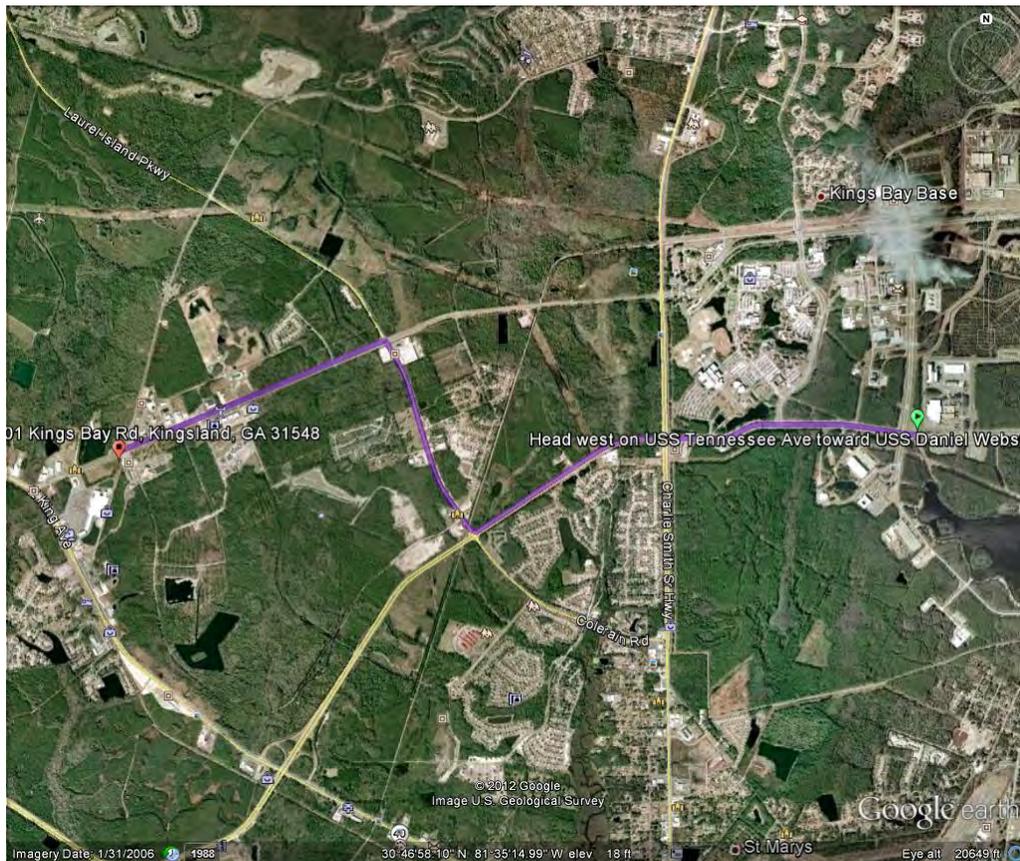
If any Resolution Consultants employee is injured and requires medical treatment, the Site Supervisor will report the incident in accordance with Resolution **Consultants'** incident reporting procedures. **A copy of the final Supervisor's Report of Incident** will be provided to the Resolution Consultants Health and Safety Manager or designee before the end of the following shift. If any employee of a subcontractor is injured, documentation of the incident will be **accomplished in accordance with the subcontractor's procedures; however, copies of all** documentation (which at a minimum must include the Occupational Safety and Health Administration Form 301 or equivalent) must be provided to the SSO within 24 hours after the accident has occurred.

All accidents/incidents will be investigated. Copies of all subcontractor accident investigations will be provided to the SSO within five (5) days of the accident/incident.

## **Southeast Georgia Health System Camden Campus 501 Kings Bay Road, Kingsland, GA 31548**

Resolution personnel will use this location as their primary care location.

1. Head west on USS Tennessee Avenue toward USS Daniel Webster Road
2. Continue onto USS Benjamin Franklin Drive
3. Continue onto St Mary's Rd4. Turn right onto S 3rd Street
4. Turn right onto Colerain Road
5. Turn left onto Kings Bay Road
6. Turn right onto County Road 78/Winding Road



**Figure 8-1 Emergency Occupational Hospital Route/Detail Map**



**Attachment A**  
**Revision Log**



**Attachment B**  
**Applicable Standard Operating Procedures**

## S3NA-313-PR Wildlife, Plants and Insects

### 1.0 Purpose and Scope

- 1.1 Communicates the requirements and precautions to be taken by Resolution employees to protect against the biological hazards associated with insects, arachnids, snakes, poisonous plants, and other animals referred to herein collectively as “biological hazards”.
- 1.2 This procedure applies to all Resolution employees and operations.

### 2.0 Terms and Definitions

- 2.1 **Field Work:** Field work is defined as any activity conducted at a site that contains brush, overgrown grass, leaf litter, poisonous plants, or is located near mosquito breeding areas and includes work in structures where animals might exist that harbor fleas or ticks or where spiders and mites could be present. Field work includes, but is not limited to, Phase I, Phase II, Operations Monitoring & Maintenance (OM&M), biological surveys, and other work that meets the definition of field work.
- 2.2 **Poisonous:** Capable of harming or killing by or as if by poison; toxic or venomous.
- 2.3 **Phase I Environmental Site Assessment:** Investigation of real property to determine the possibility of contamination, based on visual observation and property history, but no physical testing. Under new Environmental Protection Agency regulations that went into effect on November 1, 2006, a Phase I, as it is called for short, will be mandatory for all investors who wish to take advantage of CERCLA defenses that will shield them from liability for future cleanup, should that prove necessary. The new Phase I rules, called “All Appropriate Inquiry” or AAI, also require more investigation than previously mandated. Investors can expect to see dramatic price increases over prior experiences.
- 2.4 **Phase II Environmental Site Assessment:** Investigation of real property through physical samplings and analyses to determine the nature and extent of contamination and, if indicated, a description of the recommended remediation method.

### 3.0 References

- 3.1 Public Health Agency of Canada (<http://www.phac-aspc.gc.ca/id-mi/tickinfo-eng.php>) on Ticks and Lyme Disease in Canada
- 3.2 Public Health Agency of Canada (<http://www.phac-aspc.gc.ca/wn-no/index-eng.php>) on West Nile Virus
- 3.3 United States Center for Disease Control (CDC) (<http://www.cdc.gov/ncidod/dvbid/lyme/index.htm>) on Lyme Disease
- 3.4 New York State Department of Health, 2007. Health Advisory, Tick and Insect Repellents. <http://www.health.state.ny.us/nysdoh/westnile/pdf/2737.pdf>
- 3.5 Spectrum Brands, 2007. Personal Insect Repellent Products. [http://www.spectrumbrandshomeandgarden.com/CorpNav/AboutSpectrum/ProductCategories/insect\\_repellent.htm](http://www.spectrumbrandshomeandgarden.com/CorpNav/AboutSpectrum/ProductCategories/insect_repellent.htm)
- 3.6 U.S. Centers for Disease Control and Prevention, 2004. Tick Management Handbook. <http://www.cdc.gov/ncidod/dvbid/lyme/resources/handbook.pdf>
- 3.7 U.S. Environmental Protection Agency, 2006. Permethrin Facts: Preregistration Eligibility Decision Fact Sheet. [http://www.epa.gov/oppsrrd1/reregistration/REDs/factsheets/permethrin\\_fs.htm](http://www.epa.gov/oppsrrd1/reregistration/REDs/factsheets/permethrin_fs.htm)
- 3.8 U.S. National Pesticide Information Center, 1997, National Pesticide Telecommunications Network Fact Sheet for Permethrin. <http://npic.orst.edu/factsheets/permethrin.pdf>
- 3.9 U.S. Environmental Protection Agency, 2005. New Pesticide Fact Sheet, Picaridin <http://www.epa.gov/oppr001/factsheets/picaridin.pdf>

## 4.0 Procedure

### 4.1 Roles and Responsibilities

#### 4.1.1 Project Managers and Supervisors

- **Project Managers** and **Supervisors** responsible for managing field work will work with employees conducting the work to see that a Task Hazard Analysis (THA) for the work to be conducted has been performed prior to the beginning of the field work and that it includes an assessment of potential biological hazards.
- If biological hazards are identified as an exposure risk in the workplace, control measures that may be applied at the project site will be implemented to reduce the potential for employees to be exposed to injuries and illnesses while working.
- If the exposures cannot be eliminated or managed with engineering controls, the **Project Manager** or **Supervisor** will approve the use of PPE and protective repellents and lotions and ensure that exposed employees have and use these products.

#### 4.1.2 District Operations Manager

- Approve the costs associated with the PPE and materials necessary to protect employees from the biological hazards covered by this Procedure.
- During the performance of project site visits, managers will assess the precautions being taken against the requirements of this Procedure.

#### 4.1.3 Regional SH&E Manager

- Participate in incident reporting and investigations when appropriate.
- Work with office SH&E Department and project Safety Professionals, provide training and guidance to employees consistent with this procedure.
- Assist project teams in identifying hazards and selecting appropriate control measures.

#### 4.1.4 Operational Managers

- Assure implementation of this procedure in their regions and offices.
- Participate in incident reporting and investigations when appropriate.

#### 4.1.5 Employees

- Participate in required training on this procedure.
- Participate in the development of THAs for the project, identify control measures to limit exposure and request PPE, repellents, and protective lotions required by this Procedure.
- Obtain approval from **Project Managers** and/or **Supervisors** to purchase selected PPE prior to purchasing.
- Implement the precautions appropriate to prevent exposure to the hazardous wildlife, insects and plants.
- Observe requirements for reporting as detailed within the Procedure.
- Participate in incident reporting and investigations when appropriate.

### 4.2 Overview

4.2.1 The procedures discussed below are detailed because these hazards have historically posed the most significant risk to Resolution employees. Note that this discussion is not a fully encompassing list of hazards and as part of the Task Hazard Analysis conducted by the project team, additional consideration must be given to other biological hazards.

4.2.2 Departments of Public Health local to the worksite, as well as the Centers for Disease Control (CDC) can serve as a resource for identifying biological hazards not discussed in this Procedure.

4.2.3 If additional biological hazards are identified, the project team should contact the **Resolution SH&E Manager** to discuss the hazards and identify effective control measures that can be implemented at the project site.

### 4.3 **Planning and Hazard Assessment**

- 4.3.1 The Resolution project team shall ensure that the potential for exposure to specific biological hazards are assessed prior to the commencement of work and that the procedures specified by this SOP are integrated into the project planning process and conveyed to Resolution employees conducting the field work. This information shall be communicated in the site specific Safe Work Plan (SWP), Health and Safety Plan (HASP), the THA, pre-project kickoff meetings, and tailgate meetings at the project site.
- 4.3.2 It is important to note that the precautions to be taken by Resolution employees to decrease the risk of exposure to biological hazards can directly increase the risk of heat-related illness due to thermal stresses. Therefore, heat stress monitoring and precautions shall be included as a critical component of the project-specific hazard assessments in accordance with *S3NA-511-PR Heat Stress*.
- 4.3.3 During the preparation of the project specific Safe Work Plan (SWP), HASP and project specific THA, **Project Managers, Supervisors**, and the project staff will determine what biological hazards might be encountered during the project and will prescribe the precautions to be taken to reduce the potential for exposure and the severity of resulting illnesses. Consideration will be given to conditions such as weather, proximity to breeding areas, host animals, and published information discussing the presence of the hazards.
- 4.3.4 It should be assumed that at least one of the biological hazards exists whenever working on undeveloped property. This can include insect activity any time that local temperatures exceed 40°F for a period of more than 24 hours. The stubble and roots of poisonous plants can be a hazard any time of year, including when some plants are dormant or mown.
- 4.3.5 The hazard assessments must also consider the additional hazards posed by vegetative clearing such as the increased risk of coming in contact with poison ivy, oak or sumac and hazards associated with the use of tools and equipment to remove vegetation.
- 4.3.6 Employees in the field where biological hazards exist will not enter the hazard areas unless they are wearing the appropriate protective clothing, repellents, and barrier creams specified below. If the hazard is recognized in the field but was not adequately assessed during the THA, the affected employees shall stop work and not proceed until the THA has been amended and protective measures implemented.
- 4.3.7 A decision flow chart and table for determining the potential for biological hazards in US states has been provided in *S3NA-313-W11 Biological Hazard Assessment Decision Flow Chart Hazard Assessment (US States)*.

### 4.4 **Restrictions**

- 4.4.1 Staff with life-threatening reactions shall not undertake work in areas infested with the allergen (e.g., wasps, poison ivy), unless precautions are met which satisfy a medical practitioner's requirements.

### 4.5 **Employee Sensitivity**

- 4.5.1 Sensitivity to toxins generated by plants, insects and animals varies according to dosage and the ability of the victim to process the toxin, therefore it is difficult to predict whether a reaction will occur, or how severe the reaction will be. Staff should be aware that there are a large number of organisms capable of causing serious irritations and allergic reactions. Some reactions will only erupt if a secondary exposure to sunlight occurs. Depending on the severity of the reaction, the result can be severe scarring, blindness or even death.
- 4.5.2 Employees also need to consider whether they are sensitive to the use of insect repellents.

### 4.6 **Personal Protective Equipment**

- 4.6.1 The selection of Personal Protective Equipment is dependent on the hazard present and a PPE Hazard Analysis should be conducted to determine situation specific PPE required. (refer to SOP *S3NA-208 Personal Protective Equipment Program*)
- 4.6.2 At a minimum, in addition to any project specific PPE, long sleeves and pants should be worn on field projects where the risk of biological encounter exists.
- 4.6.3 PPE for insects should include sunscreen, bug nets, bug jackets, or insect repellent. Socks should be pulled over pant legs and rubber boots should be worn where the threat of exposure is anticipated.

- 4.6.4 Epi-pens<sup>1</sup> or other personal medication should be carried by those staff that are aware that anaphylactic shock is a possibility for them.
- 4.7 **Remedies**
- 4.7.1 If you suspect exposure to an irritant, identify the cause including obtaining a specimen if possible. Document the occurrence as a safety precaution if the exposure should lead to complications.
- 4.7.2 Go to a doctor or call WorkCare for advice if necessary.
- 4.8 **Training**
- 4.8.1 Field staff must learn to recognize organisms that represent a threat in the regions in which they work – experienced field staff must provide on the job training to assist staff with hazard recognition.
- 4.8.2 Staff who have severe allergic reactions are strongly recommended to notify their project manager, field supervisor, and co-workers of the potential for a reaction and demonstrate what medication they might need and how it is administered.
- 4.9 **Insects**
- 4.9.1 Insects for which precautionary measures should be taken include but are not limited to: mosquitoes (potential carriers of disease aside from dermatitis), black flies, wasps, bees, ticks, Fire Ants and European Fire Ants.
- 4.9.2 Wasps and bees will cause a painful sting to anyone if they are harassed. They are of most concern for individuals with allergic reactions who can go into anaphylactic shock. Also, instances where an individual is exposed to multiple stings can cause a serious health concern for anyone. These insects are most likely to sting when their hive or nest is threatened.
- 4.9.3 Ticks can be encountered when walking in tall grass or shrubs. They crawl up clothing searching for exposed skin where they will insert mouthparts to drink blood. The most serious concern is a possibility of contracting Lyme disease which is spread by the Black-legged or Deer Tick. The larger Wood Ticks are widespread in the west but these rarely carry diseases. Occasionally a tick can cause Tick Paralysis if it is able to remain feeding for several days. Full recovery usually occurs shortly after the tick is removed.
- 4.9.4 The Fire Ant (southern and western US) and the European Fire Ant (northeastern US and eastern Canada) is often very abundant where it is established. It is very aggressive and commonly climbs up clothing and stings unprovoked when it comes into contact with skin. Painful irritations will persist for an hour or more.
- 4.10 **Ticks**
- 4.10.1 Data from the CDC indicates that tick-borne diseases have become increasingly prevalent. At the same time, tick repellents have become both safe and effective so it is possible to prevent the vast majority of bites and therefore most related illnesses.
- 4.10.2 The most common and severe tick-borne illnesses in the U.S. are Lyme disease, Ehrlichiosis, and Rocky Mountain spotted fever. A summary table listing CDC informational resources for these diseases is provided in *S3NA-313-W/2 Ticks* along with a listing of CDC information resources and maps showing the distribution of common tick-borne diseases in the U.S.
- 4.10.3 When working in areas where ticks may occur, it is recommended that clothes are turned inside out and shaken at the end of day; do not wear the same clothes two days in a row.
- 4.10.4 To remove ticks that are embedded in skin, use tweezers or fingers to carefully grasp the tick as close to the skin as possible and pull slowly upward, avoiding twisting or crushing the tick. Do not try to burn or smother the tick. Cleanse the bite area with soap and water, alcohol, or household antiseptic. Note the date and location of the bite and save the tick in a secure container such as an empty pill vial or film canister. A bit of moistened paper towel placed inside the container will keep ticks from drying out.

---

<sup>1</sup> Epi-pens must be prescribed by a personal physician. Renew epi-pens on a regular schedule to ensure effectiveness and make sure your field companions know where it is and how to use it if you cannot self administer the dose.

- 4.10.5 Familiarize yourself with the characteristic bulls-eye pattern of Lyme disease infection surrounding the bite. If noted, report to medical help for inoculation.
- 4.10.6 If possible, submit any ticks found or captured to the following laboratories for species identification.
- Canada – National Microbiology Laboratory (NML) (Phone: (204) 789-2000; email: [ticks@phac-aspc.gc.ca](mailto:ticks@phac-aspc.gc.ca)). The NML will conduct diagnostic testing for the Lyme disease agent as well as several other disease-causing agents. The NML results will not only benefit anyone bit by the tick, but will also assist the NML in their goal to accurately map the distribution of the tick species and associated diseases in Canada.
  - US – IGeneX, Inc. (Phone: (800) 832-3200; [www.igenex.com](http://www.igenex.com)). IGeneX will test the tick for the presence of the Lyme bacteria. They also test ticks for *Babesia microti* and/or *Babesia duncani* (formerly WA-1), Ehrlichia, Bartonella henselae and Rickettsia (Rocky Mountain Spotted Fever). These diseases are also carried by ticks. The testing request form is attached as *S3NA-313-FM Tick Test Request Form*.
- 4.10.7 If you experience symptoms such as fever, headache, fatigue, and a skin rash, you should immediately visit a medical practitioner as Lyme disease is treated easily with antibiotics in the early stages, but can spread to the heart, joints, and nervous system if left untreated.
- 4.11 **Chiggers**
- 4.11.1 Chiggers are mite larvae, approximately ½ mm in size, and typically invisible to the naked eye. While chiggers are not known to carry infectious diseases, their bites and resulting rashes and itching can lead to dermatitis and a secondary infection.
- 4.11.2 Chiggers are typically active from the last hard freeze in the winter or spring to the first hard freeze. They are active all year in the Gulf Coast and tropical areas.
- 4.12 **Spiders**
- 4.12.1 Spiders can be found in derelict buildings, sheltered areas, basements, storage areas, well heads and even on open ground. Spiders can be found year round in sheltered areas and are often present in well heads and valve boxes.
- 4.12.2 Most spider bites produce wounds with localized inflammation and swelling. The Black Widow and Brown Recluse spiders in the US and others outside the US inject a toxin that causes extensive tissue damage and intense pain.
- 4.12.3 Additional information on spider identification can be found in attachment *S3NA-313-WI3 Poisonous Spider Identification*.
- 4.13 **Mosquitoes**
- 4.13.1 Mosquitoes can transmit the West Nile Virus and other forms of encephalitis after becoming infected by feeding on the blood of birds which carry the virus. Positive cases of West Nile Virus have been confirmed throughout North America since 2007.
- 4.13.2 Most people infected with the virus experience no symptoms or they have flu-like symptoms. Sometimes though, the virus can cause severe illness, resulting in hospitalization and even death ,so proper precautions should be taken. Consult a medical practitioner if you suspect you have West Nile Virus.
- 4.13.3 When a mosquito bites, it injects an enzyme that breaks down blood capillaries and acts as an anticoagulant. The enzymes induce an immune response in the host that results in itching and local inflammation. The tendency to scratch the bite sites can lead to secondary infections.
- 4.13.4 CDC data indicates that mosquito-borne illnesses, including the strains of encephalitis, are a health risk to employees working in outdoor environments. At least one of the Encephalitis strains listed below is known to exist in every area of the U.S. and in many other countries as well:
- Eastern Equine encephalitis (EEE)
  - Western Equine encephalitis (WEE)
  - West Nile Virus
  - St. Louis encephalitis (SLE)
  - La Crosse (LAC) encephalitis

- 4.13.5 Other diseases including Dengue Fever and Malaria are spread by mosquitoes in the sub-tropic and tropical parts of the world. See S3NA-313-WI4 *Mosquito Borne Diseases* for information on the locations where mosquito borne diseases are known to be present.
- 4.14 **Bees and Hornets**
- 4.14.1 Bees, hornets, and wasps may be found in derelict buildings, sheltered areas, and even on open ground. The flying/stinging insects are not specifically included in the scope of this procedure and the PPE and other protective measures are not normally effective against aggressive, flying insects. Avoid reaching into areas where visibility is limited.
- 4.14.2 If stung by a wasp or bee or hornet, notify a co-worker or someone who can help should you have an allergic reaction. Stay calm and treat the area with ice or cold water. Seek medical attention if you have any reactions to the sting such as developing a rash, excessive swelling or pain at the site of the bite or sting, or any swelling or numbness beyond the site of the bite or sting.
- 4.14.3 Employees with known allergies to insect stings should consult their personal physician for advice on any immediate medications that they should carry with them. Resolution highly recommends that employees with known allergies inform their co-workers of the allergy and the location of the medications they might carry for the allergy.
- 4.15 **Poisonous Plants**
- 4.15.1 Poisonous plants including poison ivy, oak and sumac, which contain the oil urushiol that produces a rash, can lead to dermatitis and infections. Exposure to urushiol produces a rash that can be irritating and cause the exposed employee to scratch the affected area, increasing susceptibility for an infection. It should be noted that each time an employee is exposed to urushiol the severity of the reaction increases. In cases that involve severe rashes, medical treatment may be necessary to control the rash.
- 4.15.2 Wild parsnip is found throughout the U.S. and contains a poison that produces a rash similar to poison oak and ivy. Unlike poison oak and ivy, the active oil will not be present on unbroken leaves. See S3NA-313-WI6 *Wild Parsnip Identification* for additional information and photos of wild parsnip.
- 4.15.3 Plants that field staff should recognize and take precautions to avoid include: Poison Sumac, Poison Ivy (terrestrial and climbing), Poison Oak, Giant Hogweed<sup>2</sup> (or Giant Cow Parsnip), Wild Parsnip, Devil's Club and Stinging Nettle. Many others are extremely poisonous to eat (e.g., Poison Hemlock; Water Parsnip) – do not eat anything that has not been identified.
- 4.15.4 See S3NA-313-WI5 *Plants of Concern* for information on locations where some of these poisonous plants are found in the US.
- 4.15.5 Of the toxic plants in the cashew family, Poison Ivy (*Rhus radicans*) is most widespread occurring across southern Canada. It is usually a low sprawling shrub or ground cover but in southwestern Ontario it also grows as a thick woody vine that grows high into the tree canopy. Poison Oak (*Rhus diversiloba*) is a low shrub that grows only in southwestern British Columbia and Poison Sumac (*Rhus vernix*) is a tall shrub that grows in southern Ontario but is quite rare. All of these plants possess urushiol oils in nearly all parts of the plant. Touching the plant causes an itchy skin rash that shows up several days following contact. People have a wide range of reactions which in severe cases can lead to oozing blisters on large parts of the body. Some people apparently never react and others may develop an allergy after no reaction after years of frequent contact.
- 4.15.6 Several plants in the carrot family contain toxic sap that causes severe dermatitis if it comes into contact with skin that is then exposed to sunlight. The most serious reaction is caused by the Giant Hogweed (*Heracleum mantegazzianum*), a garden that is spreading in southern Ontario and is also present in southwestern British Columbia. The plant is enormous, attaining up to 5 m in height, which it does in one growing season. Contact causes painful blistering that can cause permanent disfigurement. It is to be avoided. Similar but less serious reactions can be caused by Meadow Parsnip (*Pastinaca sativa*) and Cow Parsnip (*Heracleum lanatum*). Meadow Parsnip can be very abundant on disturbed sites.
- 4.15.7 Nettles, particularly Stinging Nettle (*Urtica dioica*) and Wood Nettle (*Laportea canadensis*) contain urticating hairs on the leaves and stems that cause sharp pain or itchiness on contact with skin. The

---

<sup>2</sup> *Phytophotodermatitis producer: keep skin covered and wash well after exposure*

irritation is immediate and normally lasts no more than an hour and there are no lasting consequences.

- 4.15.8 Some plants contain abundant stiff spines that can present a safety hazard, particularly if one is to fall into them. Fragile Prickly Pear cactus (*Opuntia fragilis*) is common in semi arid areas of the southern Prairie Provinces and interior British Columbia. Pieces will break off and imbed into one's ankle by scarcely brushing them. Devils Club (*Oplopanax horridum*) can form dominant understorey in humid forests among the western mountains. It contains semi-soft spines on the stems that will break off in the skin causing considerable irritation for days. In some areas of Ontario, Prickly-ash (*Zanthoxylon americanum*) a tall shrub with sturdy spines, sometimes forms dense single stands that are nearly impenetrable.
- 4.15.9 A large number of plants are not harmful to touch but may contain poisonous berries or foliage that could cause serious complications or death if they are ingested. It goes without saying not to eat any berries or plants if you are not absolutely sure of their identity.
- 4.15.10 Of all the plants, Giant Hogweed presents the most serious health risk. Field staff should learn to recognize and avoid it if encountered.
- 4.15.11 Employees who develop a rash as a result of exposure to poisonous plants shall report the exposure immediately to their **Supervisor** or **Project Manager** who will then forward the report to the **Regional SH&E Manager**.

#### 4.16 **Additional Biological Hazards**

4.16.1 Additional Work Instructions are provided for protection and prevention from the following:

- S3NA-313-WI11 *Large Carnivores*
- S3NA-313-WI12 *Bear Safety*
- S3NA-313-WI13 *Small Mammals*
- S3NA-313-WI14 *Snakes*
- S3NA-313-WI15 *Alligators*

#### 4.17 **Habitat Avoidance, Elimination, and/or Control**

4.17.1 Ticks, Spiders and Insects

- The most effective method to manage worker safety and health is to eliminate, avoid and/or control hazards. Clearing the project site of brush, high grass and foliage reduces the potential for exposure to biological hazards. Clearing will not eliminate the exposure to flying insects and there might be an increased exposure to ticks, spiders, and poisonous plants during the clearing process.
- Resolution projects such as subsurface environmental assessment or remediation are often candidates for brush and overgrown grass to be cleared. In these instances, the Resolution project manager shall either request that the client eliminate vegetation, or request approval from the client to have vegetation clearing added to the scope of work.
- When projects must be conducted in areas that cannot or may not be cleared of foliage, personal precautions and protective measures outlined in this SOP shall be prescribed.
- Mosquitoes breed in stagnant water and typically only travel a quarter mile from their breeding site. Whenever possible, stagnant water should be drained to eliminate breeding areas. Project Managers and client site managers should be contacted to determine whether water can be drained and the most appropriate method for draining containers, containment areas, and other objects of standing water.
- If water cannot be drained, products similar to Mosquito Dunks® can be placed in the water to control mosquitoes. Once wet, the Mosquito Dunks® kill the immature, aquatic stage of the mosquito. The active ingredient is a beneficial organism that is lethal to mosquito larvae, but harmless to fish, humans, and other animals. Mosquito Dunks® provide long-term protection for 30 days or more.

4.17.2 Poisonous Plants

- If poisonous plants are identified in the work area, employees will mark the plants using either flags or marking paint, and discuss what the specific indicator will be to signal to other employees

to avoid the designated area. If employees decide to use ground-marking paint to identify poisonous plants, they should discuss this tactic with the **Project Manager** and/or Client to gain approval.

- If removal of the plants is considered, it should be subcontracted to a professional landscaping service that is capable and experienced in removing the plant. If herbicides are considered for use, a discussion will need to occur with the **Project Manager** and Client to determine whether it is acceptable to apply herbicides at the work site. Application of herbicides may require a license.
- Resolution employees shall not attempt to physically remove poisonous plants from the work area unless a clearing procedure including PPE is prepared in advance and approved by the Regional SH&E Manager. If a SWP or HASP is prepared for the project, the clearing procedure should be included and the required PPE specified.

#### 4.17.3 Bird Droppings

- Bird excrement may be encountered due to the nesting of pigeons and other birds and winged animals (e.g., bats) on or in structures. Substantial accumulations of droppings can pose physical and health risks as slippery surfaces (if wet) and if the material is disturbed and becomes airborne, it can be inhaled or ingested if personal hygiene practices are not implemented. Inhalation of airborne droppings can cause diseases such as histoplasmosis. Exposure to surfaces with bird droppings shall be safeguarded by implementing proper work practices, training employees for awareness and using PPE. See *S3NA-313-WI10 Bird Droppings Safe Work Practices*.

### 4.18 Personal Precautions and Personal Protective Measures

#### 4.18.1 Precautions

- Be aware of the potential irritants in your area and know how to recognize them.
- Modify activities to avoid encounters (diurnal rhythms, seasonal rhythms).
- Wear protective clothing.
- When working in areas where there may be small insects that “hitchhike” (e.g., ticks, spiders, scorpions), it is recommended that clothes are turned inside out and shaken at the end of day; do not wear same clothes two days in a row.
- Staff should always be aware of where they are placing their hands, or where they are sitting in order to avoid contact with potential toxins.

#### 4.18.2 PPE

- The following recommendations may be considered by the project team to determine if the use of PPE is necessary for the type of work planned: Disposable gloves may be cotton, leather, or synthetic materials and must not be reused after removing.
- Clearing activities present the greatest risk of employee exposure but reduce the risks once completed. Recommendation – Resolution employees actively participating in clearing will use full protection from ticks and insects during the clearing activities including insect repellents, Tyvek® coveralls, and gloves.
- If the foliage being cleared includes poisonous plants, exposed skin will be treated with a dermal barrier cream such as Tecnu®'s Oak 'n Ivy Armor or Enviroderm's Ivy Block and either a full face respirator or a half face respirator (with goggles) fitted with a P-100 (HEPA) dust filter.
- Work in habitats with direct exposure to ticks, mosquitoes, and poisonous plants is likely and the scope of work does not allow for worksite control measures like vegetative clearing: Recommendation – Full protection from biological hazards including insect repellents, Tyvek® coveralls or full length clothing, poisonous plant barrier creams and wipes, and gloves.
- Work in habitats with direct exposure to ticks and mosquitoes and no exposure to poisonous plants is likely and the scope of work typically does allow for worksite control measures like vegetative clearing: Recommendation – Protection including insect repellents and Tyvek® coveralls or full length clothing.
- Work in habitats with direct exposure to poisonous plants and no exposure to ticks or insects is likely and the scope of work does not allow for worksite control measures like vegetative clearing: Recommendation – Full protection from poisonous plants including insect repellents, Tyvek® coveralls or full length clothing, poisonous plant barrier creams and wipes, and gloves.

- Industrial/Commercial/Office Facilities – Direct contact with biological hazards is considered unlikely or low risk: Recommendation – PPE for biological hazards are not required; however, Tyvek coveralls and insect repellent should be available if exposure to spiders, flying insects, or other biological hazards is encountered.
- Work in areas where no biological hazards are expected because of the local environment, winter weather, or property development: Recommendation – PPE for biological hazards is not required; however, Tyvek® coveralls and insect repellent should be available if exposures to spiders, flying insects, or other biological hazards are encountered.
- The following precautions and protective measures shall be implemented by Resolution employees conducting field work where the biological hazards covered by this SOP exist:

#### 4.18.3 Insects, Spiders, and Ticks

- Chemically-treated field clothing, full-length clothing, or Tyvek® coveralls.
- Application of insect repellent to clothing and/or exposed skin.
- Routine personal checks.
- Exercise care when collecting samples and avoid reaching into areas where visibility is limited. If stung by an insect or bitten by a spider or tick, attempt to identify the attacker and notify a co-worker or someone who can help should the bite site become painful, discolored, or swollen. Stay calm and treat the area with ice or cold water. Seek medical attention if you have any reactions to the sting such as developing a rash, excessive swelling or pain at the site of the bite, or any swelling or numbness beyond the site of the bite.
- Oil of lemon eucalyptus, DEET, and Permethrin have been recommended by the Centers for Disease Control and Prevention for effective protection against mosquitoes that may carry the West Nile virus and related diseases.
- Note that DEET will reduce the effectiveness of Fire Resistance Clothing (FRC) and should not be applied to this clothing. If working in FRC, employees can apply DEET to their skin and let dry prior to putting FRC on, or use Permethrin as it has been shown not to reduce the effectiveness of FRC. Permethrin will need to be applied to FRC well in advance of the planned work.

#### 4.18.4 Poisonous Plants

- Employees working in areas where poisonous plants exist shall wear either long sleeve clothing or Tyvek® coveralls, and disposable cotton, leather or synthetic gloves. Employees must not touch exposed skin (neck and face) with potentially contaminated gloves. Tyvek® and gloves worn to protect from exposure to poisonous plants will be treated as contaminated, removed from the body in a manner that the contamination is not spread, and placed in plastic bags for disposal.
- Personal clothing that has been exposed to poisonous plants shall be decontaminated with a poisonous plant cleanser such as Tecnu® or removed in a careful manner, bagged and washed separately from other clothing to remove urushiol.
- Work boots will be decontaminated with either soap and water or a cleansing agent such as Tecnu® cleanser.
- Remember that in the fall and winter the hazard still exists in the form of stubble and roots.
- Employees who develop a rash as a result of exposure to poisonous plants shall report the exposure immediately to their **Supervisor** or **Project Manager** who will forward the report to the RSHEM.
- For dermatitis caused by Poison Ivy, Poison Oak, or Poison Sumac, calamine lotion is effective.

#### 4.19 Selection and Configuration of Field Clothing

4.19.1 At a minimum, employees will wear long legged pants and long sleeve shirts or Tyvek® coveralls to reduce the amount of exposed skin when biological hazards are identified at the work site. Gloves will also be worn consistent with the recommendations of the site-specific SWP, HASP and/or THA to minimize hand exposure.

4.19.2 Where ticks, chiggers, and spiders are presumed to exist, the Tyvek® or chemically-treated clothing will be taped to the work boots.

4.19.3 See *S3NA-313-WI7 Configuration Clothing for Protection* against ticks and insects for illustrations and instructions for configuring, taping, and tucking clothing.

#### 4.19.4 Chemical Treatment of Field Clothing

- Oil of lemon eucalyptus, DEET, and Permethrin have been recommended by the Centers for Disease Control and Prevention for effective protection against mosquitoes that may carry the West Nile virus and related diseases.
- Note that DEET will reduce the effectiveness of Fire Resistance Clothing (FRC) and should not be applied to this clothing. If working in FRC, employees can apply DEET to their skin prior to putting FRC on, or use Permethrin as it has been shown not to reduce the effectiveness of FRC. Permethrin will need to be applied to FRC well in advance of the planned work.

#### 4.19.5 Permethrin

- When selected as part of a project's PPE requirements, the Resolution **Project Manager** shall ensure that field teams wear clothing treated with the chemical Permethrin, which is an insecticide with repellent properties registered with the U.S. Environmental Protection Agency (EPA), and recommended by the CDC. Information regarding the toxicity and product safety of Permethrin is provided in *S3NA-313-WI8 Insect Repellent Active Ingredient Product Information*. Permethrin is highly effective in preventing tick bites when applied to clothing, but is not effective when applied directly to the skin. Two options are available for Permethrin treatment of clothing worn during field work: 1) pre-treatment of fabric by the clothing manufacturer; or 2) employee treatment of their personal clothing using 0.5% Permethrin spray. Resolution strongly recommends the first option (employees obtaining pre-treated clothing) to avoid the time required, potential risk, and housekeeping issues involved with manually treating the clothing with spray. Purchase pre-treated clothing in accordance with *S3NA-208-PR Personal Protective Equipment Program* and with the approval of your **Supervisor**.
- The Permethrin pre-treatment is odorless and retains its effectiveness for approximately 25 washings. After 25 washings, the pre-treated clothing will be considered no longer effective and removed from service. Clothing that has been manually treated by employees will be considered effective for 5 wash cycles.
- Also, use of clothing that has been pre-treated with Permethrin offers a reduction in the use and application of other insect repellents that must be applied directly to the skin.. Costs for clothing shall be charged to projects as a consumable item. If charging to the project is not possible, the charges should be managed as a department expense. **Supervisor** or **Department Manager** approval is required prior to purchase.
- If an employee opts not to utilize chemically pre-treated clothing while potentially exposed to insects, spiders and/or ticks, they must either: 1) wear Tyvek® coveralls taped to the boots, 2) full length clothing consisting of long legged pants and long sleeved shirts treated with an insect repellent containing Permethrin, DEET, or an organic alternative to their work clothing.

#### 4.19.6 Manual Treatment of Field Clothing

- If clothing pre-treated with Permethrin is not available or not purchased prior to field work, employees may manually treat their clothing with Permethrin spray. The outer surfaces of all external clothing to be worn during field work should be treated with 0.5% Permethrin spray a minimum of 2 to 4 hours prior to field work (boots, trousers, shirt, jackets, rain gear; refer to Section 4.16 for selection of field clothing) in accordance with recommendations provided by the New York State Department of Health presented in *S3NA-313-WI9 New York Department of Health Recommendations for Permethrin Application*. This will likely require treatment at home or the office prior to field mobilization. Caution should be used when applying Permethrin as it is highly toxic to fish and house cats. Clothing treatment will last for approximately 5 wash cycles (check the specific instructions for the product used.)

4.19.7 Lemon Eucalyptus

- Lemon Eucalyptus is a plant-based insect repellent on the market as Repel Lemon Eucalyptus. The products have been proven to be effective against mosquitoes, deer ticks, and no-see-ums for up to six hours. Derived from Oil of Lemon Eucalyptus, this non-greasy lotion or spray has a pleasant scent and is not known to be toxic to humans. The spray or lotions will be effective for approximately two to six hours and should be reapplied every two hours to sustain protection. Lemon Eucalyptus products cannot be applied to fire retardant clothing.

4.19.8 Purchase of PPE and Repellents and Lotions

- Costs for clothing, repellents, lotions, and other PPE shall be charged to projects as a consumable item. If charging to the project is not possible, the charges should be managed as a department expense. Supervisor or Department Manager approval is required prior to purchase.
- Material Safety Data Sheets (MSDS) for the repellents, lotions, and cleansers discussed in this Procedure are not required because the repellents, lotion, and clothing are consumer products used in the manner intended for the general public. Although not required, a MSDS should be obtained for the products used and placed into the office MSDS library and site-specific health and safety plans.

4.20 **Personal Hygiene and Body Checks**

4.20.1 Tick-borne diseases typically require that the tick be imbedded for four hours to begin disease transfer. The oils from poisonous plants can take up to 4 hours after exposure to penetrate the skin and react with the live proteins under the skin.

4.20.2 It is recommended that exposed skin be checked frequently for the presence of ticks, insects, rashes, or discolorations. External clothing should also be checked for the presence of ticks and insects; these should be retained for identification and to determine if medical treatment is needed.

4.20.3 Employees will shower as soon as practical after working in the field and examine their bodies for the presence of ticks, insect bites, rashes, or swollen areas. If imbedded ticks are found, they should be removed using the technique described in *S3NA-313-W/2 Ticks*, the tick should be preserved with the date and location of the bite noted, and retained for identification if medical treatment is needed as described in Section 4.13.1 of this Procedure.

4.20.4 The presence of an imbedded tick, rash, or abnormal reactions will be reported as an SH&E Incident to the **Project Manager** or **Supervisor** who will forward the report to the RSHEM for follow up.

**5.0 Records**

None.

## **S3NA-511-PR Heat Stress**

### **1.0 Purpose and Scope**

- 1.1 Establishes a heat stress prevention program to help ensure that employees know and recognize the symptoms of heat stress-related illnesses and are prepared to take appropriate corrective action.
- 1.2 This procedure applies to all AECOM North America-based employees and operations.

### **2.0 Terms and Definitions**

- 2.1 **Acclimated:** Workers who have developed physiological adaptation to hot environments characterized by increased sweating efficiency, circulation stability, and tolerance of high temperatures without stress. Acclimatization occurs after 7 to 10 consecutive days of exposure to heat and much of its benefit may be lost if exposure to hot environments is discontinued for a week.
- 2.2 **Chemical Protective Clothing (CPC):** Apparel that is constructed of relatively impermeable materials intended to act as a barrier to physical contact of the worker with potentially hazardous materials in the workplace. Such materials include: Tyvek® coveralls (all types) and polyvinyl chloride (PVC) coveralls and rain suits.
- 2.3 **Unacclimated:** Workers who have not been exposed to hot work conditions for one week or more or who have become heat-intolerant due to illness or other reasons.
- 2.4 **Heat Cramps:** A form of heat stress brought on by profuse sweating and the resultant loss of salt from the body.
- 2.5 **Heat Exhaustion:** A form of heat stress brought about by the pooling of blood in the vessels of the skin and in the extremities.
- 2.6 **Heat Rash:** A heat-induced condition characterized by a red, bumpy rash with severe itching.
- 2.7 **Heat Stress.** The combination of environmental and physical work factors that constitute the total heat load imposed on the body.
- 2.8 **Heat Stroke:** The most serious form of heat stress, which involves a profound disturbance of the body's heat-regulating mechanism.
- 2.9 **Sunburn:** Is caused by unprotected exposure to ultraviolet light that is damaging to the skin. The injury is characterized by red painful skin, blisters, and/or peeling.

### **3.0 References**

- 3.1 S3NA-003-PR SH&E Training
- 3.2 S3NA-208-PR Personal Protective Equipment
- 3.3 S3NA-314-PR Working Alone and Remote Travel

### **4.0 Procedures**

- 4.1 **Restrictions**
  - 4.1.1 Staff working in extreme heat or sun for extended periods of time away from a shelter or vehicle must not work alone.
  - 4.1.2 Staff shall not be exposed to levels that exceed those listed in the screening criteria for heat stress exposure in the heat stress and strain section of the ACGIH Standard.

- 4.1.3 Clothing corrections shall be applied in accordance with the heat stress and strain section of the ACGIH Standard.
- 4.2 Roles and Responsibilities
- 4.2.1 Project Managers'/field task managers' responsibilities:
- Evaluate the need for heat stress prevention measures and incorporate as appropriate into the Health and Safety Plan.
  - Implement heat stress prevention measures, as applicable, at each work site.
  - Develop/coordinate a work-rest schedule, as applicable.
  - Ensure heat stress hazard assessments/evaluations were completed for the planned activities.
  - Assign personnel physically capable of performing the assigned tasks.
  - Ensure that personnel are properly trained in the recognition of heat stress-related symptoms.
- 4.2.2 Regional SH&E Managers' responsibilities:
- Provide heat stress awareness training.
  - Assist project teams develop appropriate work-rest schedules.
  - Conduct/support incident investigations related to potential heat stress-related illnesses.
- 4.2.3 Site Supervisors' responsibilities:
- Identify those tasks that may be most impacted by heat stress and communicate the hazard to the assigned employees.
  - Ensure that employees have been trained on the recognition of heat stress-related illness.
  - Ensure that adequate supplies of appropriate fluids are readily available to employees.
  - Ensure that a proper rest area is available.
  - Conduct heat stress monitoring, as applicable.
  - Implement the work-rest schedule.
  - Ensure that first aid measures are implemented once heat stress symptoms are identified.
  - Ensure personnel are physically capable of performing the assigned tasks and are not in a physically compromised condition.
  - Report all suspected heat stress-related illnesses.
- 4.2.4 Employees' responsibilities:
- Observe each other for the early symptoms of heat stress-related illnesses.
  - Maintain an adequate intake of available fluids.
  - Be familiar with heat stress hazards, predisposing factors, and preventative measures.
  - Report to work in a properly vested and hydrated condition.
  - Report all suspected heat stress-related illnesses.

#### 4.3 Controls

##### 4.3.1 If staff are or may be exposed, the supervisor shall:

- Conduct a heat stress assessment to determine the potential for hazardous exposure of workers, and
- Develop and implement a heat stress exposure control plan.

4.3.2 If staff are or may be exposed, the supervisor shall implement engineering controls (e.g., shelters, cooling devices, etc.) to reduce the exposure of staff to levels below those listed in the screening criteria for heat stress exposure in the heat stress and strain section of the ACGIH Standard.

4.3.3 If engineering controls are not practicable, the supervisor shall reduce the exposure of workers to levels below those listed in the screening criteria for heat stress exposure in the heat stress and strain section of the ACGIH Standard by providing administrative controls, including a work-rest cycle or personal protective equipment, if the equipment provides protection equally effective as administrative controls.

4.3.4 If staff are or may be exposed, the supervisor shall provide and maintain an adequate supply of cool, potable water close to the work area for the use of a heat exposed worker.

4.3.5 If a staff person shows signs or reports symptoms of heat stress or strain, they shall be removed from the hot environment and treated by an appropriate first aid attendant, if available, or by a physician.

4.3.6 Heat stress can be a significant field site hazard, especially for workers wearing CPC. The workforce will gradually work up to a full workload under potentially stressful conditions to allow for proper acclimation.

4.3.7 Site personnel shall be instructed in the recognition of heat stress symptoms, the first aid treatment procedures for severe heat stress, and the prevention of heat stress injuries. Workers must be encouraged to immediately report any heat stress that they may experience or observe in fellow workers. Supervisors must use such information to adjust the work-rest schedule to accommodate such problems.

4.3.8 Wherever possible, a designated break area should be established in an air conditioned space, or in shaded areas where air conditioning is impractical. The break area should be equipped to allow workers to loosen or remove protective clothing, and sufficient seating should be available for all personnel. During breaks, workers must be encouraged to drink plenty of water or other liquids, even if not thirsty, to replace lost fluids and to help cool off. Cool water should be available at all times in the break area, and in the work area itself unless hygiene/chemical exposure issues prevent it.

#### 4.4 Symptoms and Treatment

4.4.1 Workers who exhibit ANY signs of significant heat stress (e.g., profuse sweating, confusion and irritability, pale, clammy skin), shall be relieved of all duties at once, made to rest in a cool location, and provided with large amounts of cool water.

4.4.2 Anyone exhibiting symptoms of heat stroke (red, dry skin, or unconsciousness) must be taken immediately to the nearest medical facility, taking steps to cool the person during transportation (clothing removal, wet the skin, air conditioning, etc.).

4.4.3 Severe heat stress (heat stroke) is a life-threatening condition that must be treated by a competent medical authority.

#### 4.5 Prevention

- 4.5.1 All staff working in extreme heat or sun should understand the following guidelines for preventing and detecting heat exhaustion and heat stroke.
- If you experience heat exhaustion or heat stroke you must immediately seek shelter and water.
  - Take frequent short breaks in areas sheltered from direct sunlight; eat and drink small amounts frequently.
  - Try to schedule work for the coolest part of the day, early morning and evening.
- 4.5.2 Prevention of heat-related illnesses:
- Avoid strenuous physical activity outdoors during the hottest part of the day.
  - Wear a hat and light-colored, loose-fitting clothing to reflect the sun.
  - Avoid sudden changes of temperature. Air out a hot vehicle before getting into it.
  - If you take diuretics, ask your doctor about taking a lower dose during hot weather.
  - Drink 8 to 10 glasses of water per day. Drink even more if you are working or exercising in hot weather.
  - Avoid caffeine and alcohol as they increase dehydration.
  - If you exercise strenuously in hot weather, drink more liquid than your thirst seems to require.
- 4.6 Personal Protective Equipment
- Wear a hat and light-colored, loose-fitting clothing to reflect the sun.
  - Apply sunscreen to exposed skin (SPF 30 or greater, follow directions on label).
  - Wear sunglasses with UV protection.
  - Pack extra water to avoid dehydration (try freezing water in bottles overnight to help keep the water cooler for longer during the day).
- 4.7 Work-Rest Schedule Practices
- Intake of fluid will be increased beyond that which satisfies thirst, and it is important to avoid "fluid debt," which will not be made up as long as the individual is sweating.
  - Two 8-ounce glasses of water should be taken prior to beginning work, then up to 32 oz. per hour during the work shift; fluid replacement at frequent intervals is most effective.
  - The best fluid to drink is water; liquids like coffee or soda do not provide efficient hydration and may increase loss of water.
  - If commercial electrolyte drinks (e.g., Gatorade) are used, the drink should be diluted with water, or 8 ounces of water should be taken with each 8 ounces of electrolyte beverage.
  - Additional salt is usually not needed and salt tablets should not be taken.
  - Replacement fluids should be cool, but not cold.
  - Breaks will be taken in a cool, shaded location, and any impermeable clothing should be opened or removed.

- Dry clothing or towels will be available to minimize chills when taking breaks.
- Manual labor will not be performed during breaks, other than paperwork or similar light tasks.
- Other controls that may be used include:
  - Scheduling work at night or during the cooler parts of the day (6 am–10 am, 3 pm–7 pm).
  - Erecting a cover or partition to shade the work area.
  - Wearing cooling devices such as vortex tubes or cooling vests beneath protective garments. If cooling devices are worn, only physiological monitoring will be used to determine work activity.

#### 4.8 Evaluating the Work-Rest Schedule's Effectiveness

4.8.1 Once a work-rest schedule is established, the work supervisor must continually evaluate its effectiveness through observation of workers for signs/symptoms of heart stress. Measurement of each worker's vitals (e.g., pulse, blood pressure, and temperature) can provide additional information in determining if the schedule is adequate, and is accomplished as follows:

4.8.2 At the start of the workday each worker's baseline pulse rate (in beats per minute – bpm) is determined by taking a pulse count for 15 seconds and multiplying the result by four or an automated pulse count device may be utilized. Worker pulse rates can then be measured at the beginning and end of each break period to determine if the rest period allows adequate cooling by applying the following criteria:

- Each worker's maximum heart rate at the start of any break should be less than [180 minus worker's age] bpm. If this value is exceeded for any worker, the duration of the following work period will be decreased by at least 10 minutes.
- At the end of each work period all workers' heart rates must have returned to within +10% of the baseline pulse rate. If any worker's pulse rate exceeds this value the break period will be extended for at least 5 minutes, at the end of which pulse rates will be remeasured and the end-of-break criteria again applied.

4.8.3 Use a clinical thermometer or similar device to measure the oral/ear temperature at the beginning (before drinking liquids) and end of each break period and apply the following criteria:

- If the oral temperature exceeds 99.6°F, shorten the next work cycle by one-third without changing the rest period.
- If the oral temperature still exceeds 99.6°F (36.6°C) at the beginning of the next rest period, shorten the following work cycle by one-third.

4.8.4 Use of an automated or similar blood pressure device will be used to assess each employee's blood pressure at the beginning and end of each break period to determine if the rest period allows adequate cooling by applying the following criteria:

- If the blood pressure of an employee is outside of 90/60 to 150/90, then the employee will not be allowed to begin or resume work; extend the break period by at least five minutes, at the end of which blood pressure rates will be remeasured and the end-of-break criteria again applied.

4.8.5 All physiological monitoring of heat stress will be documented using *S3NA-511-FM Heat/Cold Stress Monitoring Log*.

4.9 Training

4.9.1 Project staff and their supervisors that may be exposed to the hazard will be oriented to the hazard and the controls prior to work commencing.

4.9.2 Those personnel potentially exposed to heat stress will receive training including, but not limited to

- Sources of heat stress, influence of protective clothing, and importance of acclimatization.
- How the body handles heat.
- Recognition of heat-related illness symptoms.
- Preventative/corrective measures.
  - Employees will be informed of the harmful effects of excessive alcohol consumption in the prevention of heat stress.
  - All employees will be informed of the importance of adequate rest and proper diet in the prevention of heat stress.
- First aid procedures for heat stress-related illnesses.

## **5.0 Records**

None.

## **6.0 Attachments**

6.1 S3NA-511-FM Heat Stress Monitoring Log

6.2 S3NA-511-WI1 Temperature Thresholds

6.3 S3NA-511-WI2 Symptoms and Treatment

6.4 S3NA-511-ST Heat Exposure

**Attachment C**  
**Task Hazard Analysis**

# Task Hazard Analysis (THA)

Activity/Work Task: <b>Preliminary Assessment</b>	Overall Risk Assessment Code (RAC) (Use highest code)	<b>L</b>	
Project Location: Kings Bay, Georgia	<b>Risk Assessment Code (RAC) Matrix</b>		
Project Number: 0888812553	<b>Severity</b>	<b>Probability</b>	
Date Prepared: 8/1/2012		Frequent    Likely    Occasional    Seldom    Unlikely	
Prepared by (Name/Title): Eric Allen/ H&S Specialist	Catastrophic	<b>E</b> <b>E</b> <b>H</b> <b>H</b> <b>M</b>	
Reviewed by (Name/Title): David Warren/ Task Order Manager	Critical	<b>E</b> <b>H</b> <b>H</b> <b>M</b> <b>L</b>	
	Marginal	<b>H</b> <b>M</b> <b>M</b> <b>L</b> <b>L</b>	
	Negligible	<b>M</b> <b>L</b> <b>L</b> <b>L</b> <b>L</b>	
<b>Notes:</b> (Field Notes, Review Comments, etc.)	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)		
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	<b>RAC Chart</b>	
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	<b>E = Extremely High Risk</b>	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	<b>H = High Risk</b>	
		<b>M = Moderate Risk</b>	
		<b>L = Low Risk</b>	
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>	<b>RAC</b>
General Physical Hazards	<ul style="list-style-type: none"> <li>Slip/Trip/Fall</li> <li>Cold/Heat Stress</li> <li>Biological Hazards</li> <li>Cuts/Scrapes/Bruises</li> <li>Manual lifting</li> </ul>	<ul style="list-style-type: none"> <li>Level D PPE required.</li> <li>Maintain a clean and organized work area.</li> <li>Watch your step and ensure proper footing.</li> <li>Provide drinking water and first aid kit.</li> <li>Wear appropriate clothing for weather conditions.</li> <li>Assess work area for poisonous plants and animals and communicate observations to avoid them.</li> <li>Wear appropriate work gloves for task.</li> <li>Maintain 3 points of contact when climbing into vehicle.</li> <li>Use proper lifting techniques by bending and lifting with legs and not back, and do not over extend or twist (Do not lift over 49lb. without assistance).</li> </ul>	<b>L</b>
	<ul style="list-style-type: none"> <li>Adverse Weather</li> </ul>	<ul style="list-style-type: none"> <li>Be aware of changing weather condition and provide appropriate weather gear.</li> <li>When work is halted due to inclement weather, personnel are to seek shelter in vehicles or building designated Shelter in Place.</li> </ul>	

Chemical Hazards and Monitoring Procedures	
Chemical Hazard(s) (list):	N/A
Applicable HASP Section(s):	N/A
Monitoring Instrument(s):	N/A

### Additional Safety Considerations

1. Ensure all personnel have read the HASP.
2. Ensure all equipment is equipped with necessary fire extinguishers (min 5 lbs BC).
3. Follow safe driving procedures. Always use the buddy system when moving vehicles. Plan your travel path ahead of time. Use maps and known construction zones to make your selection. Consult with the other team members before making any changes to travel path.
4. Use an equipment checklist to verify you have the appropriate equipment/tools for your tasks. Consult appropriate THAs or SOPs.
5. Stow all materials in vehicle properly, use appropriate cases and bags. Secure equipment in bed of truck with netting or straps. Do not leave any equipment loose in the cab or bed of the truck. It can cause property damage or serious injuries by falling from vehicle.
6. When securing equipment, watch for pinch points. Straps and netting can get caught on objects and snap back as well as trap a finger if hand placement is not correct. Use a buddy to help secure equipment when possible.
7. Maintain good housekeeping practices. When possible, use mechanical equipment to perform lifting of heavy objects. When lifting, follow safe lifting practices. Use the buddy system when lifting.

Additional Operational Safety Procedures	PPE
SH&E 313, Wildlife, Plants, Insects SH&E 509, Biological Hazards SH&E 511, Heat Stress SH&E 308, Manual Lifting, Field	LEVEL D <ul style="list-style-type: none"> <li>• ANSI approved hard hat (if overhead hazards)</li> <li>• ANSI approved safety glasses</li> <li>• Shirts with sleeves and full-length pants</li> <li>• ANSI approved steel safety-toe boots or approved equivalent</li> <li>• High visibility reflective traffic vest (if near moving vehicles)</li> <li>• Nitrile Gloves</li> <li>• Leather work gloves</li> <li>• First aid kit (located in vehicle)</li> <li>• Fire extinguisher (located in vehicle)</li> </ul>

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
None	None	None

## Acknowledgement

All employees, subcontractors, and visitors must sign the Acknowledgement form, in this section, before conducting field activities at this site.

By signing this form, Resolution Consultants employees agree that:

- I have read this Task Hazard Analysis and I understand the requirements of the THA.
- I will conduct work at this site in accordance with the requirements of the THA.

By signing this form, subcontractors and visitors agree that:

- I have read and understood the potential hazards associated with the site.
- I will ensure compliance with my company's policies on health and safety.

\_\_\_\_\_

Print Name & Company

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Print Name & Company

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Print Name & Company

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Print Name & Company

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Print Name & Company

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Print Name & Company

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Print Name & Company

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Print Name & Company

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Print Name & Company

\_\_\_\_\_

Date

\_\_\_\_\_

Signature

**Appendix B**  
**Pre-Site Visit Planning Package**



**Pre-Site Visit Planning Package  
Basewide Munitions Response Program Preliminary Assessment  
Naval Submarine Base Kings Bay, Georgia  
August 2012**

The purpose of this package is to provide an overview of the Preliminary Assessments (PA) process for Navy Military Munitions Response Program (MMRP) Ranges and Sites and to outline the data collection and research activities that are planned at your installation. This package outlines roles, responsibilities, and procedures of involved parties and identifies data elements required to meet the goals of the PA.

**Introduction and Project Objectives**

Resolution Consultants is under contract with Naval Facilities Engineering Command Southeast (Contract Number N62470-11-D-8013) to conduct a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) PA for Navy MMRP ranges and sites at Naval Submarine Base (NSB) Kings Bay, Georgia. MMRP ranges and sites are defined as other than operational ranges, which contain munitions and explosives of concern (MEC) and/or munitions constituent (MC). Other than operational ranges may include closed, transferred and transferring (CTT) ranges and sites that contain unexploded ordnance (UXO), MC, and/or discarded military munitions (DMM). For the purposes of this work plan, the term “MEC and/or MC site” will include other than operational ranges; MEC sites; CTT ranges; and sites containing MC, DMM, and UXO.

The objective of the PA is to determine if MEC and/or MC sites pose threats to human health or the environment and if so, identify if the nature of the threat is from explosive hazard, MC contamination, or both, and then set priorities for further investigation.

Furthermore, the PA is intended to provide information necessary to eliminate from further consideration those areas that pose no threat to public health or the environment; differentiate MEC and/or MC sites that may not require further action from MEC and/or MC sites that will require further investigation and/or response action; and determine if an imminent hazard is present, thus requiring an accelerated response. In addition, federal financial accounting standards require the Department of Defense (DoD) to determine the estimated cost of cleaning up the sites under the MMRP and report this cost in its annual financial statements. Findings of this PA will assist the Navy in budgeting and managing subsequent efforts.

## **PA Approach**

The PA will consist of a limited-scope investigation, including the collection and review of historical records, supplemental data collection and visual observations made during follow-up site visits, if warranted, and associated reporting. The PA will use data from previous environmental investigations, archival records, interviews, and visual observations to identify areas of concern (AOCs) and assess risks, with respect to MEC and/or MC.

The process will include the following components:

1. Development of a work plan to provide details on project approach, management, methodology, reporting, schedule, quality assurance, and health and safety
2. Review of archival records available at local, national, Navy, and DoD archives
3. Collection and review of relevant data maintained at the installation level
4. Visual site reconnaissance at AOCs (suspected MEC/MC sites), as identified during data collection
5. Data review/analysis to determine historical uses, potential risks, and prioritization/need for response action
6. Preparation of PA Report to document findings

The following are key terms that will be utilized during the PA process:

**Closed Range** — A Military Range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a DoD component. Closed ranges cannot occupy an area that has been identified as an active or inactive range. Closed ranges are those areas of land that used to be active/inactive ranges, and are still owned by the Navy/DoD, but are now used for non-range purposes.

**Defense Site** — All locations that are or were owned by, leased to, or otherwise possessed or used by the DoD. The term does not include any operational range, operating storage, or manufacturing facility, or facility that is used for or was permitted for the treatment or disposal of military munitions.

**Discarded Military Munition** — A military munition that has been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal (does not include items that are being held for future use or planned disposal or items that have been properly disposed of consistent with applicable laws and regulations).

**Explosives and Munitions Emergency Response** — All immediate response activities by an explosives and munitions emergency response specialist to control, mitigate, or eliminate the actual or potential threat encountered during an explosives or munitions emergency. An explosives or munitions emergency response may include in-place, render-safe procedures, treatment or destruction of the explosives or munitions, and/or transporting those items to another location to be rendered safe, treated, or destroyed. Any reasonable delay in the completion of an explosives or munitions emergency response caused by a necessary, unforeseen, or uncontrollable circumstance will not terminate the explosives or munitions emergency. Explosives and munitions emergency responses can occur on either public or private lands and are not limited to responses at Resource Conservation and Recovery Act facilities.

**Military Munitions** — All ammunitions products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and device and components thereof.

**Military Range** — Designated land and water areas set aside, managed, and used to conduct research on, develop, test, and evaluate military munitions and explosives, other ordnance, or weapons systems, or to train military personnel in their use and handling. Ranges include firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, and buffer zones with restricted access and exclusionary areas.

**Munitions and Explosives of Concern** — Military Munitions that are UXO or abandoned or discarded; soil with high enough concentrations of explosives to present an explosive hazard; or facilities, equipment, or other materials contaminated with a high enough concentration of explosives such that it presents an explosive hazard.

**Munitions Constituents** — Any materials that originate from UXO, DMM, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

**Operational Range** — A military range that is used for range activities, or a military range that is not currently being used, but that is still considered by the Secretary of Defense or the Secretary of a military department to be a range, is under the jurisdiction, custody, or control of the DoD or of a military department, and has not been put to a new use that is incompatible with range activities.

**Site** — A “site,” as defined by CERCLA, is an area consisting of the aggregation of sources, the areas between the sources, and areas that may have been contaminated due to migration from sources; site boundaries are independent of property boundaries.

**Source** — An area where a hazardous substance may have been deposited, stored, disposed, or placed; and soil that may have become contaminated as a result of hazardous substance migration.

**Transferred Range** — A Military Range that is no longer under military control and had been leased by DoD, transferred, or returned from DoD to another entity, including Federal entities. This includes a Military Range that is no longer under military control, but that was used under the terms of an executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the

Federal land manager. Additionally, property that was previously used by the military as a range, but which did not have a formal use agreement, also qualifies as a transferred range.

**Transferring Range** — A Military Range that is proposed to be leased, transferred, or returned from the DoD to another entity, including Federal entities. This includes a Military Range that was used under the terms of a withdrawal, executive order, special-use permit, or authorization, right of way, public land order, or other instrument issued by the Federal land manager or Property Owner. An active range will not be considered a “transferring range” until the transfer is imminent (generally defined as the transfer date is within 12 months and a receiving entity has been identified).

**Unexploded Ordinance** — Military munitions that have been primed, fused, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and remain unexploded either by malfunction, design, or any other cause.

### **Initial Site Visit**

An initial site visit has been scheduled for the week of \_\_\_\_\_ through your point of contact (POC). A team of two to four data collectors under the supervision of a designated Data Collection Team Leader will conduct the site visit. The team leader will be responsible for all actions of the research team while on your installation and serve as the primary POC. The visit will be structured through an itinerary to be coordinated with your installation POC.

At a minimum, the site visit will include:

- Kick-off Meeting — Attended by installation personnel, as deemed appropriate by installation POC
- Personnel Interviews with individuals familiar with installation history and/or potential MEC/MC (Historians, Environmental, Facilities, Engineering, Range Officers, Explosive Ordnance Disposal [EOD], etc.)

- Review of Records- Specific offices and relevant organizations to be researched may include Real Estate, Installation Historian/Museum, Range Officer, EOD, Engineering, Environmental, Public Works, and Public Affairs
- Obtain Base Maps and Coverages
- Exit Briefing — Report findings and coordinate subsequent efforts for resolution of any data gaps/discrepancies and site reconnaissance

During the site visit, the project team will gather information from multiple sources, verify and review these data, and coordinate results based on installation input. The data collection teams are required, at a minimum, to determine the following for each suspected MEC/MC site:

- History and boundaries
- Past/present/future landuse
- Physical/environmental setting
- Types and estimated quantities of munitions used
- Types and locations of any targets
- Results of previous investigations
- Nearby populations (human)
- Nearby ecological receptors

As information is gathered, the team leader will update the installation POC regarding progress. Installations are not required to provide any funding to support the PA effort. However, the installations are requested to provide the following:

- Identify POCs and data sources for the required information
- Access to various facilities and personnel, as needed
- Access to historic records at various repositories across the installation, including environmental, facilities, range control, EOD and other relevant offices

- Ability to make copies of all pertinent records and to return the originals upon site departure
- Mapping/Geographic Information System coverage, as necessary

### **Follow-up Site visit**

Following review of data obtained during initial collection efforts, a follow-up site visit, under a separate mobilization, may be necessary to address any data gaps. Similar to the previous visit, the follow-up site visit would be coordinated with the installation POC.

### **Site Reconnaissance**

Once sufficient data is collected and reviewed, a site reconnaissance will be coordinated with the installation POC to occur during a separate mobilization. During the site reconnaissance, suspected MEC and/or MC sites will be visually inspected through a surface walk-over to identify materials and/or surface features that provide information on the areas and activities in question. Areas to be inspected will be mutually agreed upon between Resolution Consultants, the Restoration Program Manager (RPM), and the installation POC. Visible indicators of MEC/MC use may include physical depressions, indicative of former open burn and open detonation areas and potential burial trenches and/or pits. Areas that lack vegetation and/or eroded areas with obvious signs of exposed metallic items may indicate the presence of ordnance materials. More obvious signs may include actual UXO items on the surface, fragmentation, craters, bomb and projectile entry holes, vegetation damage, and ordnance-related range residue. If any live and/or suspected live UXO are encountered during the site reconnaissance, the location of the material will be marked and the activity POC will be immediately notified so that the Navy can take steps to determine if an immediate response is required. A Global Positioning System unit will be used to record coordinates of notable features/observations, and, if permitted, such features will be documented with a digital camera. In addition, a limited handheld magnetometer survey may be performed for avoidance purposes only.

### **Reporting**

**Resolution Consultant's Task Order** Manager (TOM) shall oversee the preparation of the PA Report. The draft documents will be submitted to the **Navy's** RPM and to the installation POC for review and validation. Tentative document submission and review schedules will be discussed at the time of the initial site visit.



### **Navy Points of Contact**

Navy RPM — Mr. Brian Syme, [brian.syme1@navy.mil](mailto:brian.syme1@navy.mil), (904) 542-6151

Navy Deputy Project Manager — Mr. Dana Hayworth, [dana.hayworth@navy.mil](mailto:dana.hayworth@navy.mil), (904) 542-6417

Installation POC — Mr. Thomas Stofflet, [thomas.stofflet@navy.mil](mailto:thomas.stofflet@navy.mil)

### **Resolution Consultants Points of Contact**

TOM — Mr. David Warren, [dwarren@ensafe.com](mailto:dwarren@ensafe.com), (843) 323-1682

Data Collection Team Leader — Ms. Kara Wimble, [kwimble@ensafe.com](mailto:kwimble@ensafe.com), (904) 716-8184

Safety Officer — Mr. Steve Skipper, [sskipper@ensafe.com](mailto:sskipper@ensafe.com), (904) 367-4324